

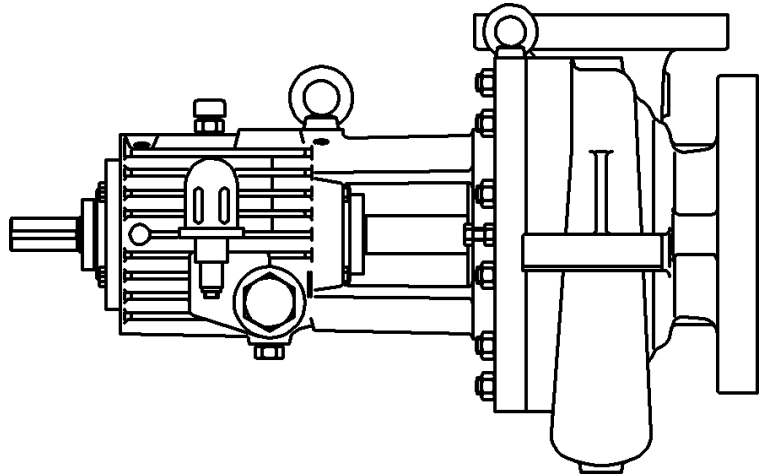
Gruppo Aturia



SMKM

CENTRIFUGAL PROCESS PUMPS (API 610)

INSTRUCTION MANUAL



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FOREWORD, WARRANTIES AND LIMITATIONS

The purpose of this instruction manual is to ease as much as possible the installation, operation and servicing of **SMKM** process centrifugal pumps.

We strongly recommend to read it attentively and to consult it whenever work is done on the pump, to guarantee the correct operation of the pump and the maximum safety for the personnel in charge of pump installation, starting and maintenance.

We remember that the SMKM pumps are potentially dangerous to the person and to the things due to the presence of:



Hight speed rotating parts
-Hight pressure and temperature



-Dangerous fluids
-Electrical connections.

ATTENTION !

UNOBSERVANCE OF THE INSTRUCTIONS HERE REPORTED OR IMPROPER USE OF THE PUMP BY UNSKILLED PERSONNEL MAY RESULT IN HEAVY DAMAGE TO THINGS AND/OR INJURIES TO THE PERSON .

ATURIA TECHNICAL ASSISTANCE IS READILY AVAILABLE FOR ANY DOUBT OR POSSIBLE PROBLEM, PLEASE CONTACT US ALSO BY PHONE.

Documents check

Check the equipment at delivery against the accompanying documents, paying particular attention to its completeness and to possible damages occurred during transportation. The same should be done for any ancillary equipment.

Warranty and limitations

The warranty does not include possible damages or failure caused by mishandling, wrong electrical connections and uncorrect assembling; the warranty also excludes in all cases the emission of pass certificates and reimbursements for the equipment or for consequential damage.

Aturia declines any responsibility for damages to persons and things due to improper use of the machinery here described.

Consumable components are not subject to warranty.

CHAPTER 1

1 - GENERAL DESCRIPTION

1.1 Construction features

SMKM pumps are centerline, centrifugal process pumps designed according to API 610 Standards, 8th edition .They are used for **heavy duty** services .

The performances of this pump meet a large use in refinery and industry for chemical products, petroleum and liquefied gases.

The standardization of the support and the stuffing box permit interchangeability of a lot of components and a minimum maintenance spare parts with a low cost of storage.

The design of these pumps is the result of a long experience acquired during the last thirty years by the installation of a lot of them in important plants in Italy and all over the World..

Pump casing

The pump casing is steel cast volute type, vertical split, back open, centerline feet mounting.

Stuffing box

The stuffing box close back the pump casing.

The seal chamber is designed according to API 610 with large size.

It allows to mount the packing seal or the mechanical seal (single, balanced, double , API 682, according to pumped liquid or as per plant requirements).

The stuffing box has a chamber for cooling or heating , if required, according to the pump service or the type of pumped liquid.

Impeller

Impeller is designed with optimum inlet area for low NPSH, it is hydraulically balanced so that the bearings are working with low axial thrust and are dynamically balanced for running with low vibration.

Support

The support is back pull out type, it is fixed on the stuffing box by a set of screws and it is possible to disassemble the rotor without removing the pump casing and the motor.

The standard construction is fitted with balls bearing (pump side) double thrust balls bearing (driver side) suitable to support a high axial thrust.

The bearings are oil lubricated by a constant level oiler.

Shaft

The shaft sealing area of the pump is protected by shaft sleeve.

The shaft seal is packing or mechanical type according to pumped medium and sales contract

1.2 Fields of application

SMKM pumps working range:

_Capacity up to 1500 cm/h _ Pressure up to 50 Bar _Temperatures between –100 up to +450 °C

(the performances and the duty are pointed out in the pump technical data sheet of the order)

SMKM pumps are mainly employed in the following applications:

- _Petrochemical plant
- _Refineries, industries and all **heavy duty** services
- _Transfer of petroleum product , high temperature liquids, or liquefied gases

1.3 Noise levels

The following table reports the noise level produced by **SMKM** electro-pumps running within their operating limits and installed according to the instructions given in this manual.

Average values measured in free field at 1 meter from the pump and elaborated according to ISO curve A - standard R1680.

The values are referred to pump/motor groups with Aturia standard electric motors; For others motors the table values may be compared to the actual used motors.

MOTOR SIZE	NOISE LEVEL	
	dB (A)	
	2POLI	4 POLI
63	65	61
71	67	62
80	71	64
90	73	66
100	77	68
112	79	69
132	80	69
160	81	69
180M	81	69
180L	83	71
200	83	71
225	88	74
250	88	74
280	89	83
315S	89	83
315M	90	84
355	91	87
400	93	89

CHAPTER 2

2 - TRANSPORT AND STORAGE

2.1 Transport

Before transportation, please check :



- weight of pump/motor group
- overall dimensions of pump/motor group
- suitability of lifting points.

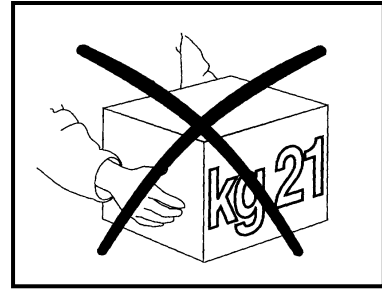
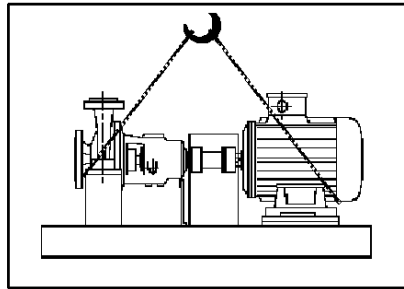
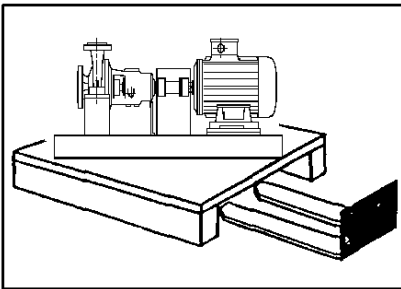
The pump can be despatched in the following ways:

- a) single pallet
- b) wooden box
- c) according to sales contract

ATTENTION !

The pump should be transported by equipment suited to its weight and to the shape of package.

Lifting by hand is allowed only for weights lower than 20 kilograms.



2.2 Site installation



During the site installation and maintenance a safety transport of all the components is to be done;

The specialized personnel must use the proper slings in order to avoid any damage to the pump and to the people .

The lifting eyebolts of pumping set components must be used for lifting only each related component; please refer to the above pictures in order to move the whole skid .

2.3 Storage

Generally, the pump delivered is suitable for immediate installation.

The method of delivery will be in accordance with the conditions specified in the sales contract.

Storage for a period of less than 3 months

- The pump flanges need to be closed, so that no foreign objects can enter the pump
- Store the pump in a dry, dust-free area
- Check that ambient temperature never falls lower than 5°C
- It is recommended that the pump shaft is rotated one quarter turn each month, this prevents damage to the bearings and seizure of the rotating parts.

Storage for a period exceeding 3 months

- Rise the pump by means of wooden supports.
- Open the package, if any remove protection from pump nozzles and clean by compressed air, then carefully dry inside the pump, if necessary.
- The inside of the pump must be protected with conservation oil and the flanges need to be closed, so that no foreign objects can enter the pump.
- Cover the pump with plastic film and put inside some products that prevent water condensation.
- Check protections periodically
- Fill bearing support with oil (see par.6.1)
- It is recommended that the pump shaft is rotated one quarter turn each month, this prevents damage to the bearings and seizure of the rotating parts.

Storage (after operation)

- In case of long idle periods after operation , drain the pipings and the pump through the drain hole in the lower part of casing and pipes.
- Follow above instructions according to circumstances..

CHAPTER 3

3 - GENERAL SAFETY INSTRUCTIONS

3.1 General instructions

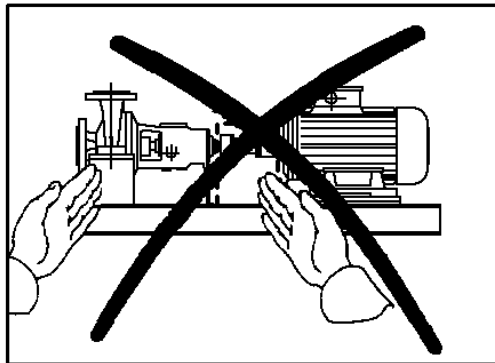


The pump(s) should be used only for the applications specified in the data sheet. Recommended working limits must be strictly observed. In case of applications not specified on this manual, please contact Aturia to check pump suitability, installation safety and pump life.

3.2 Precautions during operation



- The coupling guard must be absolutely fitted on baseplate
- If warm media was pumped, protect the pump to prevent the contact with the warm surfaces of the pump.
- Never put your hands or any kind of object into pump openings where the shaft rotates (see picture).



ATTENTION !



- Protect motor and electric parts in general according to current regulations.

WE RECOMMEND BESIDES TO INSTALL THE PUMP IN A SAFE PLACE

3.3 Residual risks

Unobservance of the safety instructions here reported or improper use of the pump may result in heavy damage to things and/or injuries to the person.

Take care not to:



- kick the pump.
- damage the pump by wrong handling.
- pressurize the pump beyond recommended limits.
- cold fluids uneven contact with the warm surfaces of the pump.
- use the pump improperly with dangerous fluids or different from what specified in the data sheets.

3.4 In case of emergency

- switch off line voltage
- warn service personnel responsible of plant.

CHAPTER 4

4 - INSTALLATION

4.1 Installation

For what concerns pump handling at the installation site, please refer to section 2.1- 2.2

A number of provisions should be considered when designing the premises in which the pumpset is to be installed, these are:

The installation is carried out in a dry dusty free area, ambient temperature between 5 and 40 °C.

(other ambient conditions must be specified in the sales contract)

The unit is accessible from all sides, for inspection, maintenance and possible repairs.

Sufficient hoisting facilities are available, with sufficient lifting power.

Leave enough space for motor ventilation.

The pump unit should be installed on a sturdy foundation such as :

A concrete foundation slab

A metal frame assembly

A concrete foundation slab is most suitable, as distortion of such a slab is very unlikely, this method is the most frequently used.

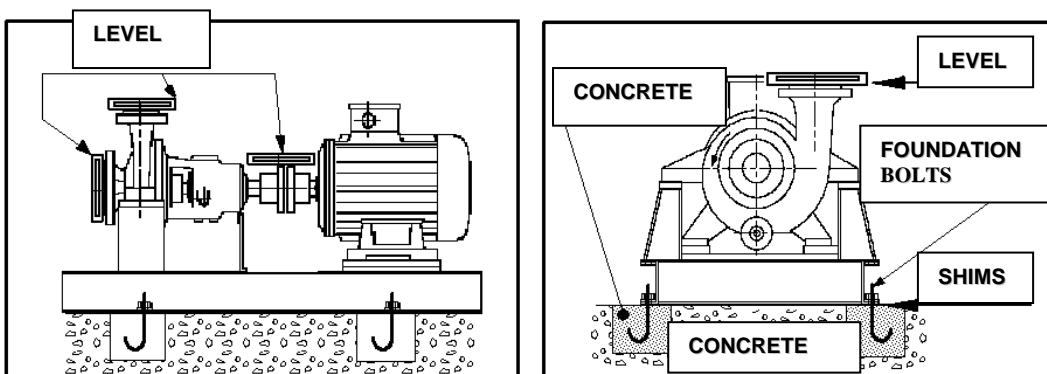
The foundation should be sufficiently designed and dimensioned to carry the weight of the pump unit and, also, to fully absorb the vibrations that occur when the pump is in full operation.

The group should be installed on a horizontal leveled plane. To this purpose, check leveling when anchoring the group baseplate to the concrete slab by placing a level (bubble tube) on the pump delivery flange (see below pictures).

The foundation bolts can be tightened only after complete hardening of the concrete

ATTENTION !

THE GROUP MUST BE INSTALLED ON A HORIZONTAL LEVELED PLAN



4.2 Pippings

The pipes can be connected when the concrete foundation has hardened sufficiently and the anchor bolts have been well tightened.

The following points should be observed during the fitting of the pipes:

The pipes should be adequately supported so that the weight is not placed on the pump nozzles.

The pump and piping flanges should be placed exactly parallel and in correct alignment.

When connecting the flanges, no tension or pressure should be applied to the pump flanges.

The possible residual forces on pump flanges must never exceed the limits specified in the pump technical data sheet, on the other side it is recommended that compensation connections are included in the pipes to compensate any deviations that may occur.

Pipe dimensions should not be determined according to the pump nozzle diameters, but only according to the friction losses, avoid narrow bends and elbows, and conical joints wrongly placed.

The suction pipe should be absolutely airtight, without counterslopes where harmful air bubbles can collect.

We recommend the use of gate valves upstream and downstream the pump.

ATTENTION !

**THE RESIDUAL FORCES ON PUMP FLANGES MUST NEVER EXCEED THE LIMITS SPECIFIED IN THE
PUMP TECHNICAL DATA SHEET**

4.3 Alignment

After positioning the pump unit on the foundation and connecting the pipes, before starting, it is necessary to align it with due precision.

When pump is supplied together with a driver on a common base plate the unit is already aligned, although the alignment can be disturbed during transport and/or the fitting of the pipings and/or the positioning on the foundation. (see pos. 4.1- 4.2).

Check, therefore, in all cases the alignment and adjustment of the pump unit before starting.

ATTENTION !

CORRECT ALIGNMENT IS VERY IMPORTANT



To this purpose, measure the concentricity and the parallelism of the half coupling joints with a ruler and a thickness gauge after having removed the coupling guard.

Place the ruler in positions 1, 2, 3, 4 (see below picture) and check radial offset "a": it should not exceed 0,1 mm.

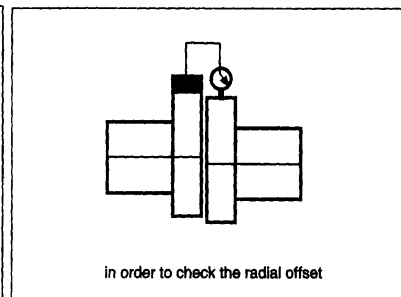
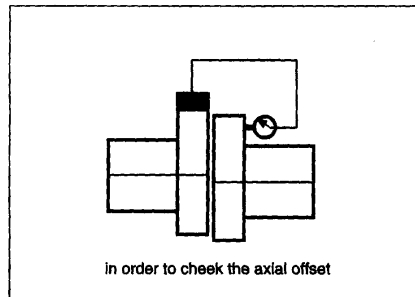
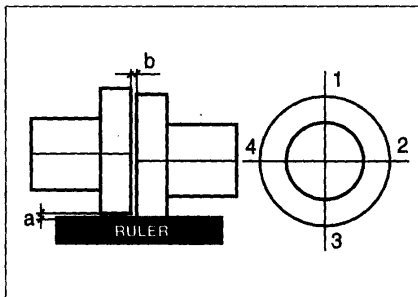
Measure then with a thickness gauge the distance "b" at positions 1, 2, 3, 4.

The difference between readings in positions 1-3 and 2-4 should not exceed 0,1 mm.

Group alignment can be checked more accurately by using a millesimal comparator (millesimal dial indicator).



AFTER ALIGNEMENT OPERATIONS THE COUPLING GUARD MUST BE FITTED ON BASEPLATE!



4.4 Electrical connections



Electrical connections should be made only by specialized personnel, strictly following the instructions of motor and electrical equipment manufacturers.

In case of three-phase current, make sure that voltage is the same in the three phase.



Connect motor earthing correctly.

Remove terminal board cover, connect electrical lines as shown in the picture inside the terminal board then put back the terminal board cover.

ATTENTION !

WE RECOMMEND TO INSTALL A SAFETY SWITCH UPSTREAM THE MOTOR TO PROTECT THE MOTOR AGAINST VOLTAGE DROP OR OVERLOAD.

PLEASE REFER TO VOLTAGE, FREQUENCY AND CURRENT DATA ON MOTOR NAMEPLATE FOR ITS CORRECT SIZING.

ATTENTION !

THE PUMP IS ALWAYS SHIPPED WITH BEARINGS HOUSING EMPTY , REMEMBER TO FILL IT WITH LUBRICATING OIL (refer to pos 6.1)

CHAPTER 5

5 - COMMISSIONING AND STARTUP

5.1 Startup

Before starting the pump unit, it is advisable to check the entire installation.

If any foreign objects could be contained in the pipes rinse the pipes or use temporary filters.

Check the oil level in the bearings housing and , if necessary, add oil.

- Check that
- motor is correctly connected
 - inlet pipe and the pump are filled with the medium
 - the pump shaft turns by hand
 - the inlet valve is open and the outlet valve is closed
 - water circulates freely in the cooling systems, if any

Open the valves to flux the shaft seal and all regulation control system, if any.

Check the correct direction of rotation, it is shown by an arrow on the pump housing.

Particulary, if the pump is equipped with a mechanical seal, the rotation should be checked when the motor is disconnected.

When pump is driven by an electric motor, if the direction of rotation is wrong, disjoint two electric cables and change the position in the terminal box.

Once the pump has been primed, close delivery gate valve, start the pump and open gradually the delivery gate valve (startup with closed gate valve reduces the initial transient voltage peak).

In case of hight temperature media, once the pump has been primed,it is indispensable to wait for the necessary time to carry all the pump components to the same temperature, to avoid anomalus frictions due to the different expansion of the various components.



Running with the valve closed more then one minute may cause media overheating leading to pump seizing.

Avoid dry running.

Check shaft seal;

The mechanical type should not leak

The packing type should leak 45-60 drops per minute.

The pump shoul operate according to its characteristics:

_Capacity _Head _Lift _Power consumption

_Revolution per minute _Voltage

As indicated on the pump and motor nameplates.

If necessary, partially close gate valve or adjust the intervention of pressure switches.

ATTENTION !

However, if any problem is detected during startup, stop immediately the pump and investigate the problem starting with the FAULT FINDING CHART CHAPTER 10 .

THE SYSTEM SHOULD BE FULLY COMPLETED BEFORE STARTING THE PUMP, ESPECIALLY FOR WHAT CONCERNS ELECTRICAL, MECHANICAL AN HYDRAULICAL COMPONENTS. ALL SAFETY SYSTEMS MUST BE CORRECTLY OPERATING.

NEVER START THE PUMP WITHOUT COUPLING GUARD!

CHAPTER 6

6 – MAINTENANCE

6.1 Ordinary maintenance

Once started the pump, check it as frequently as possible by means of plant instruments like pressure gauges, vacuum meters and ammeters. The pump needs normally no maintenance, except a periodical check to:

- Seal operation
- Bearing temperature and oil level.
- Leakage, unusual noise and excessive vibration

Packing seal

The quantity of leakage of medium should be sufficient to ensure correct cooling and lubrication of the packing and shaft sleeve; generally 45-60 drops a minute is correct.

If necessary vary the quantity by adjusting the packing follower and, if fitted, check for a correct flow of the flushing connections. If this adjustment has no effect, all the packing rings should be replaced.

If also the shaft sleeve is worn it should be replaced.

The number and dimensions of new packing rings must be the same of the original .

Mechanical seal

During the first running hours the mechanical seal can have small leak but after no leaks should occur.

The mechanical seal must be checked every 4.000 hours running; in case of leakage check the seal faces and the seal shaft sleeve that must be perfectly smooth, especially on seal O-Ring contact zone.

If it is worn should be replaced.

Bearings

It is very important to check the bearing operation, their temperature and the oil level.

Check bearing housing temperature: it can raise up to 50°C above the ambient temperature, but it should never exceed 90°C.

- For the first startup it is recommended to replace the oil after 50 hours running.
- Then every six months or after a long stop it is necessary to replace the oil.

Fill the bearing housing with oil up to the visual red point level; In case of oil level regulator (only on request), tilt it backwards, fill it up and close it.

OIL TYPE:

Use ISO VG-46 viscosity oil for bearing temperature from 0 to 70°C: AGIP OSO46 classification or equivalent

Use ISO VG-68 viscosity oil for bearing temperature from 70 to 90°C: AGIP OSO 68 classification or equivalent.

OIL QUANTITY:	BEARINGS BRAKET SIZE	
	1	~ 1,1 lt
	2	~ 1,6 lt.
	3	~ 2,3 lt.

6.2 Pump stop

Before stopping the pump unit it is necessary to:

- Close suction and delivery gate valves.
- Switch off line voltage.
- Leave the pump cool off in case warm liquid has been pumped.
- Drain the pump through the suited draining hole.(6B, 13B) when long stop periods or frost problems have to be faced.

CHAPTER 7

7 – PUMP DISASSEMBLING

7.1 Before disassembling the pump it is necessary to:

- Leave the pump cool off in case warm liquid has been pumped.
- Drain the pump through the suited draining hole.(6B, 13B)

7.2 Removing the pump from site

- Disconnect the auxiliary pipes, if any.
- Remove coupling guard and spacer, only if necessary, remove motor screws and lift the motor from its baseplate with a hoist.
- Remove foot of bearings bracket and bearings bracket with rotor assembly after having slackened the screws fastening it to its casing, pump casing can remain secured to its baseplate and to the pipings.
- Lift the assembly, use a hoist for lifting and moving it (see section 2).

Only if necessary to remove the bareshaft pump, remove bolts from suction and delivery flanges and lift the pump after having slackened the screws fastening it to its baseplate, use a hoist for lifting and moving it (see section 2).

We recommend to send the pump to an authorized shop or to the manufacturer.

To re-install the pump, please refer to sections 4 and 5.

7.3 Pump disassembling(rep to drwg. N°SMY0001, SMY0002, TMY0001, TMY0002)

Impeller dismantling

- Loosen the screws (6578.1) , unscrew the impeller nut (2912)
- Remove the impeller (2200) an key (6710).
- Impeller wear rings (2300.1)) , if necessary also casing wear rings (1500.1), can be removed by means of an extractor after removing of relevant screws.

Packing seal inspection

Remove in due order : Stuffing box housing (4110), screws (6576.1), nuts (6580.2), stuffing box flange(4119), stuffing box rings (4131), packing rings using an extractor (4130), shaft sleeve(2450) and gasket (4590.2)

Mechanical seal inspection

Remove in due order : Stuffing box housing (4110), screws (6576.1), nuts (6580.2) and complete cartridge mechanical seal (4200) (4212) after please refer to the mechanical seal manufacturer's intructions.

Bearings inspection

Dismantle as follows.

- Take off the throwers (2540.1) slackening the fastening screws (6578.2).
- Remove the cover pump side (3262) unscrewing the screws (6576.3)
- Remove the half couplig and the key (6742)
- Remove the cover (3261) unscrewing the screws motor side

Unscrewe the bearing lock nut (3712), withdraw the shaft (2100) and remove bearings from it.

7.4 After disassembling

Protect all the components that do not need to be reapiaced against damage, clean them by suitable cleaning agent and if the pump is not reassembled immediatly treat all uncoated surfaces with protective film of preserving oil.

CHAPTER 8

REASSEMBLING

Replace all worn components

Refer to DISASSEMBLING and proceed in the reverse order.

Start from bearings bracket and after reassemble shaft seal, stuffing box housing and impeller.

8.1 Before assembling

Check all mounting surfaces for defects, so that the original settings can be restored exactly without forcing.

Verify that shaft concentricity and deflection do not exceed 0,03 mm.

Verify the wear rings clearance, any clearance increase reduces pump performances, the clearances can be restored by replacing the wear ring.

8.2 Pump reassembling

Bearings assembling

If it is necessary replace the bearings use the same original type

The bearings should be mounted forced on the shaft and sliding in the housing.

For the other operations refer to disassembling

Packing seal assembling

The number and dimensions of new packing rings must be the same of the original ones.

For the other operations refer to disassembling

Mechanical seal assembling

Take particular care in this operation, due to the fragility of seal components

For assembling see Maker's instructions and refer to disassembling

Impeller assembling

Slide the impeller on the shaft, fasten it and refer to disassembling

Reassemblig of the unit

Insert the bearing bracket and rotor assembly in the pump casing, tighten the casing nuts and proceed in order:

Half coupling on the pump shaft, spacer, coupling guard and all flushing, cooling and washing circuits, if any.

With the motor coupled, check alignment, see pos. 4.2

CHAPTER 9

9.1 Spare parts (rep to drwg. N° SMY0001)

In order to guarantee a prompt maintenance service, we recommend to buy the following spare parts :

- Thrust bearings (3011)
- Radial ball bearing (3011.1)
- Casing wear rings (1510 / 1520)
- Impeller wear rings (2310 / 2320)
- Set of gaskets (4590 / 4590.1 / 4590.2)
- Shaft seal -cartridge mechanical seal (4200)
- Impeller (2200)
- Throtting sleeve (2430)
- Costant level oil (3855)
- Neck bush delivery side (4132)

9.2 Spare parts ordering

For a faster processing of your order, when ordering spare parts please specify:

- Pump type.
- Pump serial number
- Part name and number as listed on sectional drawing.

CHAPTER 10

10 - FAULT FINDING CHART

PROBLEM	PROBABLE CAUSE	REMEDY
<p>1</p> <p>pump gives no water</p>	<p>1.1 Pump and suction pipe not well primed, with suction pipe. air trapped in the system</p> <p>1.2 Air enters the system through suction pipe open taps or through foot valve not enough submersed.</p> <p>1.3 Foot valve clogged by The mud,leafs or other debris</p> <p>1.4 Defected foot valve allows water to pass through with loss of valve. suction power.</p> <p>1.5 Too high suction head</p> <p>1.6 Wrong rotation direction</p> <p>1.7The total head required by the system is higher than rated pump head.</p>	<p>Prime pump again</p> <p>Correct the installation</p> <p>Clean foot valve.</p> <p>Repair or change foot valve</p> <p>Correct the installation</p> <p>See par. 5.1.</p> <p>The pump is not suited to the duty required.</p>
<p>2</p> <p>Unsuufficient delivery</p>	<p>2.1 Foreign bodies at impeller channels or the same causes as points 1.1, 1.3, 1.5, 1.6, 1.7</p> <p>2.2 Undersized suction pipe or foot valve, or wrong positioning of suction pipe.</p> <p>2.3 Worn impeller and/or pump casing.</p>	<p>Clean impeller channels. See mentioned points and suggested remedies.</p> <p>Correct the installation</p> <p>Replace impeller Repair pump casing (see section 8)</p>
<p>3</p> <p>Unsuufficient pressure</p>	<p>3.1 Liquid viscosity higher than specified or the same causes as points 1.6, 1.7, 2.3</p>	<p>Pump not suited for operation with higher viscosity and/or see mentioned points and suggested remedies</p>

PROBLEM	PROBABLE CAUSE	REMEDY
<p>4</p> <p>excessive break power</p>	<p>4.1 pump performances are different than rated.</p> <p>4.2 liquid sg higher than specified.</p> <p>4.3 abnormal internal rubbing (rotating parts rub against fixed parts).</p>	<p>close partially the delivery gate valve.</p> <p>pump not suited to the service/ close partially the delivery gate valve.</p> <p>repair the pump - see section 8.</p>
<p>5</p> <p>the seal leaks excessively</p>	<p>5.1 worn seal.</p> <p>5.2 worn sleeve at seal position.</p>	<p>replace it(see section 8).</p> <p>repair the pump - see section 8.</p>
<p>6</p> <p>the pump vibrates and it is noisy</p>	<p>6.1 unbalanced rotating assembly.</p> <p>6.2 worn pump bearings.</p> <p>6.3 the pump runs with too low or too high capacity; also, the same causes as points: 1.5, 2.1, 2.2.</p> <p>6.4 pump and/or piping not firmly fastened</p>	<p>repair the pump - see chapter 8.</p> <p>see chapter 8.</p> <p>operate the pump differently; remove the causes of the problems.</p> <p>correct the installation.</p>

CHAPTER 11

11. DECOMMISSIONING AND DISMANTLEMENT

11.1: Dismantlement


When the pump will be permanently stopped and dismantled, the various components it should be properly disposed of. It is important to make sure that no residual polluting liquids are trapped within the pump.

The materials used in pump construction are:

- Steel and cast iron.
- Aluminium.
- Rubber and plastic.
- Copper and brass.

The disposal of polluting liquids and materials should follow current environment regulations.

SECTION AND PART LIST



POMPE CENTRIFUGHE MONOSTADIO DI PROCESSO - API 610
SINGLE STAGE CENTRIFUGAL PROCESS PUMPS - API 610

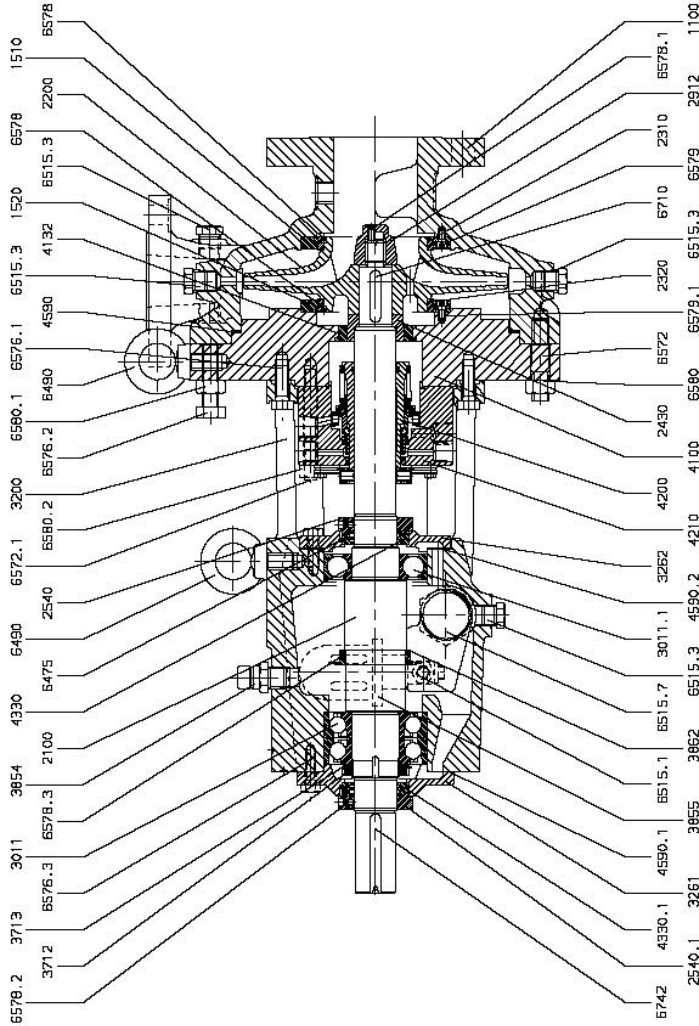
SMKM

DISEGNO IN SEZIONE
SECTION VIEW

SMY0001

03/01/00 DIS. L.A. DANR. G.B.

POS.	DENOMINAZIONE	DENOMINATION
1100	Corpo pompa	Pump casing
1510	Anello di tenuta sul corpo L. asp.	Casing wear ring, suction side
1520	Anello di tenuta sul corpo L. prem.	Casing wear ring, delivery side
2100	Albero	Shaft
2200	Girante	Impeller
2310	Anello di tenuta girante L. asp.	Impeller ring, suction side
2320	Anello di tenuta girante L. prem.	Impeller ring, delivery side
2430	Bussola di Fondo	Throttling sleeve
2540	Deflettore L. pompa	Thrower, pump side
2540.1	Deflettore L. comando	Thrower, drive side
2912	Dado bloccaggio girante	Impeller nut
3011	Cuscinetto reggispinna	Thrust bearing
3011.1	Cuscinetto radiale	Radial ball bearing
3200	Corpo del supporto	Bearing housing
3261	Coperchio cuscinetto, lato comando	Bearing cover, drive side
3262	Coperchio cuscinetto, lato pompa	Bearing cover, pump side
3712	Chiera bloccaggio cuscinetto	Bearing lock nut
3713	Rosetta ghiera blocco cuscinetto	Bearing nut washer
3654	Tappo riempimento olio	OIL FILLER PLUG
3855	Oliatore a livello costante	Constant level oiler
3862	Disco di lubrificazione	Lubricating disc thrower
4110	Scatola del premibreccia	Stuffing box housing
4132	Bussola di Fondo	Neck bush
4200	Tenuta meccanica	Mechanical seal
4212	Coperchio tenuta meccanica	Mechanical seal cover
4330	Anello di tenuta a Labirinto	Labyrinth ring, pump side
4330.1	Anello di tenuta a Labirinto	Labyrinth ring, drive side
4590/1/2	Guarnizione piana	Gasket
8475	Spina	Pin
8490	Golfana	Eyebolt
6515.1/3/7	Tappo	Drain plug
6572/1	Prigioniero	Stud
6576.1/2/3	Vite	Screw
6578/1/2/3	Grano	Grub screw
6579/1	Vite	Screw
6580/1/2	Dado	Nut
6710	Linguetta girante	Impeller key
6742	Linguetta giunto	Coupling key





POMPE CENTRIFUGHE DI PROCESSO API 610
CENTRIFUGAL PROCESS PUMPS API 610

SMKM

TMY0001

REVISIONE

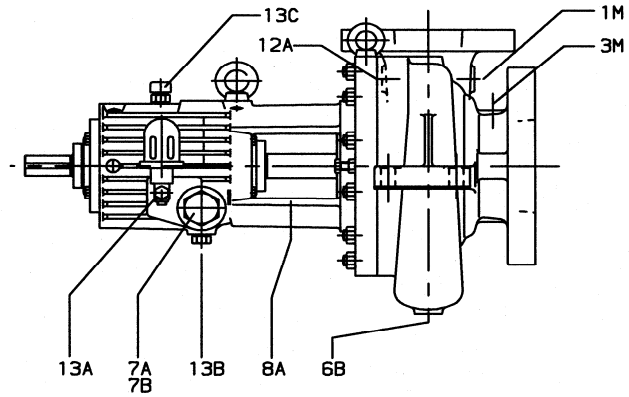
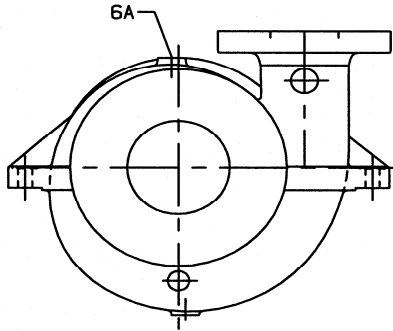
A

DATA
20/01/00

DIS.
L. A.

CONTR.
G. B.

CONNESSIONI
 CONNECTIONS



Filettato secondo ASA B2.1
 Thread according to ASA B2.1

Conessioni
 Connections

Pompa tipo / Pump type

1 1/2x2x6L	1 1/2x2x6H	1 1/2x2x8L	1 1/2x2x8H	1 1/2x3x9	2x3x6L	2x3x6H	2x3x8L	2x3x8H	2x3x10L	2x3x10H	3x3x6	3x4x6	3x4x8L	3x4x8H	3x4x8HH	4x6x6	4x6x8L	4x6x8H	3x4x10	4x6x10L	4x6x10H	8x10x9
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Supporto / Bearing bracket

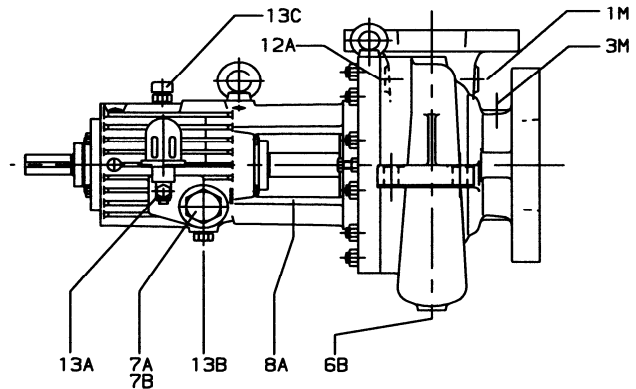
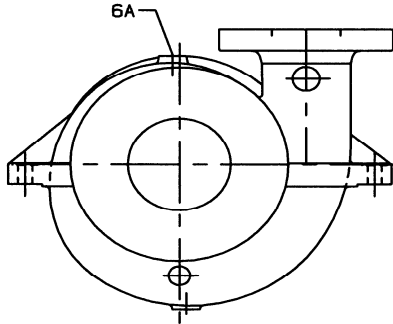
BB01

1M	Manometro Pressure gauge		1/2"
3M	Manovacuometro Pressure vacuum gauge		1/2"
6A	Sfiato corpo pompa Casing vent	1/2"	3/4"
6B	Spurgo corpo pompa Casing drain	1/2"	3/4"
7A/B	Entrata/Uscita Liquido raffredd. Cooling Liquid Inlet/Outlet		1 1/2"
8A	Scarico liquido di gocciolamento Seal leakage hole		1/2"
12A	Circolazione liquido in uscita Circulation liquid outlet		1/2"
13A	Regolatore livello olio Constant level oiler		1/4"
13B	Uscita olio Oil Drain		1/2"
13C	Tappo di sfiato Vent plug		1/2"

ATA LA COPIA, LA RIPRODUZIONE E LA CESSIONE A TERZI A NORMA DI LEGGE



CONNESSIONI
CONNECTIONS



Filettato secondo ASA B2.1
Thread according to ASA B2.1

Conessioni
Connections

Pompa tipo / Pump type

2x3x12	2x3x13	3x4x13	4x6x13	6x8x11	6x8x12L	6x8x12H	6x8x13	4x6x15	6x8x15	6x8x18	6x8x21	10x10x16	10x12x18	12x12x14
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Supporto / Bearing bracket

BB02

BB03

1M	Manometro Pressure gauge														1/2"	
3M	Manovacuumetro Pressure vacuum gauge															1/2"
6A	Sfiato corpo pompa Casing vent	1/2"														3/4"
6B	Spurgo corpo pompa Casing drain	1/2"														3/4"
7A/B	Entrata/Uscita Liquido raffredd. Cooling Liquid Inlet/Outlet															1 1/2"
8A	Scarico Liquido di gocciolamento Seal leakage hole															1/2"
12A	Circolazione Liquido in uscita Circulation Liquid outlet															1/2"
13A	Regolatore Livello olio Constant level oiler															1/4"
13B	Uscita olio Oil Drain															1/2"
13C	Tappo di sfiato Vent plug															1/2"

VIETATA LA COPIA, LA RIPRODUZIONE E LA CESSIONE A TERZI A NORMA DI LEGGE

DICHIARAZIONE DI CONFORMITA'
(secondo allegato II A - Direttiva Macchine 2006/42/CE)
DECLARATION OF CONFORMITY
(according to enclosure II A - Machinery Directive 2006/42/EC)

Sezione 1
Section 1

DESCRIZIONE MACCHINA
Machinery Description

Costruttore
Manufacturer

GRUPPO ATURIA S.p.A.

Tipo
Type

SMKM

Descrizione
Description

Elettropompa centrifuga di processo API 610
API 610 Centrifugal process electric pump

Sezione 2
Section 2

NORME / DIRETTIVE APPLICABILI
Applicable Directives / Standards

Direttiva Macchine 2006/42/CE
Machinery Directive 2006/42/EC

Norma Armonizzata UNI EN 809
Harmonised Standard *UNI EN 809*

Sezione 3
Section 3

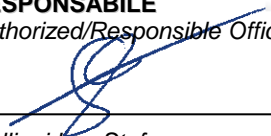
DICHIARAZIONE
Declaration

Noi, Gruppo Aturia S.p.a. /Piazza Aturia,9 /Gessate/ Mi/, dichiariamo che é garantita la conformità ai requisiti essenziali di sicurezza e di tutela della salute della Direttiva Macchine 2006/42/CE.

We, Gruppo Aturia S.p.a. /Piazza Aturia,9/Gessate/ Mi/, declare that is in conformity with all the essential health and safety requirements of the Machinery Directive 2006/42/CE.

RESPONSABILE
Authorized/Responsible Officer

Firma
Signed



data/date: 04/2010

Gallieni Ing. Stefano

Qualifica
Title

Direttore Generale
General Manager

Persona Giuridica Responsabile del Fascicolo Tecnico
Legal Person Responsible of Technical File

Gruppo Aturia S.p.A.
P.zza Aturia, 9 – 20060 Gessate (MI) - Italy

GRUPPO ATURIA s.p.a. - 20060 - Piazza Aturia, 9 Gessate, Mi (Italy) Tel.02/95423.200 - Fax. 02/95423.202

