Lutz-JESCO America Corp.

A measured step forward™

Operations & Maintenance Manual

CENTRAN G2

Total Fluid Management | Metering Transfer Chem Feed

Identification Code																
Pump Data												Motor Data				
Range	Model 50Hz			Model 60Hz			Execution	O-Ring Material	Inside Structure	Connections	rpm	Motor	Voltage/ EEx	Phases	Powers kW	Powers HP
G2	❐ N	❐ P	❐ S	❐ N	❐ P	❐ S	❐ WR GFR-PP	❐ V FPM	❐ R1 C/AI20-3	❐ B BSP threaded	❐ 1450	❐ E IEC	❐ 0 senza motor	❐ 3 phase	❐ 0.55	❐ $^{3}/_{4}$
	06.10			07.11												
	❐ N	❐ P	❐ S	❐ N	❐ P	❐ S	❐ GF CFF-E-CTFE	❐ E EPDM	❐ X1 SiC/AI-203	❐ N NPT threaded	❐ 2900	❐ U NEMA	❐ N V std	❐ 1 phase	❐ 0.75	❐ 1
	10.10			07.14												
	❐ N	❐ P	❐ S	❐ N	❐ P	❐ S	❐ GX CFF-ECTFE	❐ K FFKM	❐ N1 CFF-PT-FE/AI2-03	❐ Z flange 40/32 ISO - ANSI - JIS	❐ CFF-E--CTFE		❐ S V speci-al		❐ 1.1	❐ 1-$^{1}/_{2}$
	10.15			11.15												
	❐ N	❐ P	❐ S		❐ N	❐ P			❐ R2 C/SiC		❐ 3500		❐ E Eex		❐ 1.5	❐ 2
	16.15			11.23												
	❐ N	❐ P	❐ N				outside structure		❐ X2 SiC/SiC	❐ Y flange 40/40 ISO - ANSI - JIS					❐ 2.2	❐ 3
	16.10			17.25												
	❐ N	❐ P	❐ N				❐ integral		❐ N2 CFF-PT-FE/SiC						❐ 3	❐ 5
	02.30			03.35			❐ armoured									
															❐ 4	❐ 5
Year of Manufactuer							Part Number				: ATEX Choose					

Table of Contents

Maintenance
Date of commissioning
Position / system reference
Service

Dealer

Tools

- Adjustable Wrench - 13 mm

Execution Notes

- To facilitate the pump disassembling operations, first disassembly the Hydraulic Parts from the Motor Parts
- unscrew the connections (Pos.1)
- **Warning**! The disassembly operations of parts magnetically connected involve great opposed forces: keep the Motor Parts fixed on floor during the removing of the Hydraulic Parts.

WARNING

The interventions must be performed under supervision of qualified personnel.

Before starting remember:

- cut off the power supply from the motor and disconnect the electrical wiring; pull the wires out from the terminal box and isolate their extremities accordingly
- close the suction and discharge valves; open the drain valve
- use appropriate gloves, protective glosses and acid proof-clothing when disconnecting and washing the pump
- disconnect hydraulic connections: leave enough time for the residual liquid to exit the pump casing and maintenance air to fill the empty volume
- wash the pump before starting maintenance operations
- do not scatter the washing liquid in the environment
- before attempting to dismantle the pump ensure that its motor is disconnected and that it may not 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!** Operations near the magnets attract the tools. Proceed with caution to avoid damages.

For further details see paragraph 9.1 “Disassembling”

Disassembling Steps Sequence

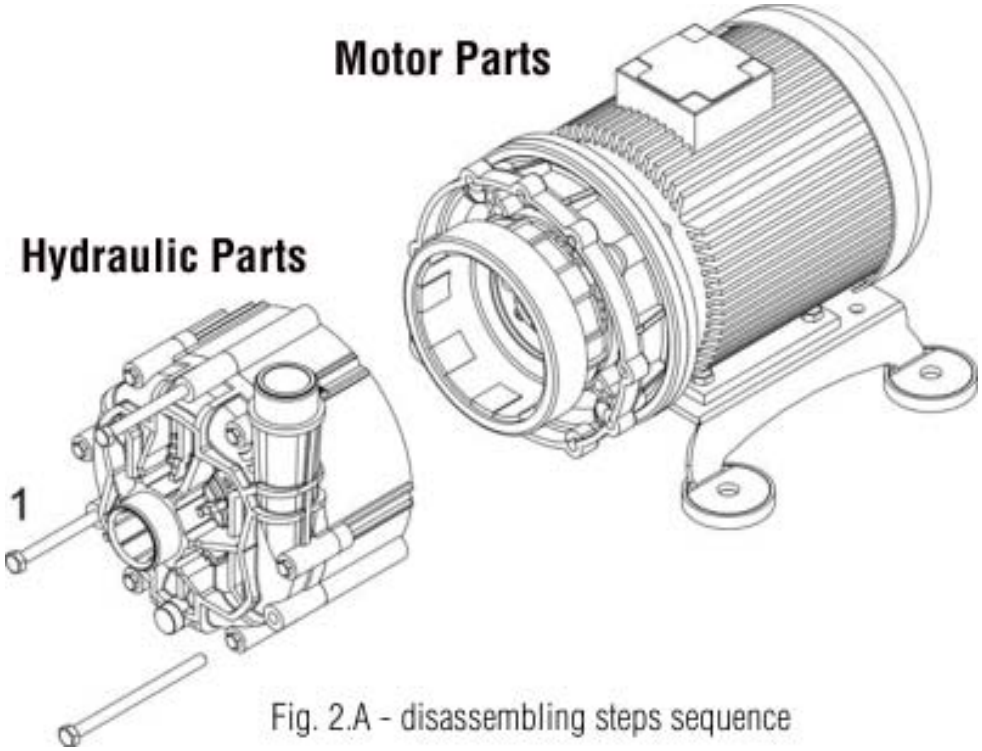


Fig. 2.A - disassembling steps sequence

Ref.	Pos.	Part Name	Qty No	Disassembling Steps Sequence										Spare stock per working years	
				1	2	3	4	5	6	7	8	9	10	2	5
910.1	1	Connection volute casing/strainer	3	■											

Tools

- Adjustable Wrench - 10 mm

Execution Notes

- Disassemble keeping the pump in vertical position (suction on top)
- unscrew the connections (Pos.2)

Ref.	Pos.	Part Name
545	7.1	Guide bushing
222	7.b	Bushing fastener

Fig. 2.1 A - disassembling sequence (hydraulic parts)

Ref.	Pos.	Part Name	Qty No	Disassembling Steps Sequence										Spare stock per working years	
				1	2	3	4	5	6	7	8	9	10	2	5
910.2	2	Connection volute casing/rear casing	6		■										
102	3	Volute caging	1			■									1
331	4	Front thrust bearing	1				■							1	2
233	5	Impeller	1					■						1	1
134	6	Center disc	2					■							
545	7	Guide bushing	2						■					2	4
412	8	Or volute casing	1							■				1	2
162	9	Rear casing	1								■				1
722.1	34	Inlet flange	1	■											
727.1	35	Inlet flange-adaptor	2	■											
722.1	36	Outlet flange	1	■											
727.2	37	Outlet flange-adaptor	2	■											
912	38	Drain plug (optional)	1	■											
195.1	39	Armoured (connection B-N) (optional)	1	■											
922	40	lock nut (optional)	1			■									
195.2	41	Armoured (connection Y-Z) (optional)	1		■										
932	42	Seeger ring (optional)	1			■									
412.1	44	Or drain plug (optional)	1		■										

Tools

- Phillips Screw Driver
- Punch ∅ < 4mm

- Adjustable Wrench - 13 mm

Execution Notes

- unscrew the connections (Pos.10)
- remove the collar from the drive magnet assembly using the punch (see paragraph 9.1)

Fig. 2.2 A - disassembling sequence (motor parts)

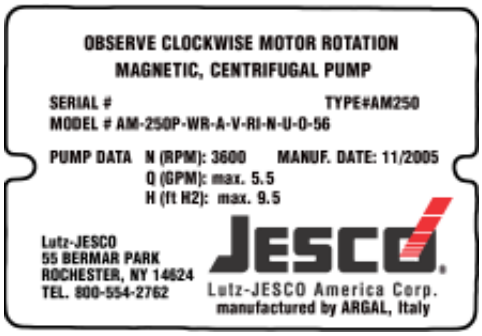
Ref.	Pos.	Part Name	Qty No	Disassembling Steps Sequence										Spare stock per working years	
				1	2	3	4	5	6	7	8	9	10	2	5
910.3	10	Connection drive magnet assembly/electric motor	4			■									
855	11	Drive magnet assembly	1				■								
518	12	Collar (drive magnet assembly)	1					■							1
523	13*	Socket	2					■							2
910.4	14	Connection strainer/electric motor	4						■						
807	15	Bracket	1							■					
910.5	16	Connection electric motor/ baseplate	4								■				
800	17	Electric motor	1									■			
890	18	Baseplate (optional)	1										■		
185	43	Packing ring	4												

* with 4 Kw motor power, the sockets are replaced by a space ring

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 G2 pumps are designed and built for the transfer of liquid chemical products having a specific weight, viscosity, 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 G2 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 G2 pumps are not self priming.

R_1-R_2 execution CENTRAN G2 pumps can run dry.

The liquid to be pumped must be clean for the R_{1-2} execution. The X_{1-2} execution may contain solid (%, dimension and solid part hardness must be agreed during the offer).

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.

Verify the compatibility with the physical-chemical characterisitcs of the liquid.

The specific weight that can be pumped at a temperature of 25°C (both of the ambient and ot the liquid) depends upon the impeller diameter (shown on the identification plate) and the type of construction.

standard construction **N** (stamped on the rating plate) ..... 1.05 kg/dm³
powered construction **P** (stamped on the rating plate) ..... 1.35 kg/dm³
strong-powered construction **S** (stamped on the rating plate) .... 1.80 kg/dm³

The specific weight that can be pumped at 70°C is 10% less than that at 25°C.

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 te choice of materials (specified on the identification plate):

80°C (176°F)	execution WR
110°C (230°F)	execution GF

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

0 - +40°C (14/104°F)	execution WR
-20 - +40°C (-4/104°F)	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).

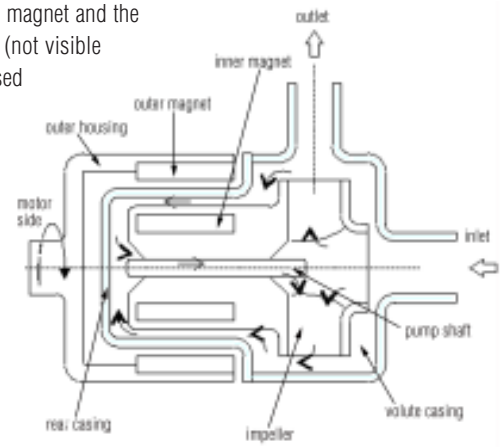
The pump does not include any check valve, any liquid flow control, or motor stop device.

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

Electrical Connections

The electrical connection to the motor terminal determines the direction of rotation of themotor and can be verified by looking at the cooling fan at the rear of the motor (this has to rotate clockwise looking at the motor fan end.)

With single phase motors the direction of rotation may be reversed by changing the wiring according to the motor data plate.

Dry Running Survey

Though the pump can run dry (execution R_1-R_2), 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

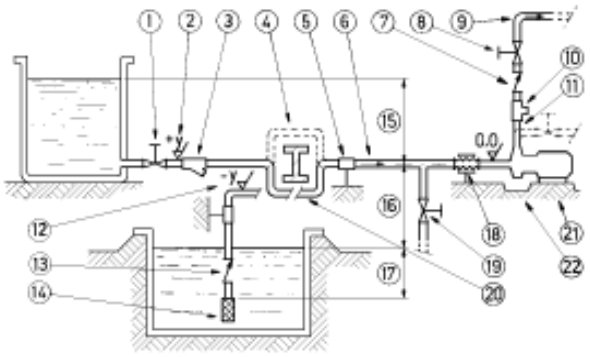
- cover the hydraulic connections
- when lifting the unit do not exert force on the plastic fittings
- lay the pump on its base or mounting plate during transport
- protect the pump by means of adequate shock absorbing supports as bumps and shocks may damage important working parts vital for safety and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

Installation

- check that bolts andnuts are correctly screwed (cfr. 9.3 page 12 “Assembly” for the right bolts torque setting), thermoplastics are dimensionally sensitive to sizeable temperature changes.
- 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
- manually verify that all rotating parts are free to turn without



abnormal friction by turning the motor cooling fan
- 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
- ensure that star-delta starting is implemented for motors whose power is more than 15kW
- 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 unless the motor and its coupling have been adequately pre-arranged
- 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 that mounting elements (screws and bolts) are closed (see bolt torque on page 13)
- 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 feed-back 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 10 mm -13 mm adjustable wrench, scew driver (Phillips drive type), punch ∅ < 4mm. 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.
- as described in paragraph No. 2 “Disassembling sequence”, unscrew the connections (Pos.1) and remove the Hydraulic Parts from the Motor Parts
- proceed seperately to disassemble the Hydraulic Parts or the Motor Parts following the sequence described in paragraph No. 2 ”Disassembling sequence”.
- **Warning**: the disassembly operations of parts magnetically connected involve great opposing forces; keep Motor Parts fixed on the floor while removing Hydraulic Parts
- to facilitate the disassembly operations keep the pump in vertical position (suction on top) Fig. 9.1 B.
- **Warning**: During the disassembly of the hydraulic parts do not bump the guide components.
- **Warning**: After the dismantling of the pump casing extract together the impeller and the central disc; extract avoiding radial movements. Fig. 9.1 C.
- disassemble the MOTOR PARTS: unscrew the 4 Phillips drive screws inside the drive magnet assembly, Pos. E in Fig. 9.1 D.

Fig. 9.1 A - First step of disassembling sequence


Fig. 9.1 B


Fig. 9.1 C

Fig. 9.1 D - Drive magnet disassembly legend

- **Warning**: During the use of screw driver inside the drive mafgnet assembly you must oppose the magnetic attraction
- **Warning**: After unscrewing the 4 screws (Pos. E in Fig. 9.1 D) insert the punch ∅ < 4mm inone of two extraction holes (Pos. D in Fig. 9.1 D) to remove the collar (Pos. C in Fig. 9.1 E) from the back and to allow the removing of the drive magnet assembly, sockets and collar (Pos. A, Pos. B, Pos. C in Fig. 9.1 E) from the motor shaft.

Inspection

Check:

- the pump shaft for cracks and excessive wear
- guide bushing for excessive wear (≅ 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
- for abrasion on the external surface of the rear casing due to rubbing 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 10 mm - 13 mm adjustable wrench, Phillips screw driver
- Bolts have right-hand thread

Bolt torque setting:		M4	M6	M8	M10	M12
(reduce by 25% on plastic parts)	Nm	4	14	24	25	40

- 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
- proceed seperately to disassemble the Hydraulic Parts or the Motor Parts following the reverse sequence described in paragraph No. 2 “Disassembly sequence.”
- _____: assemble the hydraulic parts to the motor parts only after the complete assembly of these two sub-assembly groups.
- assemble the hydraulics and the motor parts, oppose the magnetic force keeping the hydraulic parts by the inlet and outlet connectors
- _____: locate the strainer on the motor flange as shown in Fig. 9.3 A
- the right location of the strainer allows the assembly of the hydraulic parts as shown in Fig. 9.3 B.
- if necessary insert sockets (Pos. B) in the back of the drive magnet assembly (Pos. A) Fig. 9.3 C
- the relative position of drive magnet assembly and sockets is shown in Fig. 9.3 C (a and b planes)
- insert the collar (Pos. C) on the back of the drive magnet assembly keeping the side pump collar surface far as possible from the plane e
- verify that the collar surface with visible brass inserts is motor side
- remove possible traces of grease from motor shaft
- insert the assembled group (drive magnet assembly, sockets, collar) on the motor shaft
- after assembling on motor shaft verify the right position of sockets Pos. B in drive magnet assembly Pos. A (referring to planes a and b shown in Fig. 9.3 C)
- screw the 4 Phillips drive screws repeating the sequence E1, E2, E3, E4 and applying a torque ≅6 Nm

Fig. 9.3 A - Right location of the strainer on the motor flange

Figure 9.3 B - Allowed position of the hydraulic parts

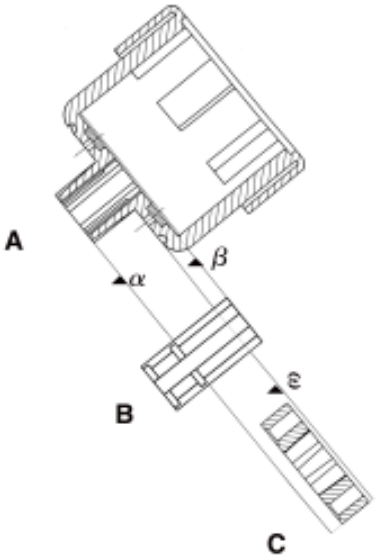


Fig. 9.3 C - Correct alignment of drive assembly, sockets and collar

- at the end of the screwing operation the collar will be at about 3-4 mm from the ε plane shown in Fig. 9.3 C)
- **Warning:** during the Hydraulic Parts assembly keep the parts vertical
- assemble the central disc and impeller before inserting them in the rear casing, Pos. F in Fig. 9.3 E
- **Warning:** There are magnetic attraction forces in action assembling the central disc and impeller: avoid bump opponing manual force
- avoid radial movements while assembling the sub-assembly central disc-impeller in the rear casing
- CENTRAN G2 pumps are provided with a bi-directional axial alignment system (patented system)
- **Warning:** verify that the value of the dimension Q shown in Fig. 9.3 F is 3 mm

Fig. 9.3 D Spin sequence E1 - E2 - E3 - E4

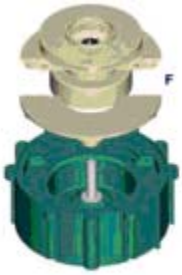


Fig. 9.3 E - Sub-assembly central disc - impeller scheme

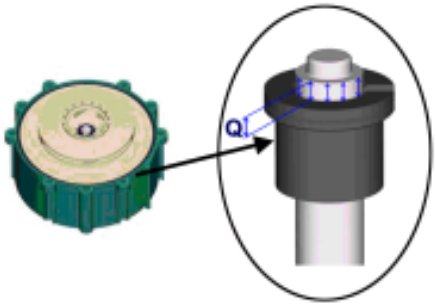


Fig. 9.3 F - Correct alignment sub-assembly impeller - shaft

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. 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 closed at start-up or
- the suction tank being emptied without stopping pump operation

Installation and Commissioning Personnel

Installation 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

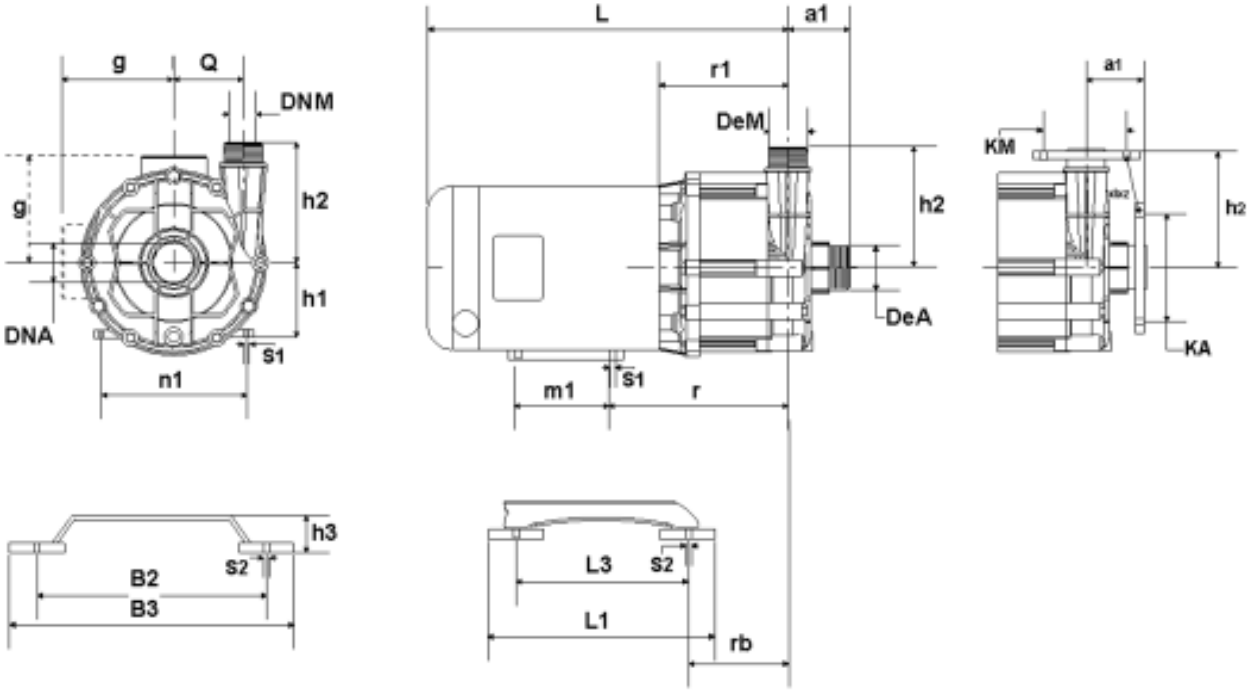
30. liquid excessively abrasive
31. recurring cavitation problems (see 02, 15, 19, 17)
32. high tendency of liquid to crystallize or polymerize when pump is not operating.
33. pump made of materials that are unsuitable for pumped liquid
34. operation with capacity reduced too much

CENTRAN G2 Technical Data - Motor IEC - 60 Hz

CENTRAN G2	07.11			07.14			11.15			11.23		17.25	03.35
IEC Frame	80A	80B	90S	80B	90S	90L	90S	90L	100	90L	100	112	112
a1	67			67			67			67		67	67
L	385		405	385	405	430	405	430	478	430	478	487	487
Q	75			75			75			75		75	75
h1	80		90	80	90		90		100	90	100	112	112
h2	130			130			130			130		130	130
r	199		205	199	205		205		227	205	227	234	234
r1	149			149			149		164	149	164	164	164
rb	161			161			161		176	161	176	176	176
m1	100			100	125		100	125	140	125	140	140	140
n1	125		140	125	140		140		160	140	160	190	190
s1	8			8			8		10	8	10	10	10
g	110		142	110	142		142		155	142	155	168	168
L3	185			185			185		205	185	205	205	205
B2	248			248			248		305	248	305	305	305
S2	14			14			14			14		14	14
L1	245			245			245		259	245	259	259	259
B3	308			308			308		359	308	359	359	359
h3	40			40			40			40		40	40
KM (ISO (*)	100			100			100			100		100	100
KA (ISO)	110			110			110			110		110	110
KM (ANSI) (*)	89			89			89			89		89	89
KA (ANSI)	98			98			98			98		98	98
KM (JIS) (*)	100			100			100			100		100	100
KA (JIS)	105			105			105			105		105	105
d x z (ISO)	18 x 4			18 x 4			18 x 4			18 x 4		18 x 4	18 x 4
d x z (ANSI)	16 x 4			16 x 4			16 x 4			16 x 4		16 x 4	16 x 4
d x z (JIS)	19 x 4			19 x 4			19 x 4			19 x 4		19 x 4	19 x 4

(Dimensions in inches)

(*) for type "Y" connections (see page 1 "Identification Code") KM = KA


g
Q
DNM
g
h2
h1
DNA
S1
n1
L
a1
r1
DeM
h2
DeA
m1
S1
r
a1
KM
h2
KA
h3
B2
B3
S2
L3
S2
L1
rb

CENTRAN G2 Technical Data - Motor NEMA - 60 Hz

CENTRAN G2	07.11		07.14			11.15			11.23		17.25	03.35
NEMA Frame	56	145	143	145	182	145	182	184	182	184	184	184
a1	2-21/32		2-21/32			2-21/32			2-21/32		2-21/32	2-21/32
L	14-15/16	16-15/16	15-15/16	16-15/16	18-1/2	16-15/16	18-1/2	19-1/2	18-1/2	19-1/2	19-1/2	19-1/2
Q	2-15/16		2-15/16			2-15/16			2-15/16		2-15/16	2-15/16
h1	3-1/2		3-1/2		4-1/2	3-1/2	4-1/2		4-1/2		4-1/2	4-1/2
h2	5-1/8		5-1/8			5-1/8			5-1/8		5-1/8	5-1/8
r	8-7/16	8-1/8	8-1/8	9-3/8	8-1/8	9-3/8	9-3/8		9-3/8		9-5/8	9-5/8
r1	5-7/8		5-7/8		6-5/8	5-7/8	6-5/8		6-5/8		6-5/8	6-5/8
rb	6-11/32		6-11/32		7-1/8	6-11/32	7-1/8		7-1/8		7-1/8	7-1/8
m1	3	5	4	5	4-1/2	5	4-1/2	5-1/2	4-1/2	5-1/2	5-1/2	5-1/2
n1	4-7/8	5-1/2	5-1/2		7-1/2	5-1/2	7-1/2		7-1/2		7-1/2	7-1/2
s1	3/8		3/8		13/32	3/8	13/32		13/32		13/32	13/32
g	5-7/16	5-29/32	5-29/32		7-1/32	5-29/32	7-1/32		7-1/32		7-1/32	7-1/32
L3	7-9/32		7-9/32		8-1/16	7-9/32	8-1/16		8-1/16		8-1/16	8-1/16
B2	9-3/4		9-3/4		12	9-3/4	12		12		12	12
S2	1-9/16		1-9/16			1-9/16			1-9/16		1-9/16	1-9/16
L1	9-21/32		9-21/32			9-21/32			9-21/32		9-21/32	9-21/32
B3	12-1/8		12-1/8			12-1/8			12-1/8		12-1/8	12-1/8
h3	1-9/16		1-9/16			1-9/16			1-9/16		1-9/16	1-9/16
KM (ISO (*)	3-15/16		3-15/16			3-15/16			3-15/16		3-15/16	3-15/16
KA (ISO)	4-11/32		4-11/32			4-11/32			4-11/32		4-11/32	4-11/32
KM (ANSI) (*)	3-1/2		3-1/2			3-1/2			3-1/2		3-1/2	3-1/2
KA (ANSI)	3-7/8		3-7/8			3-7/8			3-7/8		3-7/8	3-7/8
KM (JIS) (*)	3-15/16		3-15/16			3-15/16			3-15/16		3-15/16	3-15/16
KA (JIS)	4-1/8		4-1/8			4-1/8			4-1/8		4-1/8	4-1/8
d x z (ISO)	3/4 x 4		3/4 x 4			3/4 x 4			3/4 x 4		3/4 x 4	3/4 x 4
d x z (ANSI)	5/8 x 4		5/8 x 4			5/8 x 4			5/8 x 4		5/8 x 4	5/8 x 4
d x z (JIS)	3/4 x 4		3/4 x 4			3/4 x 4			3/4 x 4		3/4 x 4	3/4 x 4

(Dimensions in inches)

(*) for type "Y" connections (see page 1 "Identification Code") KM = KA

Dimensions in mm; weight and loads in kg

BSP or NPT parallel thread on the hydraulic connections

Contractual Data

Technical Data

Medium _____

conc. % _____ temp °C _____

capacity m3/h _____ head m c.l. _____

w.o. _____

CENTRAN G2		60Hz	07.11						07.14						11.15						11.23						17.25						03.35					
⌀ inlet		BSP-NPT	1-1/2"						1-1/2"						1-1/2"						1-1/2"						1-1/2"						1-1/2"					
⌀ outlet		BSP-NPT	1-1/4"						1-1/4"						1-1/4"						1-1/4"						1-1/4"						1-1/4"					
Flange ISO-ANSI-JIS		DNA*	40 - 1-1/2"						40 - 1-1/2"						40 - 1-1/2"						40 - 1-1/2"						40 - 1-1/2"						40 - 1-1/2"					
		DNM*	32 - 1-1/4"						32 - 1-1/4"						32 - 1-1/4"						32 - 1-1/4"						32 - 1-1/4"						32 - 1-1/4"					
Pump		Model	07.11						07.14						11.15						11.23						17.25						03.35					
		Version	N		P		S		N		P		S		N		P		S		N		P		S		N		P		S		N		P		S	
			WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF	WR	GF
Power (IEC) 60 Hz		KW	0.75		1.1		1.5		1.1		1.5		2.2		1.5		2.2		3		2.2		3		//		4		//		//		4		//		//	
Motor frame		IEC	80A		80B		90S		80B		90S		90L		90S		90L		100L		90L		100L		//		112		//		//		112		//		//	
Power (NEMA) 60 Hz		HP	1		1-1/2		2		1-1/2		2		3		2		3		5		3		5		//		5		//		//		5		//		//	
Motor frame		NEMA	56		56		145		143		145		182		145		182		184		182		184		//		184		//		//		184		//		//	
Pump weight	No motor	Kg	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
	No motor	Lb	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9	6.7	8.9
	IEC 3P	Kg	11	12	13	14	16	17	13	14	16	17	20	21	16	17	20	21	25	26	20	21	25	26	//	//	34	35	//	//	//	//	34	35	//	//	//	//
	IEC E-exd	Kg	23	24	23	24	33	34	23	24	33	34	34	35	33	34	34	35	44	45	34	35	44	45	//	//	54	55	//	//	//	//	54	55	//	//	//	//
	IEC 1-Phase	Kg	14	15	17	18	20	21	17	18	20	21	27	28	20	21	27	28	//	//	27	28	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//
	NEMA 3F	Lb	33	35	35	38	48	50	44	46	48	50	86	88	48	50	86	88	91	94	86	88	91	94	//	//	91	94	//	//	//	//	91	94	//	//	//	//
	NEMA E-exd	Lb	33	35	35	38	48	50	44	46	48	50	86	88	48	50	86	88	91	94	86	88	91	94	//	//	91	94	//	//	//	//	91	94	//	//	//	//
	NEMA 1P	Lb	37	39	42	44	73	76	66	69	73	76	106	109	73	76	106	109	//	//	109	109	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//	//
noise		dB	70						70						70						70						74						74					
Max. Head		m	15.5						16.5						22						28						36						35					
Max. Capacity		m3/h	15						19.5						24						27						30						10					
Max. NPSH req.		mc.l																																				
phase		N.	3-phase - 1-phase (<3kW)																																			
voltage Std. IEC		V	400 +/- 5% 50 Hz																																			
voltage Std. NEMA		V	460 +/- 5% 60 Hz																																			
protection		IP	55																																			
Loads (ports-section)		Kg	Max. single strength value F(x,y,z) = 2.5																																			
Dynamic loads (base)		Kg	6.5																		11																	

* for "Y" type connections (see page 1 "Identification Code") DnM - DnA

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Lutz-JESCO America Corp.

Code Number Configuration

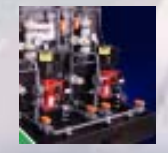
TMR	07.11 P	WR	V	R1					
Route Series	Chosen model	EXEC. N=normal P=powered S=strong-pow.	see materials & construction	V=FKM E=EPDM K-FFKM	see materials & construction	B=thr. BSP N=thr. NPT Z=flanged Y=flanged 40/40 ANSI	U=NEMA	N=Std. S=Spec. V E=Ex-proof O=No motor	3=3 phase 1=1 phase
Series	**Model**	**Execution**	**Version**	**O-ring Material**	**Internal Structure**	**Connection**	**Standard Motor**	**Data Motor**	**Motor Phases**
TMR	07.11 07.14 11.15 11.23 17.25 03.35	N P S	WR GF GX	V E K	N1 R1 X1 N1 R1 X1				

Parts List

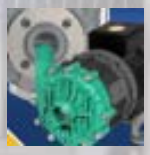
Item No.	Description	Code	Qty.	Part Number						Spare Stock	
				Model 07.11	Model 07.14	Model 11.15	Model 11.23	Model 17.25	Model 03.35	2 yrs	5 yrs
1	Connection for Volute	-	3	41111	41114	41115	41123	41117	41103	---	---
2	Casing Screw	-	6	41211	41214	41215	41223	41217	41203	---	---
3	Volute Casing *(See Version)*	WR	1	41311WR	41314WR	41315WR	41323WR	41317WR	41303WR	---	1
		GF	1	41311GF	41314GF	41315GF	41323GF	41317GF	41303GF	---	1
4	Front Thrust Bearing *(See Version)*	WR	1	41011WR	41014WR	41015WR	41023WR	41017WR	41003WR	1	2
		GF	1	41011GF	41014GF	41015GF	41023GF	41017GF	41003GF	1	2
5	Impeller *(See Version)*	WR	1	41411WR	41414WR	41415WR	41423WR	41417WR	41403WR	1	1
		GF	1	41411GF	41414GF	41415GF	41423GF	41417GF	41403GF	1	1
6	Center Disc	-	2	41511	41514	41515	41523	41517	41503	---	---
7	Guide Bushing *(See Internal Structure)*	R1/R2	1	42911R	42914R	42915R	42923R	42917R	42903R	1	2
		X1/X2	1	42911X	42914X	42915X	42923X	42917X	42903X	1	2
		N1/N2	1	42911N	42914N	42915N	42923N	42917N	42903N	1	2
8	O-Ring *(See O-Ring Material)*	V	1	41711V	41714V	41715V	41723V	41717V	41703V	1	2
		E	1	41711E	41714E	41715E	41723E	41717E	41703E	1	2
		K	1	41711K	41714K	41715K	41723K	41717K	41703K	1	2
9	Rear Casing *(See Version)*	WR	1	42711WR	42714WR	42715WR	42723WR	42717WR	42703WR	---	1
		GF	1	42711GF	42714GF	42715GF	42723GF	42717GF	42703GF	---	1
10	Screw *(Magnet-Assembly)*	-	4	42011	42014	42015	42023	42017	42003	---	---
11	Drive Magnet Assembly	-	1	41911	41914	41915	41923	41917	41903	---	---
12	Collar *(Magnet-Assembly)*	-	4	42011	42014	42015	42023	42017	42003	---	1
13	Socket	-	2	43011	43014	43015	43023	43017	43003	---	2
14	Screw *(Strainer/Motor)*	-	4	42111	42114	42115	42123	42117	42103	---	---
15	Bracket	-	1	42211	42214	42215	42223	42217	42203	---	---
16	Screw *(Motor/Baseplate)*	-	4	42311	42314	42315	42323	42317	42303	---	---
17	Electric Motor	-	1	*Consult Factory with Pump Serial Number*						---	---
18	Baseplate *(Optional)*	-	1	42411	42414	42415	42423	42414	42403	---	---
43	Packing Ring	-	4	42511	42514	42515	42523	42514	42503	---	---

Accessories

Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps

Metering Pumps

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