

# INSTRUCTION MANUAL

*TO BE KEPT FOR FUTURE REFERENCE*

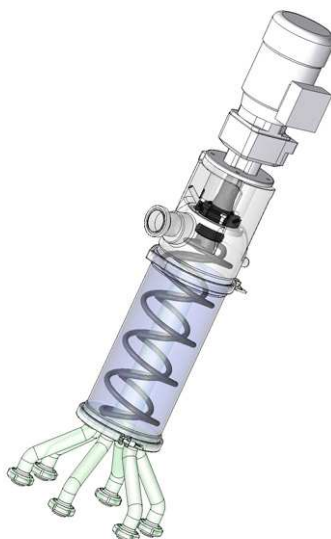
## ***PCM – DOSYMIX™***

*Series*      **DM**

*Type*        DM1000 – DM2000 – DM4000 – DM8000

*Serial No.*

*Year of manufacture*



*Reference:*

***NIDMDX02EN***

*Date approved: December 2009*

*Date issued: December 2009*



## **DECLARATION OF INCORPORATION**

We declare that the subassembly described in the technical description cannot be put into service until the machine in which it is to be incorporated has been declared compliant with the provisions of machine directive 98/37/CE modified 98/79/CE and with the related national legislation.

The subassembly complies with harmonised standards EN ISO 12100.

Vanves, 28/07/2005

For company – NAME and FUNCTION  
Director

Innovation

Luc Chatelain



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- Automation (optional)



## 0. INTRODUCTION

### 0.1 General information

The mixer you have purchased has been manufactured and checked with the utmost care.

This manual aims to help you keep your mixer in good working order.

The information contained in this manual may not be copied or published in any form whatsoever, whether by printing, photography, recording on microfilm or any other means (electronic or mechanical) without the prior written consent of *PCM SA*.

The information given in this document is subject to change without notice. PCM SA or its representatives decline all responsibility in the event of damage resulting from the use of this manual. This exemption from responsibility applies to damage of all types, including (without any limit) compensatory damages, whether direct or indirect, loss of data, profits or return of capital, loss or damage caused to the property of others, and third-party claims. PCM SA or its representatives accept no responsibility and do not guarantee the accuracy, completeness, or up-to-date nature of the information contained in this manual.

### Markings

Electrical information is shown on the mixer drive unit. On the spacer (bell), there is a nameplate showing the following data:

- a) Manufacturer name and address.
- b) Serial number.
- c) Rotation speed of mixer drive.
- d) Maximum allowable internal pressure
- e) Customer reference (optional).

This information is essential when ordering spare parts (contact **PCM Services**).



**Mixer characteristics (e.g. pressure, speed of rotation, construction, etc.) must not be modified without written permission from PCM Services.**



**The mechanical seal does not tolerate dry running**



## 0.2 Limits of Guarantee



**Before performing any servicing on the mixer, please check that all necessary precautions have been taken: mixer switched off, upstream and downstream valves closed, pipework cleaned and purged, electrical power supply disconnected, and all the usual steps to be applied according to the personnel safety regulations in force.**

On receiving the equipment, examine it immediately to check that it shows no obvious sign of damage. If it is visibly damaged, write a clear annotation on the carrier's documents stating that the merchandise was received damaged and briefly describing the nature of the damage. If you decide to accept such equipment, send a registered letter with return receipt, to reach the carrier within forty-eight hours, with a copy to **PCM Services**.

Handling and storage conditions are given in detail in Section 3, Para. 3.2 and 3.3.

To prevent any risk of accident or damage (in particular, when hazardous products are being blended), it is essential to refrain from using this equipment for an application other than the one originally intended (refer to technical description in Appendix).



**To maintain the original qualities of the mixer and to preserve the PCM guarantee on the equipment as well as compliance with the machines directive and food standards, it is essential to use PCM parts only.**

## 0.3 Safety and Environment

PCM is committed to an environmental protection initiative in accordance with the recommendations of the ISO 14001 standard.

PCM has set up a system through which its customers can ask PCM to handle the disposal of waste material (used mixers and spare parts).

All returns must be sent to the PCM factory, carriage paid. The equipment must be clean, with the mixer and drive completely emptied of products, and must arrive with the sheet entitled: **risk prevention** (see Section 4: Appendices).

All items returned for this purpose must be legibly marked with the words '**Equipment to be recycled**'.

Send to:

**PCM**

**Rue René Moineau**

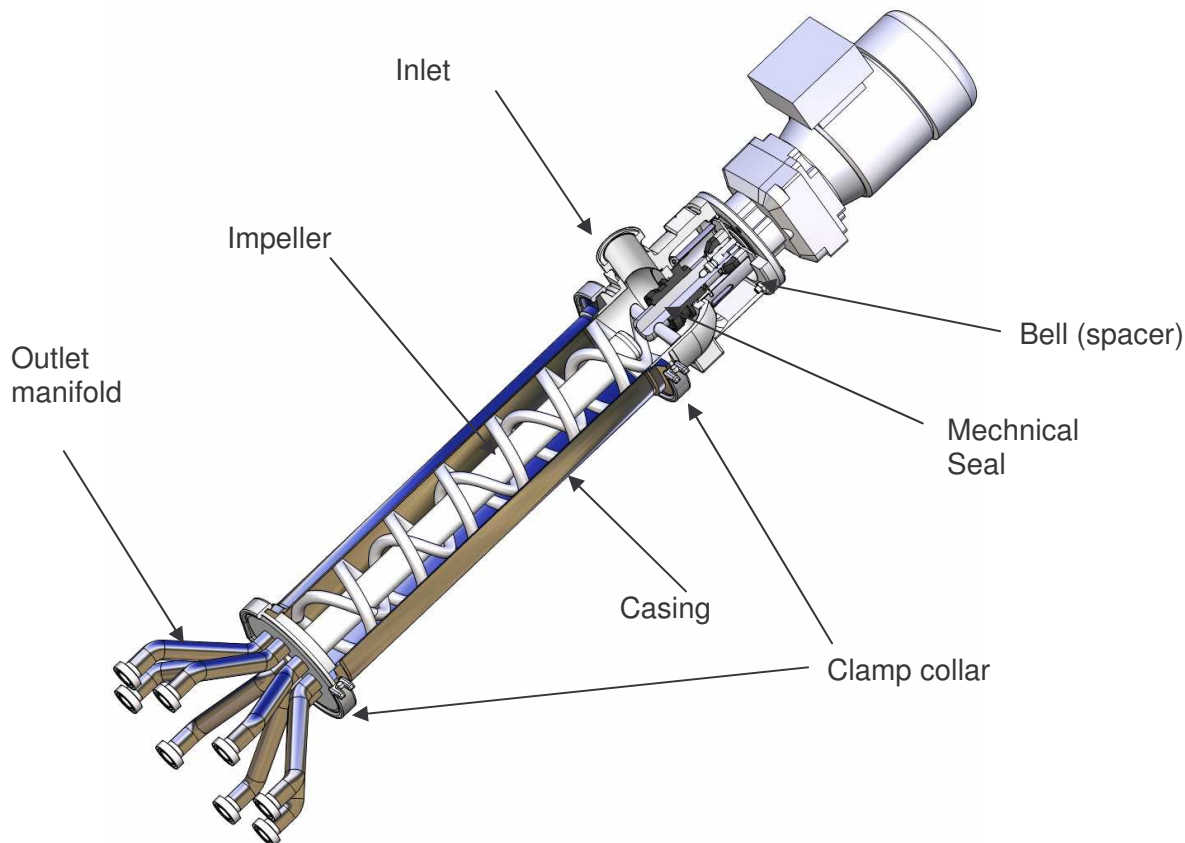
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**FRANCE**



## 1. SPECIFICATIONS AND INSTALLATION

### 1.1 Operating principle



The **DOSYMIX™** is a continuous dynamic mixer.

The moving part consists of two coils with opposite “thread” welded together to a shaft.

The co and counter circulation derived from the rotation of the shaft produces a uniform and gentle mixing action for delicate products.

Circulation through the mixer is generated externally (e.g. pumps) as the rotation of the moving part does not generate flow. The mixing is a result of the combined upward and downward flows generated by the rotation of the impeller.

The mixer is fed in from the inlet (top side) and the blended product is discharged through the outlet manifold (bottom side)

Various solutions for the injection of the base and additive:

- Continuous injection of base and additive in pulsed mode.
- Continuous injection of base and additive in continuous mode.
- Injection of base in pulsed mode and additive in pulsed mode.







## 1.2 Specifications

### 1.2.1 Build specifications

Build specifications are given in the table below.

<b>DOSYMIX™ dynamic mixer</b>		
<b>Parts</b>	<b>Material</b>	<b>AFNOR designation</b>
Helix:	Stainless steel 316L	X2CrNiMo17-2-2
Mechanical seal friction faces	Carbide/Carbide Refer to specific sealing manual	
Bell	Stainless steel 316L	X2CrNiMo17-2-2
Seals: Casing Mechanical seal	FKM (3A std.18 compliant) Refer to specific sealing manual	
Casing:	Stainless steel 316L	X2CrNiMo17-2-2
End connections	Must comply with 3A Standard 63-03	

The designation of the stainless steel material complies with the **AFNOR** standard.

	 <b>DM1000</b>	 <b>DM2000</b>	 <b>DM4000</b>	 <b>DM8000</b>
Internal capacity (litres)	3.80	8.00	17.00	23.00
CIP rate (m3/hr)	13	13	22	30

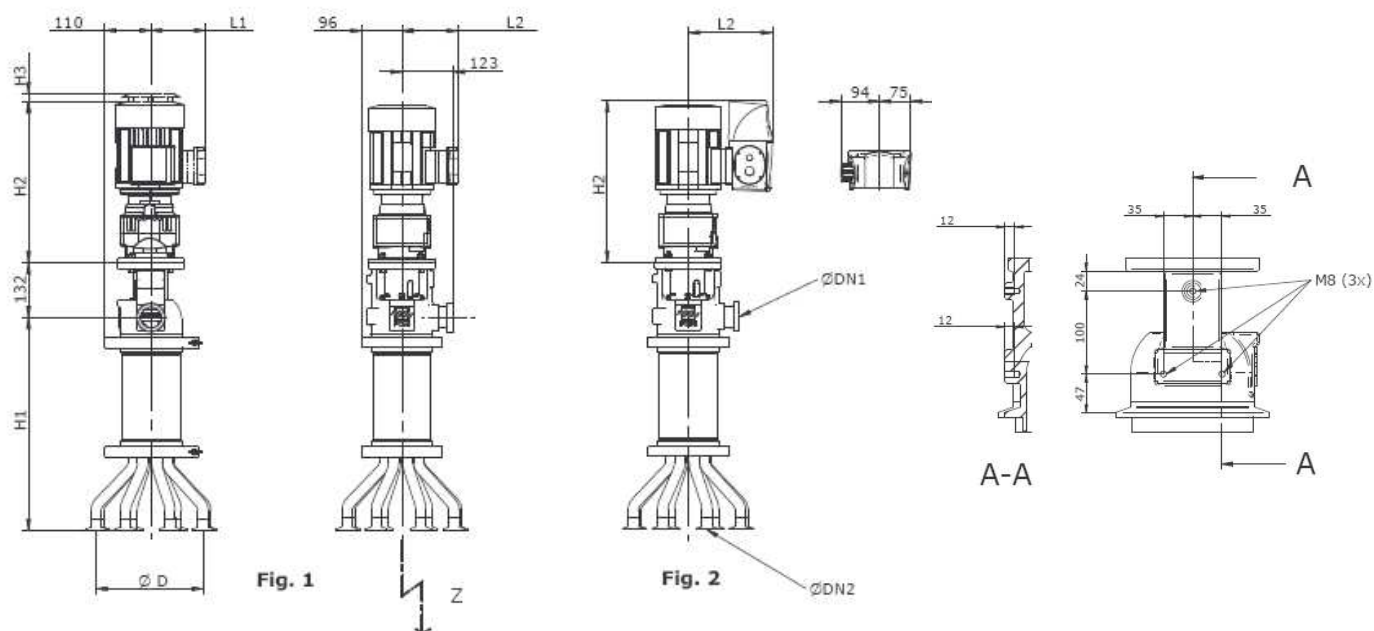
The shapes and interior finish of the **PCM DOSYMIX™** ensure simple and quick in-line cleaning

PCM Dynamic Mixers fitted with a mechanical sealing system, a stainless steel helix, a stainless steel casing, a stainless steel inlet casting meet the food quality and hygiene criteria of the entire food-processing industry provided connections (DIN11851, DIN11864-1 , CLAMP) are fitted with appropriate gaskets (consult Manufacturer for details).



## 1.2.2 General dimensions

### DM1000 and DM2000

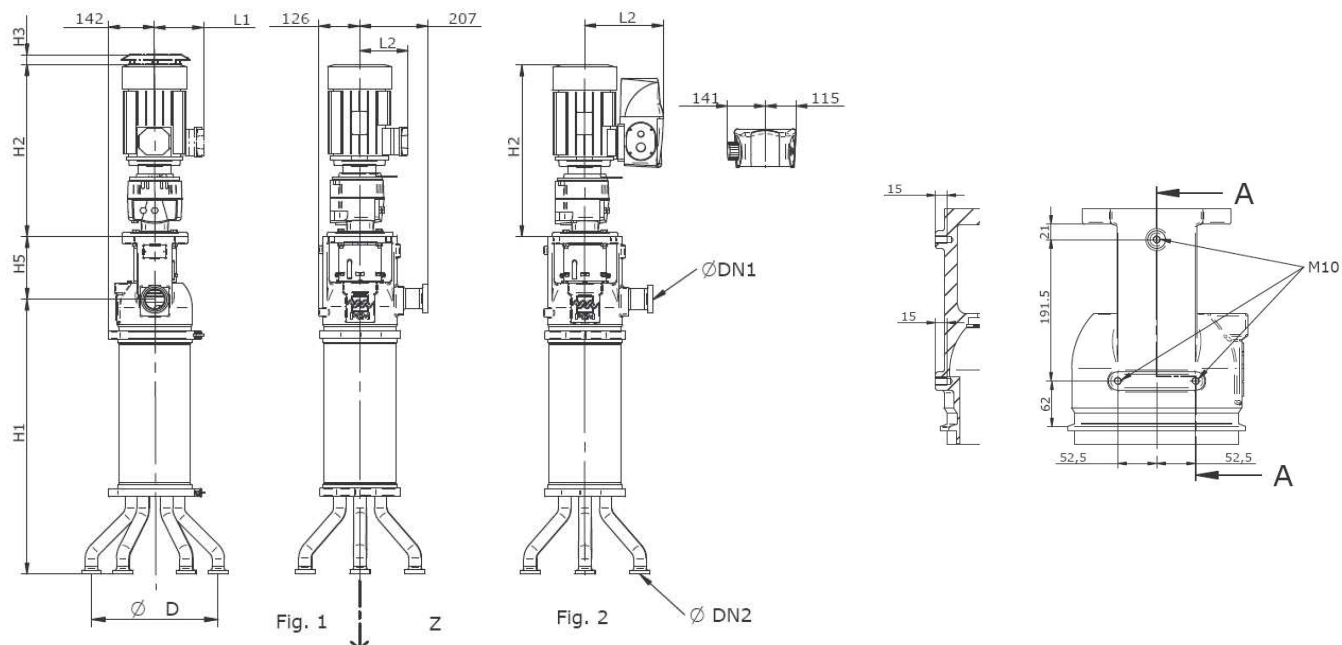


Maximum dimensions (mm)									
Number of outlet connections		1		2		3 +			
Ø DN2		Ø51		Any		Ø25		Ø38	
		H1	D / 2	H1	D	H1	D	H1	D
Mixer	DM1000	482	42	442	89	523	278	570	332
	DM2000	834	42	794	89	875	278	922	332

Mixer		Maximum dimensions (mm)						
		Ø DN1	L1	L2	H2	H3	Z	Weight (kg/lbs)
DM1000	Fig.1	Ø51	147	208	414	20	270	47 / 104
	Fig. 2	Ø51	205	252	382	-	270	51 / 113
DM2000	Fig.1	Ø51	147	208	414	20	620	53 / 117
	Fig. 2	Ø51	205	252	382	-	620	57 / 126



## DM4000 and DM8000



Maximum dimensions													
Number of outlet connections		1				2		3 +					
Ø DN2		Ø63.5		Ø76		Any		Ø25		Ø38		Ø51	
		H1	D / 2	H1	D / 2	H1	D	H1	D	H1	D	H1	D
Mixer	DM4000	715	72.5			715	145	792	334	840	388		
	DM8000			1005	69	910	145	987	334	1032	388	1016	316

Mixer		Maximum dimensions							
		Ø DN1	L1	L2	H2	H3	H5	Z	Weight (kg/Lbs)
DM4000	Fig. 1	Ø63.5	154	154	509	20	191.6	500	90 / 200
	Fig. 2	Ø63.5	270	262	563	-	191.6	500	94 / 207
DM8000	Fig. 1	Ø76	166	166	527	25	198	700	107 / 236
	Fig. 2	Ø76	280	270	651	-	198	700	119 / 262

For special applications for which it is recommended to maintain the temperature of the pumped fluid, PCM offers heating/cooling jacket bodies on request.



### 1.2.3 Operating specifications



**The characteristics of the mixer (rate, pressure, rotation speed, construction etc.) should not be modified without the written consent of our customer service department.**

#### 1.2.3.1 Mixer

##### During production:

Internal Working Temperature: 90°C max. in production mode

Rotation speed: 145 rpm or 300 rpm (fixed speed)

60 to 300 rpm (variable speed)

Maximum operating pressure: 10 barg

##### Cleaning in Place (CIP) (see also the Cleaning section)

Max Allowable Pressure: 3 barg max.

##### Sterilization in Place:

140°C max. for 5 mins in static mode (impeller not rotating)

Max Allowable Pressure: 3 barg max.



**Warning : after sterilizing the equipment, it is compulsory to let the temperature decrease to acceptable working temperature before starting the equipment**

Operating specifications are given in the technical description for the supplied equipment. The equivalent continuous A-weighted sound pressure level for PCM equipment is less than 70 dB(A).

#### 1.2.3.2 Mechanical Seal

Refer to the specific manual on sealing



## 1.3 Equipment installation

### 1.3.1 Installation precautions

#### 1.3.1.1 Precautions before connecting the mixer:

**DOSYMIX™** mixers are designed to operate vertically with the gear motor in the top position and fixed onto existing support structure (stand alone support frames are available on request).

The following is recommended:

- Arrange for the products to be mixed to be introduced from the top, thereby providing natural drainage at the end of production.
- Arrange for the external helix to rise when rotating.
- Level the mixer out before connecting up the utilities (water, electricity).
- Plan for an access area for machine control and maintenance (c.f. general drawings for vertical clearance).
- Check that the different constituent elements of the machine are correctly fastened.
- Avoid assembling the mixer in places where the ambient temperature is incompatible with the maximum working temperature.

#### 1.3.1.2 Recommendations for in place cleaning and sanitization of the mixer



**The purpose of sanitation is to reduce microorganisms to acceptable levels. This is performed by a heat treatment or chemically with disinfectants.**

The sanitation and CIP systems were developed by the dairy industry in the 1950s with a view to reducing cleaning times.

Today and for applications such as dairy products, these systems have virtually replaced manual cleaning. They can be separate or combined.

Cleaning in place has three objectives:

1. To remove organic matter (sugar, protein, fat etc).
2. To remove mineral matter.
3. To reduce the number of micro organisms.

Example of a cleaning in place procedure:

1. Rinsing with cold water to remove deposits.
2. Alkaline detergents e.g. caustic soda (concentration of 2~3%) at 80~85°C for approximately 20 minutes to remove the organic matter.
3. Intermediate rinsing with water.
4. Acid detergents, e.g. HNO<sub>3</sub> (concentration of 1~2%) at 70~75°C for approximately 10 minutes to remove the mineral matter.
5. Final rinsing.

Phases (2) and (4) can be combined by using a product that is both an organic solvent and a de-scaler.



### 1.3.2 Pipework connection

Model	DM1000		DM2000		DM4000		DM8000		
Inlet									
1 off.	SMS 51* Clamp 51 DIN50		SMS 51 Clamp 51 DIN50		SMS 63 CLAMP 63 DIN65		SMS 76 CLAMP 76 DIN80		
Outlet									
1 off.	SMS 51 Clamp 51 DIN50		SMS 51 Clamp 51 DIN50		SMS 63 CLAMP 63 DIN65		SMS 76 CLAMP 76 DIN80		
2 .off	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS DN38 Clamp 38 DIN40	SMS DN25 Clamp 25 DIN DN25	SMS DN38 Clamp 38 DIN DN40	SMS 51 Clamp 51 DIN DN50
3 .off	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS DN38 Clamp 38 DIN40	SMS DN25 Clamp 25 DIN DN25	SMS DN38 Clamp 38 DIN DN40	SMS 51 Clamp 51 DIN DN50
4 .off	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS DN38 Clamp 38 DIN40	SMS DN25 Clamp 25 DIN DN25	SMS DN38 Clamp 38 DIN DN40	SMS 51 Clamp 51 DIN DN50
5 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS DN38 Clamp 38 DIN40	SMS 51 Clamp 51 DIN DN50
6 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	SMS 25 Clamp 25 DIN25	SMS DN38 Clamp 38 DIN40	SMS 51 Clamp 51 DIN DN50
7 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	
8 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	
9 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	
10 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	
11 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	
12 .off	SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25		SMS 25 Clamp 25 DIN25	SMS 38 Clamp 38 DIN40	

\* Note: SMS connections are available but do not comply with 3A Standard 63-03



### 1.3.3 Anchoring / Supporting

The Dosymix™ mixers are designed to be mounted on existing structures or skids. Refer to the 'General dimensions' section for anchoring footprint.

Specifically designed skids are available upon request.

In order to maintain the overall compliance of the equipment, the following guidance shall be applied:

- If legs are used, they shall be smooth with rounded ends or with a flat, load-bearing foot suitable for sealing to the floor, and have no exposed threads.
- Legs made of hollow stock shall be sealed.
- Legs shall provide a minimum clearance between the lowest part of the base and the floor of not less than 100 mm (4.0 in.) when the blending equipment outlines an area in which no point is more than 305 mm (12.5 in.) from the nearest edge of the base.
- When any point is more than 305 mm (12.5 in.) from the nearest edge of the base, the clearance shall be 152 mm (6.0 in.)
- If casters are used, the minimum distance between the floor and the lowest part of the base shall be 101mm (4.0in.).

**For further information, please refer to 3-A Sanitary Standards for Blending Equipment, Number 35-02.**

### 1.3.4 Motor drive connections



**Caution! All procedures must be performed by qualified personnel. PCM declines all responsibility if this requirement is not fulfilled. Before performing any connections, ensure that the electrical power supply has the characteristics listed on the motor plate. There is also a connection diagram in the motor terminal box (instructions in Appendix).**

For thermal protection: the setting is the current indicated on the motor plate.

After making all connections (three-phase), start the mixer **for a few seconds** (at minimum speed if possible using frequency variator, mechanical or hydraulic) and check helix rotation direction.



**Caution! Don't forget to earth the mixer (yellow and green wire).  
The mechanical seal does not tolerate dry running**



## 2. OPERATION

### 2.1 First Commissioning

#### 2.1.1 Before Start-up



**Remove any packaging in the mixer (shaft and helix protection).**

Check the following points:

- The mixer is vertical (gearmotor on top).
- The reducer has been filled with lubricant or that its level is correct. (Check gearmotor manual for additional information).
- Venting plug is present on reducer.
- Presence of fluid inside mixer casing.
- Presence of fluid in the hydraulic barrier of the mechanical seal (if applicable). Please refer to mechanical seal manual for further information
- Upstream and downstream valves are open.

#### 2.1.2 Start-up



**Do not operate the DOSYMIX™ when empty and without water circulating in the hydraulic barrier circuit.**

- Product entering and circulating in the upward or downward direction within the mixer.
- Shaft rotation direction is correct.
- N.B. Preferred direction of rotation: exterior helix 'rising' if flow is descending and vice versa if flow is ascending.
- Temperature of pumped fluid within operational limits

#### 2.1.3 General operating requirements

It must be ensured that the following conditions are met:

- The mixer is permanently supplied with the fluid to be mixed and power.
- Compliance with applicable process operating instructions for the production site.



## **2.1.4 Cleaning**

### **2.1.4.1 External cleaning**

Remove any soil which may drain, drop, diffuse or be drawn into the product.

### **2.1.4.2 Internal cleaning**

#### **a) Dairy applications**

The cleaning procedures and frequency depend on mixer use and product mixed. For dairy applications, the minimum CIP procedure consists of the following:

- Traditional dairy type CIP: the mixer runs when the CIP solution is delivered and does not when there is no solution.
- The CIP rate is equivalent to the rate required by the Dosymix™ connection hose. Flow velocity at 2 m/sec.
- Option to sanitize or sterilize the mixer (machine switched off), max. 140 °C for 5 min.

#### **b) Other applications**

In other applications (fibrous or sticky products specifically), it is advisable to dismantle the equipment to manually clean the Product Contact Surfaces. This can be achieved by using simple hand tools and by following the disassembly procedure given in this manual.

Soil removal should be effected with chemical solutions and water rinses with the assistance of one or a combination of brushes; non metallic scouring pads and scrapers, high or low pressure hoses and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hands.

After cleaning, a visual inspection should be carried out to ensure satisfactory cleaning followed by the re assembly of the equipment in accordance with the procedure given in this manual.

## **2.2 Operating procedure in the event of an incident**

In the event of operational anomalies such as:

- Mixer does not start.
- Irregular flow mixing.
- Mixer stops.
- Mixer abnormally noisy.

Proceed as follows:

- Stop the mixer.
- Hydraulically isolate the mixer (inlet, outlet).
- Refer to the Troubleshooting section.

## **2.3 Automation**

It is recommended to use devices which automatically authorize or interlock pump/mixer operation. For example, valves with electrical contacts for position, dry operation interlock sensor (capacitance sensor).

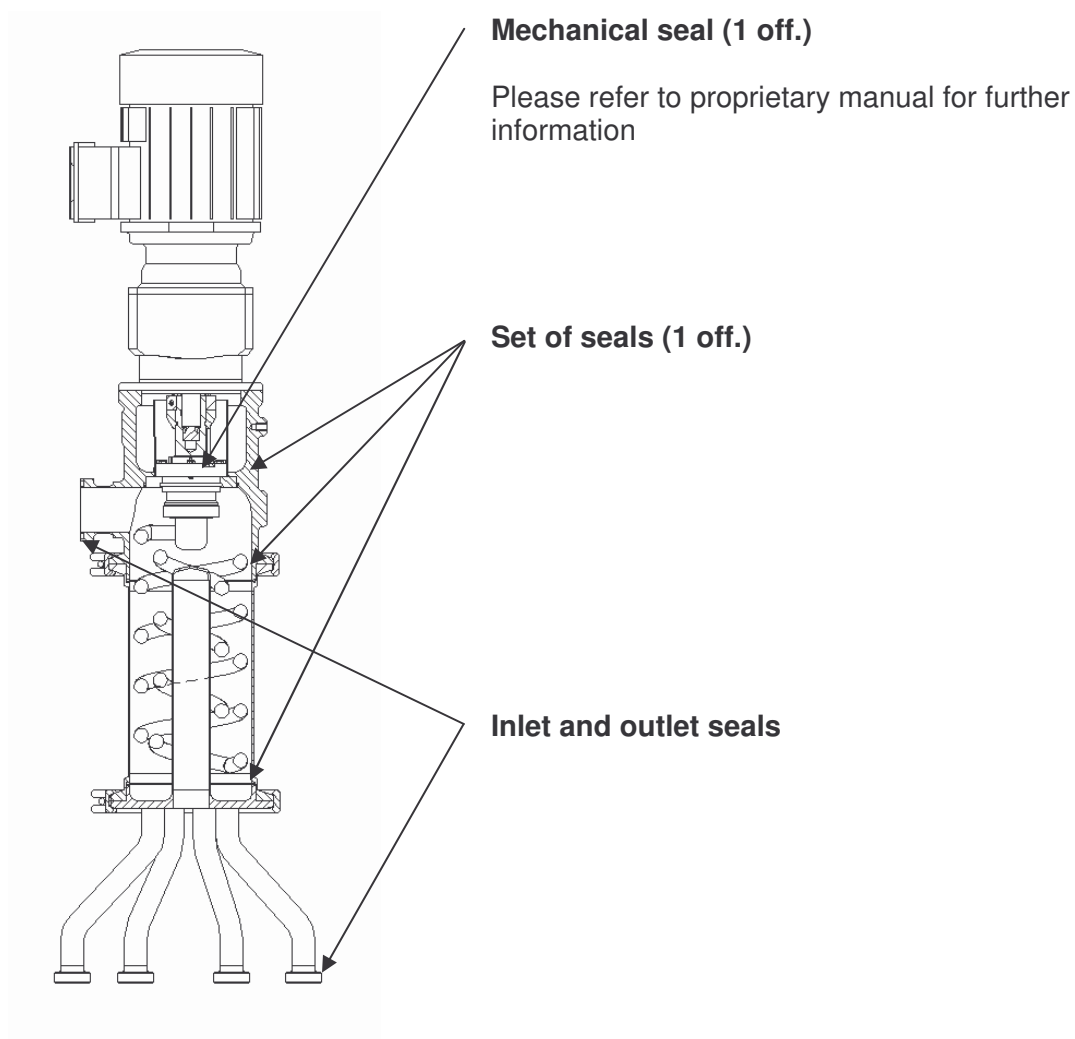




### 3. MAINTENANCE

#### 3.1 List of spare parts

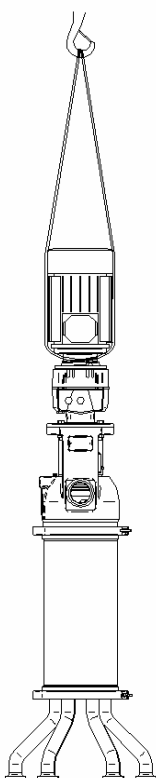
The list of spare parts for your mixer can be obtained by contacting our Customer Service Department and communicating the serial No. of your equipment (see Section 0.1) which can be found on the manufacturer's plate.



## 3.2 Handling equipment and procedure



**To handle the complete mixer, refer to the procedure in force and comply with legislation concerning the safety of personnel. Slings must be performed by trained, qualified personnel in accordance with the instructions given in this manual. Any failure to observe this rule releases PCM from all responsibility.**



Before lifting the mixer, ensure that all its components are securely fastened to each other. Do not sling with a single sling or an endless sling that can slip on the lifting hook.

Use two single slings working in a slipknot type loop between the motor and the reducer with an adequate CMU\* (Maximum allowable mass (kg) that can be hung vertically from the sling in normal use). Use a lining to protect the slings from sharp edges and a protective thimble or a sliding hook where the loop is situated. The mixer unit maximum loads are given in Para. 1.2.1.1.

Lift slowly the mixer making sure the hook is kept in line vertically with the centre of gravity of the mixer to prevent the equipment from tilting.

Mixer parts that cannot be handled manually can be lifted using a hoist and sling (or other similar lifting equipment).

Metallic slings (chain, cable, etc.) are not recommended.

Fragile parts, notably the mechanical seals, should be handled with particular care in order to avoid falls or impact. After dismantling, they should be placed on a flat and sound surface with no risk of impact.

## 3.3 Storage conditions

A) In standard PCM packing:

Mixer parts must be stored in their original packing, in a stable manner, protected from shocks and in a dry room

B) After unpacking:

Protect equipment from shocks and dust

C) When packed according to S.E.I. 4c:

Every six months:

- Change the dessicator bags
- Check machined surfaces and grease as necessary
- Close the cover hermetically
- Once a month:
- Turn the mixer by 4 to 5 turns using the fan



## 3.4 Preventive maintenance



**All maintenance procedures must be performed by trained, qualified personnel in compliance with the instructions given in this manual.**

**Any failure to observe this rule releases PCM from all responsibility.**

**Before performing any servicing on the mixer, please check that all necessary precautions have been taken: mixer switched off, internal pressure released, upstream and downstream valves closed, pipes cleaned and purged, electrical power supply disconnected and made inaccessible. All the usual precautions must be taken, in accordance with the texts in force regarding the safety of personnel.**

An inspection of the mixer is necessary after 300 hours. This inspection consists of the complete disassembly of the mixer and a check of the condition of the wear parts. If no significant wear is observed on initial disassembly, the inspection intervals can be increased to 500 hours.

### 3.4.1 Periodic inspection

- The tightness of the mixer connections: Inlet and Outlet.
- Tightness between casing, bell and outlet manifold.
- The tightness of the assembly's fixing nuts and screws.
- The drive unit lubricant level, if applicable.
- The fixing elements to the structure.
- The motor current and cleanliness of the drive unit fan inlets.
- The condition of the electrical cladding.

### 3.4.2 Lubrication

The mixer drive is supplied with oil. Check the oil level before putting the mixer in service.

Consult the manufacturer documentation supplied in Appendix for the precautions to be taken when lubricating the drive, where applicable.

### 3.4.3 Torque values

The torque values for the securing screws is defined in the table below:

Diameter of mounting hardware	Min. torque	Max. torque
M5	1.8 Nm	3.3 Nm
M6	3.1 Nm	5.6 Nm
M8	7.4 Nm	13 Nm
M10	15 Nm	27 Nm
M12	30 Nm	45 Nm
M14	52 Nm	74 Nm
M16	61 Nm	110 Nm



### 3.5 Corrective maintenance



**This machine contains parts that can be dangerous under some conditions: Whenever the inlet or outlet pipes are removed, it is particularly dangerous to insert your fingers into the housing of the mixer.**

#### 3.5.1 Troubleshooting

Causes	Incident									Solution (see paragraph 3.5.1.1)
	The mixer does not start.	Mixer stops running.	Drive is overloaded	mixer is noisy or vibrates	Leak from casing	Leak from the upper part of the mixer (bell spacer)	Leak from the connection	Mixing is not regular	seals deteriorate quickly	
Product temperature is out of range.	x	x	x	x	x	x	x	x	x	1
Sedimentation or precipitation of the fluid in the mixer casing	x	x	x	x				x	x	2
The solid bodies contained in the liquid are too voluminous.	x	x	x	x					x	3
The electrical installation is not compliant.	x	x	x	x						4
The devices driving the mixer are worn or broken.	x	x		x				x		5
Mixer is blocked by a foreign body.	x	x	x						x	6
Leak in mechanical seal.						x				7
Retention time within the mixer is incorrect								x		8
Mixer installation location, pipework and accessories should all be checked.	x	x	x	x	x	x	x	x	x	9
The mixer is running dry.				x					x	10
Viscosity of the pumped product is higher than expected.	x	x	x					x		11
Pressure is too high.	x	x	x	x	x	x	x		x	12
Seals are damaged					x	x	x		x	13
Loose couplings					x	x	x			14



### 3.5.2 Solutions

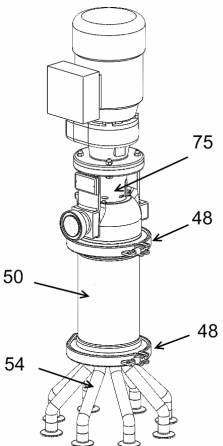
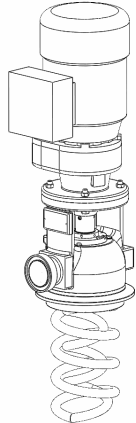
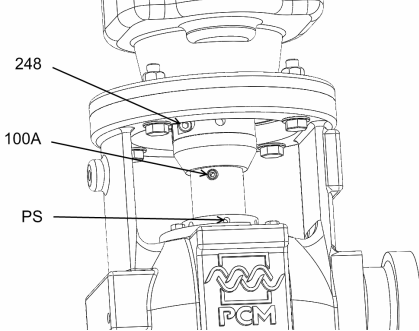
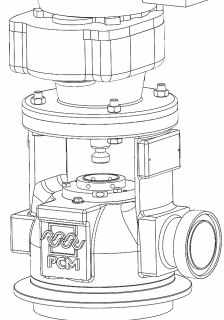
- 1) Modify product temperature to ensure that is within the acceptable limits (see section 'Operating Specifications')
- 2) Clean the mixer.
- 3) Remove these bodies and take necessary measures (strainers) to stop them.
- 4) Check the network voltage, motor connections, circuit breaker calibration, and number of phases.
- 5) Replace defective parts and check the load on the drive.
- 6) Disassemble the mixer, clean it, and replace any defective components.
- 7) Remove the mechanical seal and replace it with a new one.
- 8) Adjust inlet flowrate and/or rotor speed (if variable speed drive installed)
- 9) Check all pipes for obstruction by a foreign body, for a defective or improperly sealed valve, etc...
- 10) Re-arrange the overall layout of the installation, or provide a dry running protection system.
- 11) For any viscosity change, consult **PCM Services** for advice.
- 12) Measure the pressure using a pressure gauge, and compare it to the pressure stated in the 'Operating Specifications' section.
- 13) Replace seals
- 14) Check the couplings (collars, bolts) and tighten up if necessary

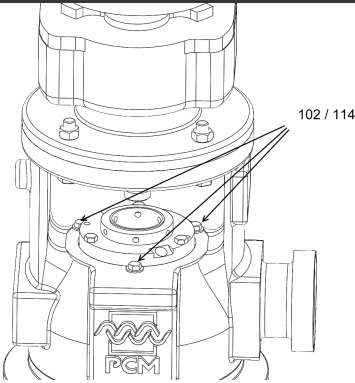
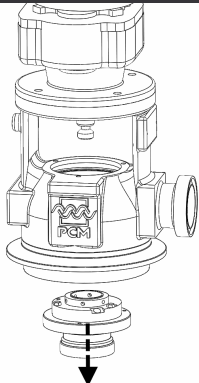
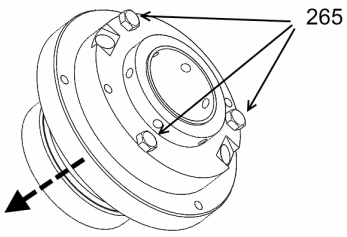
### 3.5.3 Equipment disassembly

#### 3.5.3.1 On-site disassembly

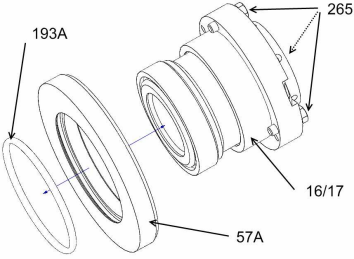
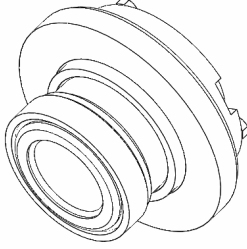
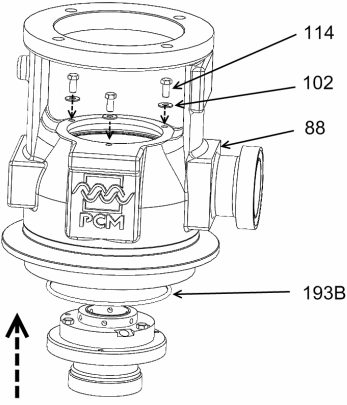
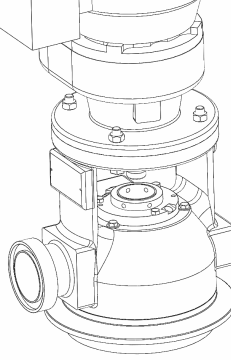
- Isolate the mixer from the electrical circuit and secure it.
- Close suction and discharge valves (if applicable)
- Obtain information concerning the fluid so as to implement any precautions required for personnel safety.
- Empty the mixer.
- Remove the connecting pipework to the mechanical seal (if applicable)
- Remove the connecting pipework from and to the mixer and mark electrical connections (for rotation direction when re-installing).
- The wear parts of the Dosymix™ can be replaced without removing the bell (88) and the drive.

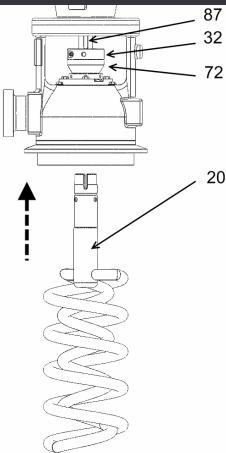
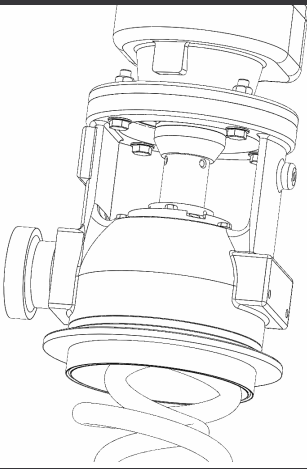
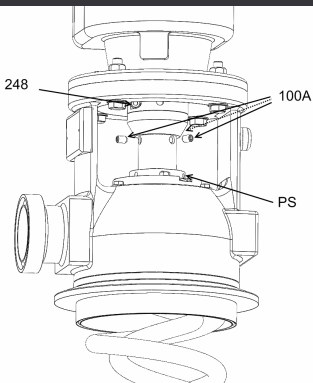
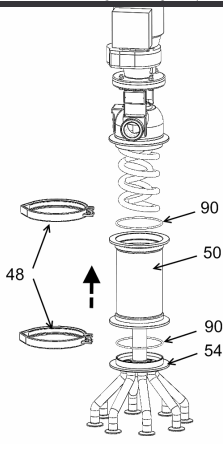
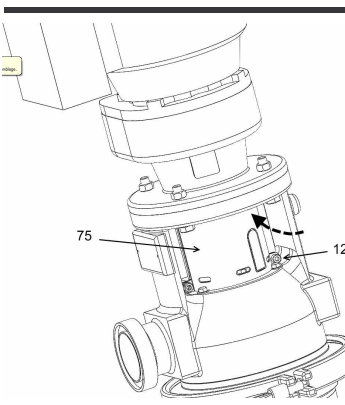
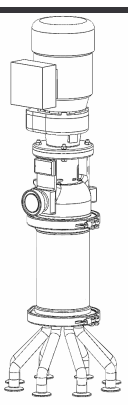
#### 3.5.3.2 Removal of mechanical seal

	<ul style="list-style-type: none"> <li>• Remove the clamp collars (48) and the protective guards (75).</li> <li>• Remove carefully the outlet plate (54) and the casing (50) c/w O'rings (2 off).</li> </ul>	
	<ul style="list-style-type: none"> <li>• Remove the clamp ring screw (248).</li> <li>• Remove the mechanical seals pressure screws (PS).</li> <li>• Holds the shaft before removing the 3 screws (7) which will set it loose.</li> <li>• Slide the shaft down and put it away carefully.</li> <li>•</li> </ul>	

	<ul style="list-style-type: none"> <li>Remove the screws item 114 (3 off) c/w washers (102) and force the mechanical seal down whilst holding it (if necessary, use a soft mallet)</li> </ul>	
	<ul style="list-style-type: none"> <li>Remove the screws item 265 (3 off) and push the support ring along the mechanical seal to free it.</li> </ul>	

### 3.5.3.3 Reassembly of mechanical seal

	<ul style="list-style-type: none"> <li>Fix the mechanical seal (16/17) onto its support (57A). Use food compatible grease.</li> <li>Replace O'ring item 193A if necessary.</li> </ul>	
	<ul style="list-style-type: none"> <li>Slide the mechanical seal assembly inside the bell (88). Use food compatible grease.</li> <li>Replace the O'ring item 193B if necessary.</li> <li><b>IMPORTANT:</b> make sure the holes in the support (57A) are inline with the holes of the bell and in case of a seal c/w quench, check the position of the quench inlets for clearance.</li> <li>Fix the support using the screws and washers (items 114 and 102)</li> </ul>	

	<ul style="list-style-type: none"> <li>Place the deflector (72) and the clamp ring (32) (with screw item 248 in place) on top of the mechanical seal</li> <li>Slide carefully the shaft (20) up through the mechanical seal.</li> <li>The deflector and the clamp ring will position themselves on the shaft. Check correct assembly manually.</li> <li><b>IMPORTANT:</b> make sure the key hole on the shaft is in line with the key on the drive shaft</li> </ul>	
	<ul style="list-style-type: none"> <li>Apply LOCTITE® 243 blue thread locker to new screws (100A). Whilst holding the shaft (20), screw these into the drive shaft</li> <li>Until the assembly is secured in position on the motor shaft.</li> <li>Remove the pressure screws (PS) from the mechanical seal ring (16/17), coat them with LOCTITE® 222 thread locker and re-insert them and tighten on the drive shaft (36).</li> <li>Position the clamping ring (32) and its screw (248) so that the hole for the pressure screw is opposite and centered on the shaft key. Coat the pressure screw (248) and tighten it.</li> </ul>	
	<ul style="list-style-type: none"> <li>Check the shaft assembly by rotating slowly the helix.</li> <li>Replace the casing (50) using new O-rings (90) if necessary. Use food compatible grease.</li> <li>Hold the casing in place with one of the clamp collar (48)</li> <li>Insert the outlet manifold (54) upward and secure it with the second collar.</li> </ul>	
	<ul style="list-style-type: none"> <li>Complete the re assembly by adding the two guards (75) held together with 2 screws (122)</li> </ul>	

**Note: Never remove a mechanical seal that is not leaking.**





#### **3.5.3.4 Removal of protection casing (if applicable)**

- Unscrew the anchor screws from the protection casing
- Remove the protective casing from above (using the lifting eye where provided).

### **3.6 Conservation of equipment when stopped**

- Release internal pressure.
- Clean piping and mixer using a reagent that is compatible with the pumped liquid and the materials from which the mixer is made.
- Empty and dry the equipment.
- Block inlet and outlet with end caps.

#### **3.6.1 Conservation of rubber components**

- For the storage of rubber components like seals (Items – 90 – 193A – 193B), we recommend storage in a cool room away from direct sunlight to protect from UV radiation.

### **3.7 Accessories**

See specific instructions in Section 4 – Appendices.



## 4. APPENDICES

Risk prevention.  
Sectional drawing  
Technical description  
Accessories (optional)  
Automatic control (optional)



# RISK PREVENTION

## PCM EQUIPMENT RETURN

COMPANY USING THE EQUIPMENT

.....  
.....  
.....

ACTIVITY .....

Equipment Part No. ....

Is the equipment liable to present any particular risks  
by being used?

yes ☐

no ☐

CHEMICAL RISKS

yes ☐

no ☐

Product or Substance	Mode of Contamination	Prevention

BIOLOGICAL RISKS

yes ☐

no ☐

Biological Agents	Mode of Contamination	Prevention