

A measured step forward™

Operations & Maintenance Manual

CENTRAN AM



Identification Code												
Pump Data							Motor Data					
Range	Model	Execution (Materials)		O-Ring Material	Guide	Connections	rpm	Motor	Voltage	Phases	Powers	
AM	<input type="checkbox"/> 250	<input type="checkbox"/> GX (CFF-E-CTFE)			R1 (C/AI203 N1 (GFR-PTFE/AI203))	B (BSP threaded)					0.18 kW	
	<input type="checkbox"/> 350											C
	<input type="checkbox"/> 500				H	V(FPM)	R2 (C/SiC)		Z (ISO-ANSI-JIS flange)	2900	N (std V)	
	<input type="checkbox"/> 250P											K
	<input type="checkbox"/> 350P	L	K(FFKM)	X2 (SiC/SiC)	U (NEMA)	E (Ex-proof)	1 (1 phase)					
	<input type="checkbox"/> 500P							<input type="checkbox"/> GF (CFF-E-CTFE)				
Year of Manufacture			Part Number									

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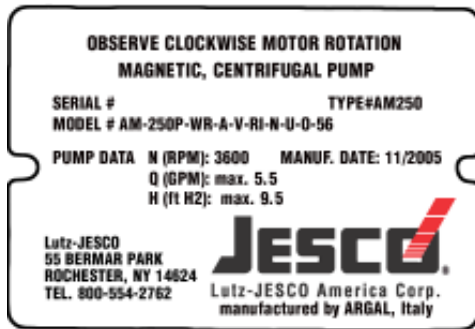
Maintenance
Date of commissioning
Position / system reference
Service

Dealer

Identification Codes

Each pump is supplied with the serial and model abbreviation and the serial number on the rating plate, which is riveted onto the support side. Check data upon receiving the goods. Any discrepancy between the order and the delivery must be reported communicated immediately.

In order to be able to trace data and information, the abbreviation, model and serial number of the pump must be quoted in all correspondence.



General Notes

CENTRAN AM pumps are designed and built for the transfer of liquid chemical products having a specific weight, viscosity, and temperature. These criteria must be appropriate for use with centrifugal pumps in a fixed installation, from a tank at a lower level to a tank or a pipe to a higher level. The characteristics of the liquid (pressure, temperature, chemical reactivity, specific weight, viscosity, vapor tension) and the ambient atmosphere must be compatible with the characteristics of the pump and defined upon ordering.

The pump's maximum performances (capacity, head, rpm) are defined on the identification plate.

CENTRAN AM pumps are centrifugal, horizontal, single stage, coupled to a non-synchronous electric motor via a magnetic coupling, with axial inlet and radial outlet for connection to the hydraulic system. They are foot-mounted for floor mounting.

CENTRAN AM pumps are not self priming.

R execution CENTRAN AM pumps can occasional run dry.

The liquid to be pumped must be clean for the R execution. The X execution may contain solid (% dimension and solid part hardness must be agreed upon when ordering).

Pump rotation must be clockwise as observed from the motor end of the unit.

Make sure that the chemical and physical characteristics of the

liquid have been carefully evaluated for pump suitability.

The specific weight that can be pumped at a temperature of 77°F (both of the ambient and of the liquid) depends upon the impeller diameter (shown on the identification plate) and the type of construction.

Normal construction:

1.10 kg/dmc	impeller A (maximum diameter)
1.40 kg/dmc	impeller C (maximum diameter)

Heavy duty construction "P":

1.40 kg/dmc	impeller A (maximum diameter)\
1.90 kg/dmc	impeller C (maximum diameter)

The specific weight that can be pumped at 158°F is 10% less than that at 77°F.

The level of kinematic viscosity must not exceed 40 cSt so as not to significantly modify the pump's performance. Higher values up to a maximum of 100 cSt are possible provided that the pump is equipped with suitable impeller to be defined upon ordering.

The maximum continuous working temperature referred to water depends on the choice of materials (specified on the identification plate):

176°F	execution WR
203°F	execution GF

The ambient temperature interval is related to the choice of materials (specified on the identification plate):

32- +104°F	execution WR
-4 - +104°C	execution GF

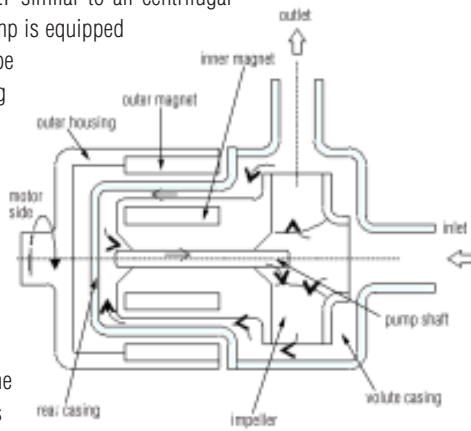
The maximum pressure the pump may be subjected to is 1.5 times the head valve developed with the outlet closed.

The vapour pressure value of the liquid to be pumped must exceed (by at least 1m w.c.) to the difference between the absolute total head (suction side pressure added to the positive suction head, or subtracted by the suction lift) and the pressure drops in the suction side piping (including the inlet NPSHr drops shown on the specific tables).

The pump does not include any check valve, any liquid flow control, or motor stop device.

Operating Principle

HYDRAULICALLY similar to all centrifugal pumps, this pump is equipped with a blade-type impeller rotating within a fixed housing. It has a tangential outlet (or radial with an internal deflector) and, by creating a depression in the center, it allows the liquid to flow from the central suction side. Then, flowing through the impeller's blades, the fluid acquires energy and is conveyed towards the outlet.



MECHANICALLY different from the traditional centrifugal pumps, impeller motion is created using the magnetic field between the primary outer magnet and the inner magnet (not visible because housed inside the impeller hub). The magnetic field crosses the plastic parts and the liquid, and firmly couples the two magnet assemblies. When the motor causes the outer magnet to rotate together with its housing, the inner magnet assembly is dragged at the same speed. As a result the impeller, which is integral to it, is maintained in rotation.

The SHAFT, totally within the housing, is not involved in the transmission of rotary motion; its only function is to act as a centering guide and support for the impeller. To this end the components are designed so that a spontaneous cooling circuit (due to a simple effect of pressure) is established to cool the surfaces subject to friction. Periodic inspections and cleaning prevent the build-up of sediments between the shafts and the guide bushes significantly lengthening their working life.

Motor

The protection level of CENTRAN AM motors is IP 54.

The initials IP are followed by two numbers:

The first number indicates the level of protection against penetration of solid objects and in particular:

- 4 - for solids whose dimension is greater than 1 mm
- 5 - for dust (eventual internal deposits will not harm operation)
- 6 - for dust (no penetration)

The second number indicates the protection against the penetration of liquids. In particular:

- 4 - for water sprays from all directions
- 5 - for jets of water from all directions
- 6 - for tidal and sea waves

According to the IP protection indicated on the identification plate of the motor and to the environmental conditions, arrange for opportune extra protections allowing in any case correct ventilation and rapid drainage of rainwater.

Dry Running Survey

Though the pump can occasionally run dry, it is strongly recommended to safeguard the pump and the plant by use of:

- in-line fluid pressure switch;
- fluxmeter;
- control devices for the motor power absorption.

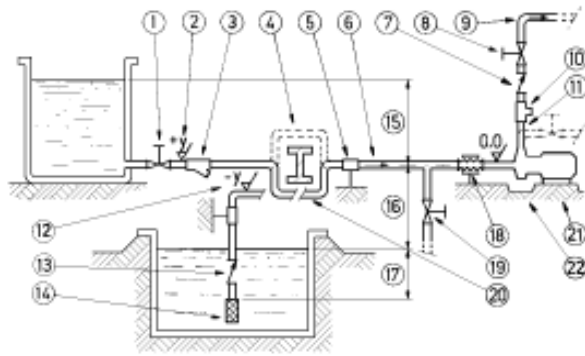
Instructions on Installation and Use

Transport

- cover the hydraulic connections
- when lifting the unit do not exert force on the plastic fittings
- lay the pump on its base or mounting plate during transport
- protect the pump by means of adequate shock absorbing supports as bumps and shocks may damage important working parts vital for safety and functionality

Installation

- clean the plant before connecting the pump.
- make sure that no foreign bodies are left in the pump. Remove safety caps from the hydraulic connections.
- follow the instructions indicated in the following diagram:
 1. YES: gate valve (may also be near pump in the case of long piping)
 2. With positive head: invert piping towards pump
 3. YES: line strainer (3-5 mm mesh)
 4. NO: air pockets: the circuit must be short and straight
 5. YES: pipe supports
 6. Fluid speed suction: 2.5 m/s
 7. YES: check valve (especially for long vertical or horizontal pipes; compulsory with parallel pumps).
 8. YES: adjusting gate valve on outlet
 9. speed of delivered fluid: 3.5 m/s max.
 10. YES: in-line gauge or safety pressure switch
 11. NO: elbows (and other parts) on the pump (discharge and suction lines)
 12. With negative suction lift: invert piping towards suction tank
 13. YES: check valve (with negative suction lift)
 14. YES: strainer (3-5 mm mesh)
 15. Suction head varies according to flow in order to prevent windage (min. 0.5 m, max. 15% of pump head)



- 16. Suction head, 3 m max.
- 17. Immersion depth: 0.3 m min.
- 18. YES: pulsation dampener (indispensable with long pipes or hot liquids) and/or anti-vibration discharge and suction; located near to pump
- 19. YES: drain pipe (completely sealed), drain valve shut during normal operations
- 20. YES: overcoming obstacles at lower depths.
- 21. Secure the pump by the mounting holes provided: the supports must be level
- 22. YES: drainage channel around base
- secure the pump to an adequate base plate having a mass at least 5 times that of the pump
- do not use anti-vibration mounts to secure the pump
- anti-vibration joints are recommended on the pipe connections
- make sure that the power supply is compatible with the data shown on the pump motor identification plate
- connect the motor to the power supply via a thermal control switch
- install emergency stop devices to turn off the pump in case of low liquid level (floating, magnetic, electronic, pressure-sensitive)
- ambient temperature as a function of the physical-chemical characteristics of the liquid to be pumped and in any case not greater or lower than the interval indicated in GENERAL NOTES
- other environmental conditions in accordance with the protection of the motor
- install a drainage pit to collect any liquid overflow from the base drainage channel due to normal operation and maintenance work
- leave enough free space around the pump for a person to move
- leave free space above the pump for lifting operations
- highlight the presence of aggressive liquids with colored tags following the local safety regulations
- do not install the pump (made in thermoplastic material) in close proximity to heating system
- do not install the pump in areas subject to solid or liquid matter falling
- do not install the pump in an explosive atmosphere
- do not install the pump in close proximity to workplaces or crowded areas
- install extra protection guards for the pump or persons as the need arises
- install a spare equivalent pump in parallel

Start-Up

- verify that the instructions outlined in the INSTALLATION have been followed
- verify the correct direction of rotation (clockwise from the motor fan side) supplying the motor with short impulses
- ensure that the NPSH available is greater than that required by the pump (in particular for hot liquids, liquids with high vapor pressure, very long suction pipes or negative suction lift)
- close the drain valve (pos. 19); totally flood the suction pipe and the pump
- start the pump with the suction valve completely open and the discharge valve partially closed
- slowly regulate the flow by opening or closing the discharge valve (never the suction valve). Make sure that the power absorbed by the motor does not exceed the rating indicated on the motor identification plate
- do not operate the pump at the limit values of its performance curve: maximum head (discharge valve excessively closed) or maximum capacity (total absence of drops and geodetic head on the discharge side)
- set the operating point to that for which the pump was requested
- ensure that there are no abnormal vibrations or noise due to inadequate mounting or cavitation
- avoid short and/or frequent starts by properly setting the control devices
- ensure that the temperature, pressure and liquid characteristics are as those specified at the time of order
- **WARNING!** At the start-up be sure that all the internal hydraulic parts are not in CCW rotation (the cooling fan of the motor must stand or CW rotate), to prevent decoupling among magnetic driven parts of the pump; if the CCW rotation is due to the feedback of the liquid in the discharge side, add a no-return valve in the plant.

Use

- switch automatic control on
- do not activate valves during pump operation
- risks of dangerous water hammer effects in case of sudden or improper valve actuation (only trained personnel should operate valves)
- completely empty and wash the pump before using a different liquid
- isolate or empty the pump if the crystallization temperature of the liquid is the same or lower than the ambient temperature
- stop the pump if the liquid temperature exceeds the maximum allowed temperature indicated in the general notes; if the increase is of approximately 20%, check internal parts
- close the valves in case of leaks
- wash with water only if compatible with the chemical being used. Alternatively, use an appropriate solvent that will not generate dangerous exothermal reactions
- contact the liquid supplier for information on the appropriate fire precautions
- empty the pump during long periods of shutdown (in particular with liquids which easily crystallize)

Shutdown

- disconnect the motor
- before starting maintenance, turn off the suction and discharge valves

Maintenance

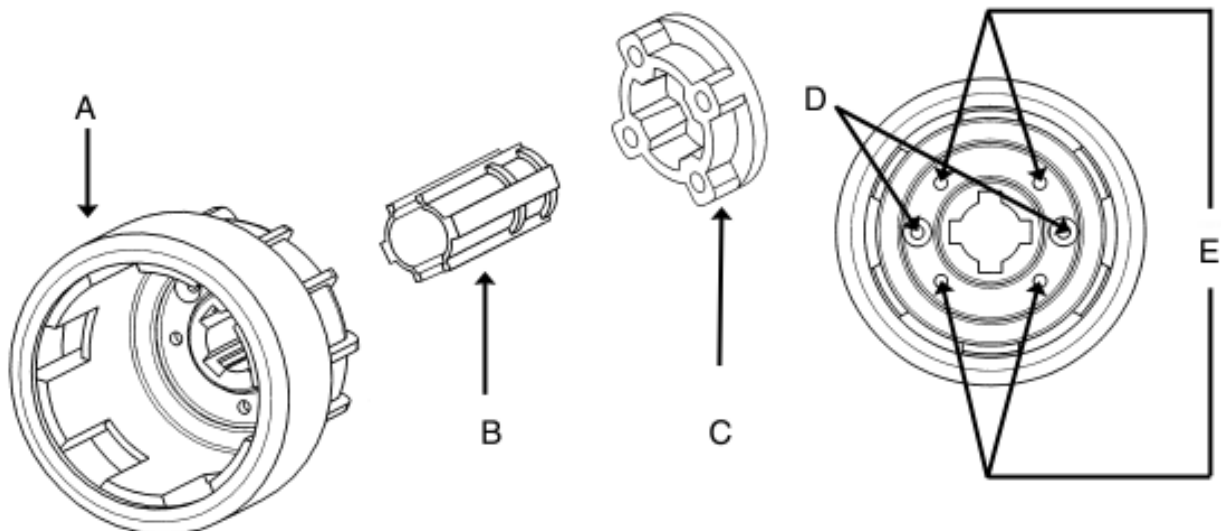
all these maintenance operations must be performed under the supervision of qualified personnel

- make periodic inspections (2 to 6 months depending on the type of liquid and the operating conditions) on the rotating parts of the pump; clean or replace as necessary
- make periodic inspections (3 to 5 months depending on the type of liquid and the operating conditions) on the functionality of the motor control system; efficiency must be guaranteed
- make periodic inspections (2 to 30 days depending on the type of liquid and the operating conditions) of the in-line and foot filters as well as of the bottom valve
- the presence of liquid below the pump could be a clue to pump problems
- excessive current consumption could be an indication of impeller problems
- unusual vibrations could be due to unbalanced impeller (due to damage or presence of foreign material obstructing its blades)
- reduced pump performance could be due to an obstruction of the impeller or damages to the motor
- motor damage could be due to abnormal friction within the pump
- damaged parts must be replaced with new original parts
- the replacement of damaged parts must be carried out in a clean dry area

Disassembly

- Tools required: size 8 mm adjustable wrench, cross cogging screw driver, punch $\varnothing < 4\text{mm}$. Bolts have right-hand thread
- all these maintenance operations must be performed under

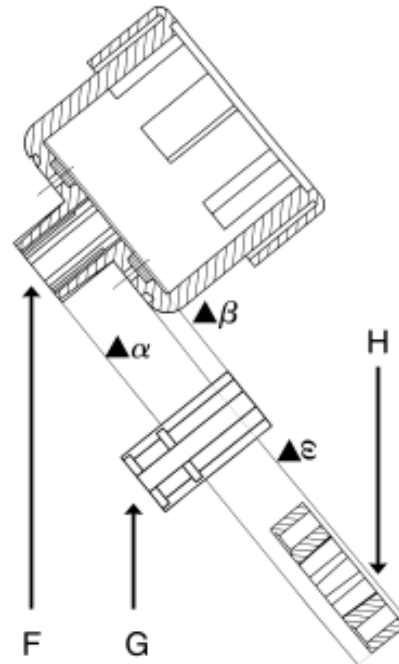
- supervision of qualified personnel
- remove the power supply from the motor and disconnect the electrical wiring; pull the wires from the terminal box and isolate them accordingly
- close the suction and discharge valves and open the drain valve
- use gloves, safety glasses and acid-proof overalls when disconnecting and washing the pump
- disconnect the piping and leave enough time for the residual liquid to exit the pump body and atmospheric air to fill the empty volume
- wash the pump before carrying out any maintenance work
- do not splash the liquid in the environment
- before attempting to dismantle the pump ensure that its motor is disconnected and that it cannot be started accidentally
- before the inspection, check that you have spare O-rings ready to hand for re-installing at the end of operations
- **Warning:** tools are attracted by operations near the magnet. Proceed with caution to avoid damage.
- position the pump in a vertical position (inlet side up) during dismantling during dismantling.
- open the pump following the sequence indicated in the respective table of the LEGEND.
- the separation between the volute casing – impeller – rear casing is carried out by simply unscrewing the six M5 screws, take care during the operation to not damage the Al_2O_3 or SiC components.
- remove the rear casing to reach the drive magnet assembly with 4 phillips screws; unscrew the 4 screws (pos. E in pic.) and insert the punch in the hole (pos. D in pic.) to extract the collar (pos. C in pic.) from the drive magnet assembly tang.
- after removing the collar, unthread the drive magnet assembly, sockets and collar (pos. A, pos. B, pos. C in pic.) from the motor shaft.



Inspection

Check:

- the pump shaft for cracks and excessive wear
- guide bushing for excessive wear ($\cong 5\%$)
- counterthrust bushing for cracks or excessive wear
- pump shaft clutch
- that the guide bushing cooling circuit is not blocked
- the impeller, volute and rear chamber for abrasion and corrosion
- that the pressure balancing holes on the impeller blades are not blocked
- for lumps and clusters created by the pumped liquid (especially at the bottom the rear chamber)
- for infiltration of liquid into the chamber containing the inner magnets
- abrasions on the outside surface of the reinforcement chamber due to scratching of the outer magnets
- replace broken, cracked or deformed parts.
- reopen all the blocked pipes and eliminate any chemical agglomeration.
- clean all the surfaces before re-assembly, especially O-ring seats to prevent the risk of drip leaks

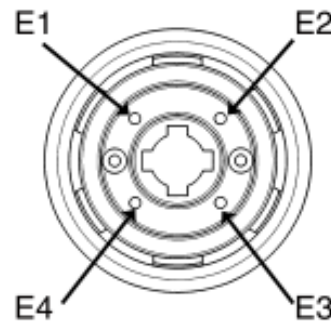


Assembly

- Tools required: size 8 socket spanner, cross cogging screw driver.
- Bolts have right-hand thread

Bolt torque setting:	M4	M6	M8	M10	
(reduce by 25% on plastic parts)	Nm	4	14	24	25

- all these maintenance operations must be performed under supervision of qualified personnel
- before the inspection, check that you have spare o-rings ready to hand for re-installing at the end of operations
- now open the pump following the sequence indicated in the respective table of the legend
- insert possible **sockets** (pos. g in pic.) into the **drive magnet assembly tang** (pos. f in pic.)
- the relative position between the **drive magnet assembly and the sockets is shown by the α ϵ β plans in the picture.**
- insert the collar (pos. h in pic.) on the drive magnet assembly tang, the collar side where are visible brass inserts have to be located to the pump side and as far as possible from the ϵ plan
- insert the assembly group (**drive magnet assembly, sockets, collar**) on the motor shaft (during the group insertion verify that the relative position between the sockets and the **drive magnet assembly** remain the same, the sockets (pos. g) and drive magnet assembly (pos. f) must be located as **shown** in the picture
- screw the **4** cross cogging screws sharing the operation in more than one phase, repeat the sequence e1, e2, e3, e4 (torque $\cong 6$ n m)
- don't insert the impeller freely into the **drive magnet assembly**
- during the impeller insertion take care not to damage the Al_2O_3 -SiC-C HD components



Safety Risks

WARNING! MAGNETIC FIELDS.



Magnetic pumps contain some of the most powerful magnets in existence. The magnets are positioned on the back of the impeller and the outer magnet housing. The magnetic fields may adversely affect persons fitted with electronic devices (e.g. pacemakers and defibrillators). Such persons must not be allowed to handle magnetic pumps and magnetic pump components. Individuals with internal surgical clips, metallic wiring, or other metallic prosthetic devices must not be allowed to handle magnetic pumps and magnetic components.



WARNING! MAGNETIC FORCE.

Exercise extreme caution and follow instructions carefully during pump assembly/disassembly. The strong magnetic field can cause tools and parts to slam together, injuring hands and fingers.



WARNING! CHEMICAL HAZARD.

The pumps are designed to pump different types of liquid and chemical. Follow the specific instructions to decontaminate during inspection or maintenance.



WARNING!

Safety risks for personnel mainly arise from improper use or accidental damages.

These risks may be of an electrical nature as far as the non-synchronous motor is concerned and may cause injury to hands if working on an open pump. Risks may also arise due to the nature of the liquids pumped. It is therefore of utmost importance to closely follow all the instructions contained in this manual so as to eliminate the causes that may lead to pump failure and the consequent leakage of dangerous liquid for both personnel and the environment.

Risks may also arise from improper maintenance or dismantling practices.

In any case five general rules are important:

1. all services must be carried out by specialized personnel or supervised by qualified personnel depending on the type of maintenance required
2. install protection guards to prevent liquid sprays (when the pump is not installed in remote areas) due to an accidental pipe rupture. Arrange for safety basins to collect possible leakage
3. when working on the pump always wear adequate personal protective clothing
4. arrange for proper conditions for suction and discharge valve closing during disassembly
5. make sure that the motor is completely disconnected during disassembly.

Proper design and construction of plants, with well positioned and well marked piping and shut-off valves, adequate passages and work areas for maintenance and inspection are extremely important since the pressure developed by the pump could damage the plant as a result of faulty installation or normal operational wear and tear.

It must be stressed that the major cause of pump failures leading to a consequent need for repair is due to the pump running dry in manually operated plants. This is generally due to:

- the suction valve being open at start-up or
- the suction tank being emptied without stopping pump operation

Installation and Commissioning Personnel

Installations must be performed by qualified personnel who are properly trained in their fields. They may eventually delegate to others some operations depending on specific evaluations (technical capability required: specialization in industrial plumbing or electric systems as needed).

Operators and Maintenance Personnel

Operations allowed to be performed by general operators (after training on the correct use of the plant) include:

- pump starting and stopping
- opening and closing of valves with the pump at rest
- emptying and washing of the pump body via special valves and piping
- cleaning of filtering elements

Operations allowed to be performed by qualified personnel (technical capabilities required: general knowledge of the mechanical, electrical and chemical features of the plant being fed by the pump and of the pump itself) include:

- verification of environmental conditions
- verification of the condition of the liquid being pumped
- inspection of the control/stop devices of the pump

- inspection of the rotating parts of the pump
- trouble shooting

Repair Personnel

Operations allowed to be performed by general operators under the supervision of qualified personnel include:

- stopping of the pump
- closing of the valve
- emptying of pump body
- disconnection of piping from fittings
- removal of anchoring bolts
- washing with water or suitable solvent as needed
- transport (after removal of electrical connections by qualified personnel)

Operations allowed to be performed by qualified personnel (technical capabilities required: general knowledge of machining operations, awareness of possible damage to parts due to abrasion or shocks during handling, know-how of required bolt and screw tightening required on different materials such as plastics and metals, use of precision measuring instruments) include:

- opening and closing of the pump body
- removal and replacement of rotating parts

Waste Disposal

Materials: separate plastic from metal parts. Dispose of by authorized companies.

Improper Use

The pump must not be used for purposes other than the transfer of liquids.

The pump cannot be used to generate isostatic or counter pressures.

The pump cannot be used to mix liquids generating an exothermal reaction.

The pump must be installed horizontally on a firm base.

The pump must be installed on a suitable hydraulic plant with inlet and outlet connections to proper suction and discharge pipes.

The plant must be able to shut off the liquid flow independently from the pump.

Handling of aggressive liquids requires specific technical knowledge

Troubleshooting

Condition: Pump does not deliver

1. motor rotates in wrong direction
2. suction pipe is excessively long
3. insufficient geodetic pump head or excessive suction geodetic lift
4. air infiltration into the suction pipe or branches
5. pump or suction pipe not completely covered by liquid
6. impeller channels blocked by impurities
7. check valve on discharge pipe jammed
8. geodetic system height is greater than maximum potential pump head
9. impeller jammed by crystals or by melting of materials during dry operation.
10. suction line blocked by mud or other debris
11. foot valve insufficiently immersed
12. suction valve faulty, thereby causing suction valve to empty when pump stops
13. magnets release a much greater specific weight and flow rate of liquid than planned
14. magnets release during start-up while impeller is CCW moving (feed-back of the liquid in the discharge side)

Condition: Pump discharge rate or pressure insufficient

see 01, 02, 03, 04, 05, 06, 10, 11, 12, 13

15. system's discharge head is greater than expected
16. suction pipe, closing valve and other items have an insufficient nominal diameter
17. small geometric pump suction head
18. damaged or worn impeller
19. liquid viscosity greater than expected
20. excessive air or gas in liquid
21. elbow joints, check valves or other items restrict the outlet port flow
22. liquid (especially if hot) with tendency to change into gaseous state

Condition: Pump absorbs too much power

see 19

23. pump operates at greater capacity than expected
24. specific weight of liquid is greater than expected
25. impurities inside pump create abnormal wear
26. electric motor supply voltage is not rated voltage

Condition: Pump vibrates and is noisy

see 25

27. operates at full capacity (no head)
28. pump or pipes inadequately supported
29. eccentric impeller operation because of worn bushings

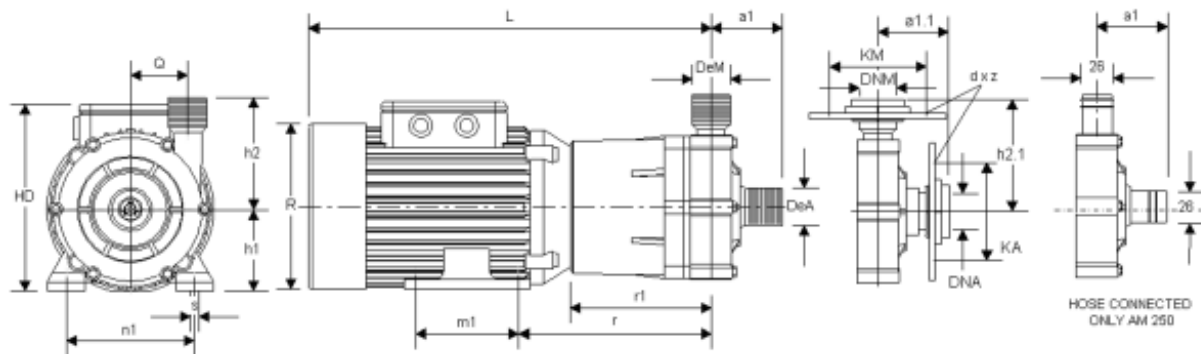
Condition: Pump's internal parts wear out too quickly

see 25

30. liquid excessively abrasive
31. recurring cavitation problems (see 02, 15, 19, 17)
32. high tendency of liquid to crystallize or polymerize when pump is not operating.
33. pump made of materials that are unsuitable for pumped liquid
34. operation with capacity reduced too much

CENTRAN AM Technical Data

CENTRAN AM	250 N	250P	350N	350P	500N	500P
dB	58		62		65	
KW	0.18	0.25	0.25	0.37	0.37	0.55
HP	0.25	0.35	0.35	0.5	0.5	0.75
De M	3/4" m		1" m		1-1/4" m	
De A	3/4" f*		1" m		1-1/4" m	
a1	62		62		62	
a1.1	70		70		70	
L	312		312	330	330	
HD	140		140	165	165	
Q	47		49		53	
h1	63		63	71	71	
h2	100		100		100	
h2.1	108		108		108	
s	Z 6		Z 6	Z 7	Z 7	
r	160		160	170	170	
r1	123		123		123	
R	Z 125		Z 125	Z 140	Z 140	
m1	80		80		90	
n1	100		100	112	112	
KM (SIO)	75		85		100	
KA (ISO)	75		85		100	
KM (ANSI)	70		79		89	
KA (ANSI)	70		79		89	
d x z (ISO)	14 x 4		14 x 4		14 x 4	
d x z (ANSI)	16 x 4		16 x 4		16 x 4	
Peso Kg	8		10	11	11	
loads (ports-section)	max. single strength value F (x;y;z) = 2					
dynamic loads (base)	4.5					
max. head 1) w.c. meter	9.5		11		10.5	
max. capacity 1) m ³ /h	5.5		9		11	
max. NPSH req. 2) w.c. meter	3		4		3	
Dimensions in mm; weight and loads in kg:					*) female connection	
BSP or NPT parallel thread on the hydraulic connections					1) ref. to impeller A	
Centre of gravity along the motor axis, in the middle of dimension - L -					2) ref. to max. capacity	



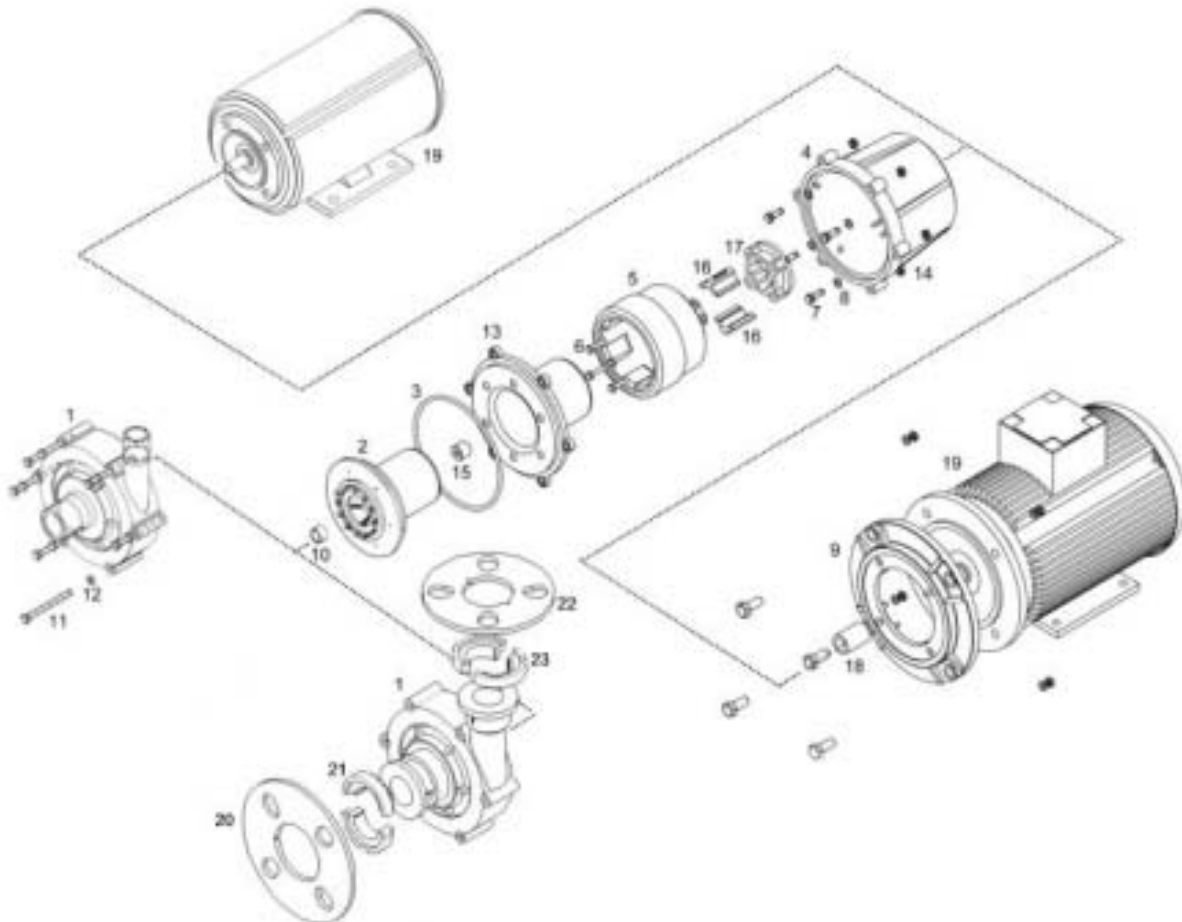
Contractual Data

Technical Data

Medium _____
 conc. % _____ tem _____
 capacity m³/h _____ head m _____

Code Number Configuration

AM	250P	WR	H	V	R1				
AM Series	Chosen model	See materials & construction	See performance curves	V=FKM E=EPDM K=FFKM	See performance curves	B=thr. BSP N=thr. NPT Z=flange ANSI P=hose	U=NEMA	N=Std. S=Spec. V E=Ex-proof O=No motor	3=3 phase 1=1 phase
Series	Model	Version	Impeller	O-ring Material	Internal Structure	Connection	Standard Motor	Data Motor	Motor Phases
AM	250P	WR	H	V	R1				
	350P	GF	K	E	X1				
	500P		L	K	N1				



Parts List

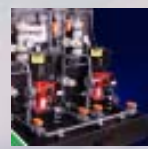
Item No.	Description	Code	Qty.	Part Number			Spare Stock	
				Model 250P	Model 350P	Model 500P	2 yrs	5 yrs
1	Volute casing (See Version)	WR	1	41325WR	41335WR	41350WR	---	1
		GF	1	41325GF	41335GF	41350GF	---	1
2	Impeller for WR (See Impeller Type & Version)	H	1	41425WR	41435WR	41450WR	1	1
		K	1	41525WR	41535WR	41550WR	1	1
		L	1	41625WR	41625WR	41650WR	1	1
2	Impeller for GF (See Impeller Type & Version)	H	1	41425GF	41435GF	41450GF	1	1
		K	1	41525GF	41535GF	41550GF	1	1
		L	1	41625GF	41625GF	41650GF	1	1
3	O-Ring (See O-Ring Material)	V	1	41725V	41735V	41750V	1	2
		E	1	41725E	41735E	41750E	1	2
		K	1	41725K	41735K	41750K	1	2
4	Support	---	1	41825	41835	41850	---	---
5	Drive Magnet Assembly	---	1	41925	41935	41950	---	---
6	Screw (Magnet-Assembly)	---	4	42025	42035	42050	---	---
7	Screw (Support Flange)	---	4	42125	42135	42150	---	---
8	Washer	---	4	42225	42235	42250	---	---
9	Motor Lock Flange	---	1	42325	42335	42350	---	---
10	Front Guide Bushing (See Internal Structure)	R1 / R2	1	42425R	42435R	42450R	1	2
		X1 / X2	1	42425X	42435X	42450X	1	2
		N1 / N2	1	42425N	42435N	42450N	1	2
11	Casing Screw	---	6	42525	42535	42550	---	---
12	Washer	---	6	42625	42635	42650	---	---
13	Rear Casing (See Version)	WR	1	42725WR	42735WR	42750WR	---	1
		GF	1	42725GF	42735GF	42750GF	---	1
14	Nut	---	6	42825	42835	42850	---	---
15	Back Guide Bushing (See Internal Structure)	R1 / R2	1	42925R	42935R	42950R	1	2
		X1 / X2	1	42925X	42935X	42950X	1	2
		N1 / N2	1	42925N	42935N	42950N	1	2
16	Socket	---	2	43025	43035	43050	---	---
17	Collar (Drive Magnet Assembly)	---	1	43125	43135	43150	---	---
18	Space Ring	---	1	43225	43235	43250	---	---
19	Electric Motor	---	1	Consult Factory with Pump Serial Number			---	---
20	Inlet Flange	---	1	43325	43335	43350	---	---
21	Inlet Flange - Adapter	---	2	43425	43435	43450	---	---
22	Outlet Flange	---	1	43525	43535	43550	---	---
23	Outlet Flange - Adapter	---	2	43625	43635	43650	---	---



Accessories



Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps

Metering Pumps