

## LT

### Electro pumps

#### Installation and maintenance

# LT

## Electro pumps

### GENERAL

## 1 - GENERAL

The LT range of monobloc electro pump units should be installed in accordance with the instructions in this manual. They must not be used in duty conditions other than those indicated in this document.

Should these instructions not be adhered to, or the equipment be modified in any way without LEROY-SOMER's approval, the guarantee is immediately rendered null and void.

LEROY-SOMER cannot be held responsible if the instructions contained in this document have not been followed.

This manual does not take account of existing safety recommendations and regulations which may be in force where the equipment is installed. It is the responsibility of the user to ensure that these are applied and adhered to.

## 2 - USE

The LT range of centrifugal, mono-cellular, monobloc electro pump units are designed to carry water, and any other clear liquid which is non-contaminated, non-abrasive, non-corrosive, non-explosive and compatible with the material of which the pump is made.

For any other pumped liquid : please consult LEROY-SOMER.

- maximum content of solid particles in suspension: 50 g/m<sup>3</sup>
- maximum temperature of pumped liquid: 60 °C
- minimum temperature of pumped liquid: - 10 °C
- maximum ambient temperature: 40 °C
- maximum duty pressure of the pump (on lift): 6 bar
- density of pumped liquid: 1
- viscosity of pumped liquid: 1 mm<sup>2</sup>/s

## 3 - CHARACTERISTICS

Each electro pump unit has two identification plates, one which defines the hydraulics, and the other the motor.

### 3.1 - Hydraulic characteristics

The hydraulic characteristics are guaranteed to conform to international standard 9906 level 2 for mass-produced pumps.

	TYP	LT 33	Electro pump type
	N°	L 070225	Electro pump serial n°
	H max	32 m.	Total maximum manometer lift in meters

MOTEURS LEROY-SOMER

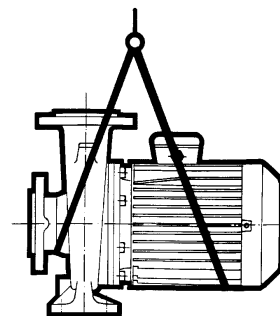
### 3.2 - Electrical characteristics

							Type of motor
Mot 3 ~ LS 80							
N 343566DG001 kg							
IP 55 cl F °C 40 S S 1							
V	Hz	min <sup>-1</sup>	kW	cos φ	A		
Δ 220	50	2810	1.1	0.86	4.50		
Y 380		2810	1.1	0.86	2.60		
Δ 230	50	2825	1.1	0.82	4.50		
Y 400		2825	1.1	0.82	2.60		
Δ 240	50	2845	1.1	0.78	4.60		
Y 415		2845	1.1	0.78	2.70		

## 4 - HANDLING

Electro pump units should be handled and unpacked with care.

For sling hoisting operations, we recommend the unit is handled as shown in the sketch below.



## 5 - STORAGE

In good storage conditions, our electro pump units are not at risk of deterioration.

They should be stored in dry, enclosed areas, away from inclement weather conditions, dust, vibration, and shocks.

If there is a risk of freezing temperatures in the storage area, ensure that the pump has been drained.

Do not place units leaning against the motor fan cover.

Before commissioning or re-commissioning an electro pump unit, always read the instructions contained in this manual, and follow them carefully.

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## Electro pumps

### INSTALLATION

## 6 - INSTALLATION

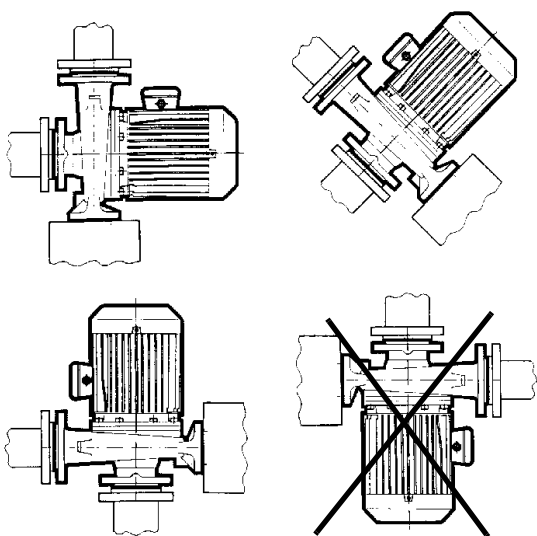
**Electro pump units must be installed by personnel suitably qualified to undertake this type of work.**

Install the unit as close as possible to the water supply in an easily accessible location.

The suction and delivery pipes must be fitted in such a way that they do not create any mechanical force on the casing of the pump.

We recommend fixing the unit on a concrete pillar. If necessary, wedge it in position.

The unit can be installed in a number of positions, but not with the motor under the pump (see sketch below).



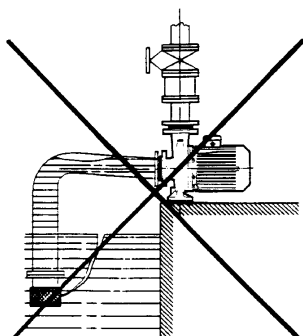
### 6.1 - Suction pipe

This pipe must be large enough in diameter to avoid significant loss of pressure. It must be absolutely watertight, capable of resisting depressurization and should not have any high points.

A watertight inlet filter valve must be fitted at the bottom end.

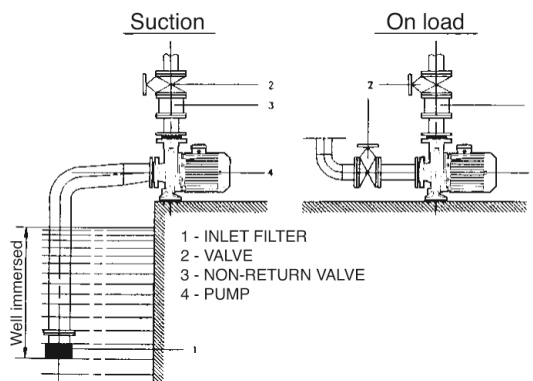
An incline of 2 % rising towards the pump is advisable to ensure that no liquid remains in the pipe.

The inlet filter should not allow the passage of particles larger than 2 mm. It should be placed at a depth below the lowest water level so that outside air cannot be siphoned in, and kept away from the walls and the bottom of the well.



If the pump is working on load, the bottom valve is replaced by an isolation valve on the pump.

If the diameter of the suction pipe is greater than the nominal diameter of the pump intake, use a reducer to connect them.



### 6.2 - Discharge pipe

The diameter of this pipe should be chosen after first carefully calculating the installation pressure losses.

Place a flow-control valve on the pipe and a non-return valve upstream of this valve.

### 6.3 - Before commissioning

- Make sure that the electro pump rotates freely without sticking.
- Fill the suction pipe and the pump, taking care not to let any air get in, by unscrewing the filler cap: rep.90.
- Check that the bottom inlet filter valve is watertight and the water level has not dropped near to the opening: rep.90.
- Screw the filler cap back on : rep.90.

### 6.4 - Sticking check after breakdown

After breakdown time, turn pump shaft in order to avoid sticking of the electro pump.

In this way, as the pump is stopped, put the screwdriver in the end of shaft (ventilator face) in the slot and turn shaft several times.

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## Electro pumps

### ELECTRICAL CONNECTION

## 7 - ELECTRICAL CONNECTION

**Electrical connection must be performed by a qualified electrician taking any existing regulations into account.**

If the electro pump unit has been stored in damp conditions, check the motor insulation resistance before commencing any electrical connection. This should be a minimum of 10 megohms in cold state under 500 volts for a period of 60 seconds.

### 7.1 - Power supply

Make sure that the supply voltage indicated on the motor identification plate corresponds to the actual electricity supply.

Check that the diameter of the meter incoming and outgoing conductors is adequate to supply the unit with the correct power.

### 7.2 - Connections

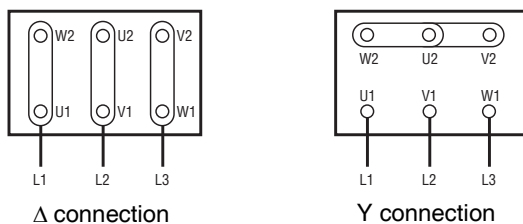
The motors are delivered with the following connections:

#### 3-phase

$\Delta$  230 / Y 400 V at 50 Hz

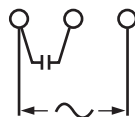
Make absolutely sure that the type of connection corresponds to the mains supply voltage.

It must be connected as show in the diagram below, which appears on the terminal box lid.



#### Single phase

230 V single phase at 50 Hz



### 7.3 - Protection

Connect to earth as required by current regulations.

In order to benefit from the guarantee, it is essential to protect the motor electrically by placing a thermal magnetic circuit-breaker between the isolator and the motor. This circuit-breaker may also be fused.

Before starting up the unit, the circuit-breaker should be set provisionally to the correct current (shown on the identification plate) for the corresponding mains supply voltage.

Definitive setting should be performed as instructed in paragraph 8.

So as not to subject the unit to excessive temperature rises, a maximum number of 20 starts per hour should not be exceeded.

This number of starts should be spread over the hour.

## 8 - STARTING THE PUMP UNIT

An electro pump unit must never be run on empty. This is very important to ensure the mechanical seal remains watertight.

- Open the intake valve (for an on load pump).
- Fill the pump and suction pipe with the liquid to be pumped.
- Close the outlet flow-control valve.
- Make sure that the direction of rotation is that indicated by the arrow on the fan cover, by running the motor for a couple of turns.
- If the direction of rotation is reversed, modify the connection to the motor terminal block by reversing 2 power supply wires.
- After starting, once the motor has reached its operating speed, make sure that the back pressure is normal, and not subject to significant fluctuations.

If this is not the case, stop the pump and re-fill it. If the problem persists, look for air getting into the suction pipe.

- If the motor is not running fast enough, check the connection.
- Gradually open the pressure valve until the desired flow or pressure is achieved.
- Take care not to leave the pressure valve closed for more than 5 minutes.
- With the unit operating normally, measure the maximum current drawn on each phase. Set the circuit breaker definitively, for a slightly higher current than the maximum measured. The latter must never exceed the current indicated on the motor identification plate.
- Check that the voltage between phases at the motor terminals is correct.
- Any disruption to operation indicates abnormal pump unit operating conditions (voltage drop, broken phase, incorrect setting, foreign particles in the pump, sludge, etc.).
- The unit should turn smoothly without vibrating.
- Never run the unit with a closed valve (whether the intake or the pressure valve).

**Running the pump unit on empty is absolutely prohibited.**

## 9 - STOPPING THE PUMP UNIT

- If the unit is not fitted with a non-return valve, close the pressure control valve to avoid water hammer.
  - Switch off the electrical supply to the motor.
  - In the event of prolonged stoppage and/or risk of freezing, drain the suction and delivery pipes as well as the pump itself, or take precautions against freezing by appropriate methods.
- To drain the pump, unscrew the special cap, rep.89.

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## Electro pumps

### SERVICING

## 10 - SERVICING

Practically no servicing is required.

The bearings are permanently greased, and do not therefore require any attention.

The mechanical seal will have been adjusted during assembly of the pump. It will remain watertight until noticeably worn and should then be changed.

Pump units installed as backup equipment should be run for a short time once a week, to ensure that they are working properly.

## 11 - DISMANTLING - REASSEMBLY

**Dismantling and reassembly of an electro pump unit must be performed by personnel qualified to carry out this type of work.**

Where one or more components of an electro pump are being replaced (spare parts), it is essential that only parts supplied by LEROY-SOMER are used. Failure to comply with this instruction invalidates the guarantee, and relieves the manufacturer of responsibility for any malfunction.

Any person who tampers with an electro pump unit is responsible for the consequences.

### 11.1 - Dismantling

Before commencing work on the unit:

- Disconnect the motor from the electrical supply.
- Close the intake and outlet valves.
- Check that the pump casing is not under pressure.
- Drain the pump.

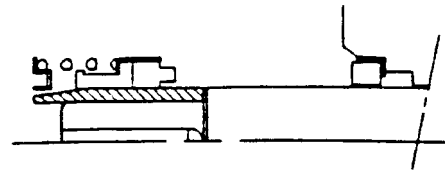
The unit should be dismantled as follows:

- Lift off the pump casing, rep.01 after unscrewing the machine bolts, rep.86.
- Remove the locking screw, rep.84 and the turbine washer. This screw will have been tightened in the opposite direction to motor rotation (see arrow on the motor fan cover or on the pump casing).
- Take out the impeller, rep.26
- Remove the key, rep.54
- Take off the revolving joint, rep.71
- Remove the base, rep.11

### 11.2 - Dismantling and reassembling the mechanical seals

- Take out the spacer ring, rep.72 from the base, rep.11 using a mandrel. The housing for the spacer ring must be clean. Clean it and put in a new spacer ring, lubricating both the rubber ring and its housing with a solution of 10 % Teepol in clean water.
- Slip the spacer ring into its housing by exerting pressure with a plastic tubular mandrel.
- Make sure that the friction surface is dry and clean, and also that the part of the shaft against which the revolving joint, rep.71 will slide.
- After refitting the base, rep.11, fit a revolving joint, rep.71, using a clean removable taper shaft lubricated with the same solution, and a propulsion tube to position it.

### Taper shaft



- When performing these various operations, take care not to damage the friction surfaces of the mechanical seal.

#### Note :

- Never use oil or grease when assembling the unit.
- Never oil or grease friction surfaces.
- Before locking the turbine onto the shaft, make sure that the mechanical seal is perfectly positioned.

### 11.3 - Reassembling

- To reassemble, carry out the dismantling procedure in reverse.
- Clean all parts carefully, and if necessary change the seal, rep.81, which may have deteriorated.

## 12 - SPARE PARTS

To order spare parts, please specify:

- type of electro pump,
- electro pump serial number,
- description of the part with its part number, as shown on the diagram and on the parts list in this document.

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## Electro pumps

### SPARE PARTS



#### DECLARATION OF CONFORMITY

**THE MANUFACTURER :** MOTEURS LEROY-SOMER  
16015 ANGOULEME CEDEX  
FRANCE

**DECLARES THAT ELECTROPUMPS IN THE SERIES:**

- CALYPSO - CENTAURE - RESIST - EVAC - DRAIN - SUBAX - BIOSANIT - SANISTAT - PJ - LSPRO - PUIZA - AMINOX - BALLAST - BALLAST B - BALLAST P - BALLAST S
- PA - RA - TA - ISA - X6 - X8 - X10 - X12
- SP - LT - LSIO - LS - CA - IN - INCA - LSMH - MIH INDUS - MIV - FU

**COMPLY WITH THE PROVISIONS OF THE "MACHINERY" DIRECTIVE AND NATIONAL LEGISLATION TRANSPOSING IT INTO LAW**

- "Machinery" Directive 98-37 EC dated 22/06/98

**HAVE BEEN DESIGNED TO COMPLY WITH THE ESSENTIAL REQUIREMENTS OF THE FOLLOWING EUROPEAN DIRECTIVES:**

- "Electromagnetic Compatibility" Directive 89-336 EEC dated 03/05/89 modified by Directive 92-31 EEC dated 28/04/92 and by Directive 93-68 EEC dated 22/07/93
- "Low Voltage" Directive 73-23 EEC dated 19/02/73 modified by Directive 93/68 EEC dated 22/07/93

**NB:** When the electropumps defined above are powered by customized electronic inverters and/or controlled by electronic control and monitoring devices, they must be installed by a professional who will be responsible for ensuring that the electromagnetic compatibility regulations of the country in which the product is used are observed.

Signed at Angoulême, on 30 April 2008

L. CELERIER  
Quality Director MOTEURS LEROY-SOMER  
Champniers department

Q80T046 Rev.A - 07/01/08

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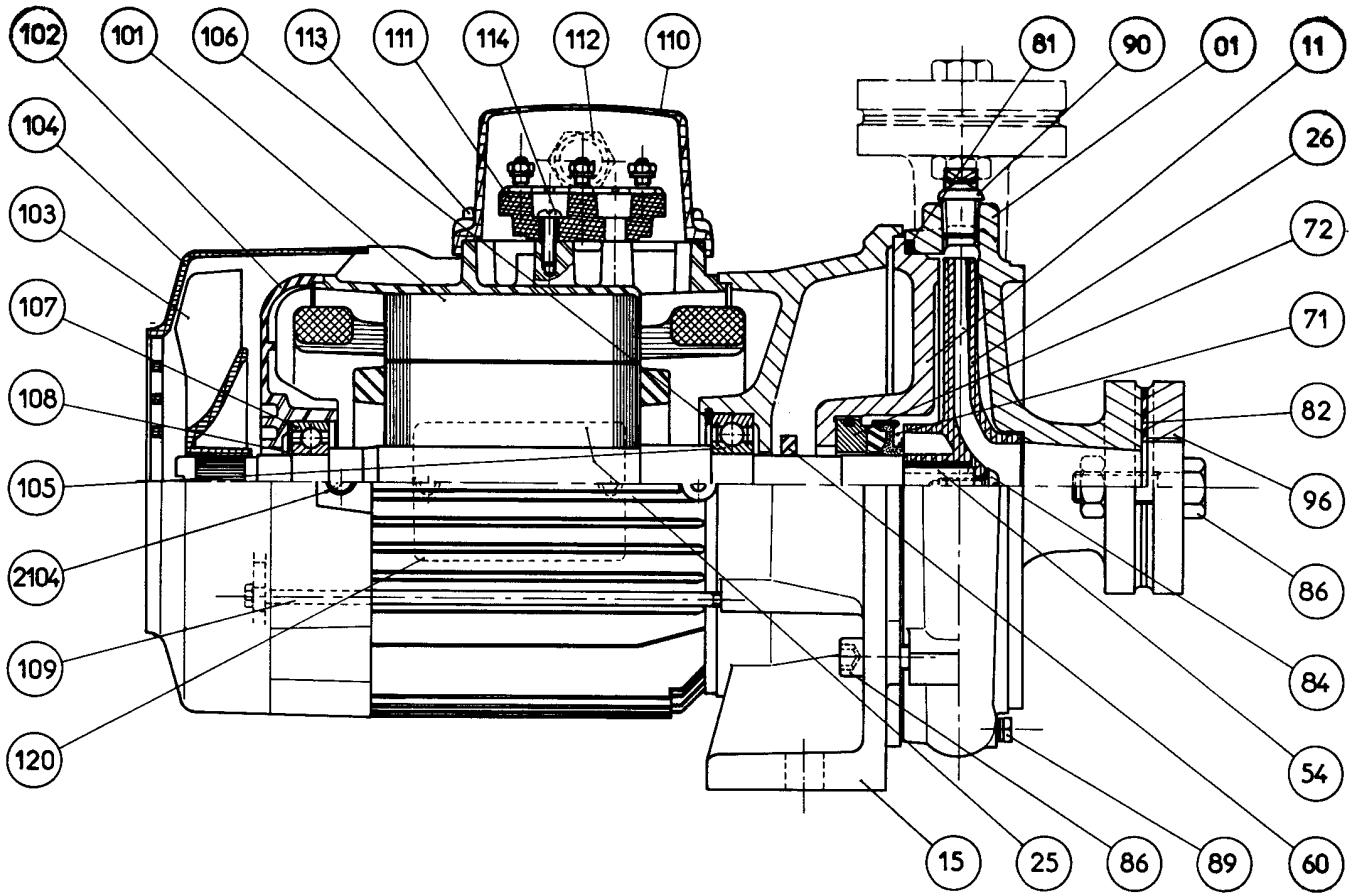
### SPARE PARTS

Fault	Cause	Remedy
The motor will not start.	<ul style="list-style-type: none"> <li>- Circuit-breaker faulty or incorrectly set.</li> <li>- The supply voltage is correct but the voltage at the motor terminals is too low.</li> <li>- The motor is not properly connected.</li> </ul>	<ul style="list-style-type: none"> <li>- Check the circuit-breaker.</li> <li>- Redo the unit power supply line, increasing the diameter of the wires.</li> <li>- Comply with the wiring diagram (connection to the motor).</li> </ul>
The pump will not start.	<ul style="list-style-type: none"> <li>- Pump casing not filled sufficiently.</li> <li>- The inlet filter valve is not sufficiently immersed.</li> <li>- Direction of rotation reversed (3-phase motor).</li> <li>- Intake manometric lift too great.</li> <li>- The suction pipe is not watertight or has a counter-slope where an air pocket forms.</li> <li>- The valve is stuck.</li> </ul>	<ul style="list-style-type: none"> <li>- Fill up the pump.</li> <li>- Check the depth of immersion.</li> <li>- Reverse 2 cables on the motor terminal block.</li> <li>- Reduce the lift (minimize pressure losses).</li> <li>- Check the suction pipe.</li> <li>- Check the valve.</li> </ul>
Inadequate performance.	<ul style="list-style-type: none"> <li>- Direction of rotation reversed (3-phase motor).</li> <li>- Total manometric lift is greater than expected.</li> <li>- Intake manometric lift too high.</li> <li>- The pump, intake valve or inlet filter valve are partially obstructed.</li> <li>- Counter-slope on intake where an air pocket forms.</li> <li>- Air entering on intake.</li> </ul>	<ul style="list-style-type: none"> <li>- Reverse 2 cables on the motor terminal block.</li> <li>- Use a more sophisticated pump or minimize the pressure losses.</li> <li>- Reduce the geometric intake lift.</li> <li>- Minimize the pressure losses on the suction pipe.</li> <li>- Clean them and remedy the problem.</li> <li>- Make sure the suction pipe has a minimum upward slope of 2 cm per metre.</li> <li>- Check that the suction pipe is airtight.</li> <li>- Check the depth of immersion of the inlet filter valve.</li> </ul>
The circuit-breaker trips.	<ul style="list-style-type: none"> <li>- Permanent overload due to inadequate HMV, resulting in too high a flow.</li> <li>- Permanent overload due to excessive viscosity or density of the liquid being pumped.</li> <li>- Excessive voltage drop.</li> <li>- Operation with 2 phases (3-phase motor).</li> </ul>	<ul style="list-style-type: none"> <li>- Fit a control valve on the pump delivery pipe to slow down the flow.</li> <li>- Please consult LEROY-SOMER.</li> <li>- Increase the voltage or the cable diameter.</li> <li>- Inspect the supply cables and connection terminals.</li> </ul>
Leaking mechanical seal.	<ul style="list-style-type: none"> <li>- Faulty mechanical seal.</li> </ul>	<ul style="list-style-type: none"> <li>- Check and replace all the components of the mechanical seal (never run on empty).</li> </ul>
Unit vibration.	<ul style="list-style-type: none"> <li>- Conformity of the various points indicated above.</li> <li>- Abnormal restriction on the flanges.</li> <li>- Faulty motor bearings.</li> </ul>	<ul style="list-style-type: none"> <li>- Check these points.</li> <li>- Check the connection of the pipes to the pump flanges and remove any restrictions (reposition pipes or fit flexible collars).</li> <li>- Check and change the bearings (with same size and type).</li> </ul>

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## Electro pumps

### SPARE PARTS



Rep.	Nb	Description	Material	Rep.	Nb	Description	Material
01	1	Volute casing	Cast iron	101	1	Housing and wound stator	Alpax
11	1	Spacer ring support plate	Cast iron	102	1	Shield on fan end	Cast iron
15	1	Motor front flange	Cast iron	103	1	Fan	PA 6/6
25	1	Rotor	Z30 C13	104	1	Cover	P.p.
26	1	Impeller	Plastic	105	1	Bearing on pump end	Steel
54	1	Parallel key 4 x 4 x 22	Steel	106	1	Circlips	
60	1	Deflector 16 x 30 x 5	Rubber	107	1	Bearing on fan end	Steel
71	1	"CYCLAM" seal 20 x 42 x 12		108	1	Flexible washer	Steel
72	1	Spacer ring 20 x 45 x 10		109	4	Tie rod	Steel
81	1	Sealing ring 152 x 3.5		110	1	Terminal box	A.B.S.
82	2	Companion flange seal 69x34x4		111	1	Terminal block	P.21
84	1	Impeller locking screw - M6	Stainless steel	112	1	Cable gland	Nylon
86	4+4	Machine bolts M8 and M10	Steel	113	4	Terminal box screw	Steel
89	1	Drain plug M6 x 10		114	1	Terminal block screw	Steel
90	1	Filler cap 1/4"		120	1	Identification plate	Aluminium
96	2	Oval flange	Cast iron	2104	1	Cover fixing screw	Steel



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**MOTEURS LEROY-SOMER 16015 ANGOULÊME CEDEX - FRANCE**

RCS ANGOULÊME N° B 671 820 223

S.A. au capital de 62 779 000 €

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