DRAINAGE PUMPS
Type RLV

Owner's manual

Pompe-drainage-RLV-mpvnotice.indd/mars15

Identification

Each pump has his code engraved on the nameplate.

CE	Type		
	Serial		
V		Pn-kW	
A	Q		l/1'
O IP	H		mO
µf			RPM
Hz	kg	Year	
fabriquant			

Type	Code
Serial	Serial
V	nominal voltage
Pn-kW	Power
A	Note
Q	Max flow
IP	IEC Protection
H	Max head
µf	Capacitor
RPM	Motor speed
Hz	Frequency
Kg	Weight
Year	Year of construction

Standard

2011/65/EU
EMC 2004/108/CE

Characteristics of pumped liquid

- PH : between 6 and 9
- Velocity no less than 1m/s, same vicosity as water
- temperatur max. 35°C (95°F)
- Max content of solids in suspension : 0,5%
- Ø max of solids in suspension : 6 mm (RLV-S) 10 mm RLV-M, RLV-L)

Solids ins suspension must not be neither too abrasive or agglomerating.

Use limites

For all electric pumps respect following limits :

- Max. immersion depth : 20 m
- Running position : only vertical
- Max. time of running at delivery 0 (closed gate-valve) 2 - 3 min
- Max. starting per hour (equally distribued in the time) : 30
- Motor electric supply voltage : ± 10 % of the plate value at 230 -400V

Safety precaution

IMPORTANT : Pay attention to the following contra-indications:

- In areas with explosion risk, use electric submersible pumps equipped with explosion-proof motor only in accordance with working conditions. (In compliance with local safety regulations and standards) Don't use the electric pump for liquids intended to human nourishment.

- For filling or emptying swimming or garden pools in presence of persons it is necessary to use exclusively low tension pumps series FLIP BT installed in compliance with local safety regulations and standards. Never touch by hand the electric pump when running.
- Never use the electric pump when not immerged. The dry running, even if for a short time, could cause the immediate breakage of all hydraulic and mechanic components.

- During running the water level must cover totally the electric pump.
- Verify that the elctric pump and relevant equipment comply with local safety regulations and standards.

Confomity and warranty foreseen by the general sale conditions will be no longer valid in case of modifications made on the electric pump without the written acceptance of the manufacturer who will be not responsible of any damage to persons, animals or things.

Handling and storage

HANDLING

- To reduce risks during lifting and handling operations, be sure that all equipment are complying with safety rules and suitable for the weight, dimensions and shape of the electric pump.
- Weight and dimensions of the electric pumps are indicated on table at following pages.

Never use the lead-out cable for handling or lifting the electric pump, but use the proper handle.

- During handling keep electric cables rolled up (bending radius 10 times greater than the cable diameter. Be sure that cable free ends are not inadvertitely immerged or, in any case, wetted.
Safeguard your hands during this operation.

STORAGE

-Electric pumps must be stored in covered, dry and well aerated rooms.
Keep the electric pump in vertical position checking its stability in order to avoid dangerous falls. Be sure that electric pump and cables are not exposed to sunlight for long time.
Electric pump must be througly cleaned after a running period and it is necessary to verify the condition of different component.
For cleaning don't use detergents containing solvents or other hydrocarbon based products.

Installation

Pools, tanks or pits fitted for the electric pump and positioning of the same in respect of drainage system level are regulated by directives that must be respected.

CONTRÔLES AVANT INSTALLATION

PRELIMINARY INSPECTIONS

Before installation proceed as follows:

- Check that implements and equipment used for handling, lifting and positioning are well dimensioned and comply with local safety regulations.
- Check that pit, pool or tank are well dimensioned and that water level assures a correct running of electric pump with limited startings per hour.
- Check, furthermore, that solids in suspension or other foreign materials able to clog the electric pump are not present, install a grid when necessary.
- Check that the electric network power is higher than the power absorbed by the electric pump.
- Verify frequency, voltage, length of electric cables keeping in mind that the motor voltage should respect limits indicated at par. 3.2.
- Verify the efficiency of all components (pannel, electrodes etc.).
- Electric pumps equipped with oil chamber between mechanical seals are already filled with the correct quantity of oil.
- Verify the correct quantity of oil after transport, after a long period of inactivity, after storage in hot hambients or whenever a lack of oil is presumed.

PUMP POSITIONING

Ckeck that pit or tank are well dimensioned and that water level assures a correct running of the electric pump with limited startings per hour.

Check, furthermore, that the pit is equipped with suitable devices to prevent that liquid dropping in the same could cause any possible turbolence and air pockets in the pump suction.

The assessment of the risk of electric shock is issued by the installer.

When positioning Atex pumps not equipped with an automatic level switch, it is up to the installer to ensure that the pump always remains completely immersed in the liquid.

All operations of installation must be carried out with the electric pump disconnected from general electric network.

Delivery pipe must have diameter not inferior to the pump inlet. When using a flexible pipe , it is advisable a reinforced pipe with metallic spiral which maintains the section unchanged even in presence of bends.

The eventual foot valve and gate valve must be assembled at a distance of approx 50 to 200 cm. in a section of metallic pipe (rigid).

Special attention should be paid to the positioning of electric cables in order to avoid possible bending, pressing, lifting and that the same are accidentaly sucked by the pump.

When the pump is installed on the bottom of the pit relevant rope or chain must be anchored to one side of the upper part of pit; when the pump is suspended the rope or chain must guarantee the perfect support of the electric pump together with relevant delivery pipe considering also the dynamic reactions when starting and functioning.

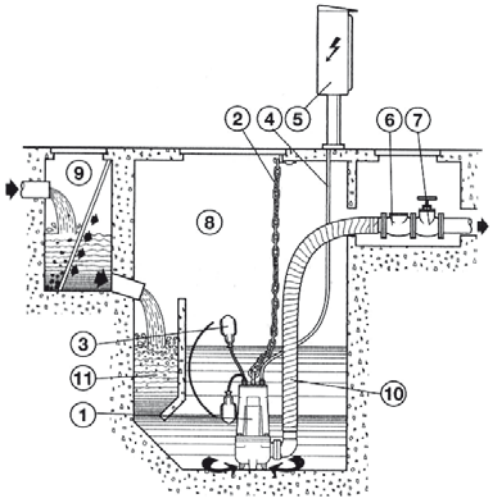


Fig. 2

ELECTRIC CONNECTIONS

Electric connections must be carried out perfectly by competent personnel complying with local safety regulations.

Before making connections be sure that electric power is disconnected and that it cannot be reconnected accidentally. Earth cable must be connected before network cables; in case of motor dismantling earth cables must be disconnected at last.

Earthing shall be carried out in compliance with safety regulations and under the installer's responsibility.

The electric control panel and relevant electric equipment must comply with safety regulstions and rules. Instruments and components of the panel must be suitable to guarantee a reliable and lasting service. The use of less quality or undersized equipment could cause heavy damages to the motor or / and installation.

Starting equipment, when necessary, must be in compliance with regulations and rules in force.

The electric control panel, manufactured according to the conditions of the place of installation, must be protected against direct sunlight, located in a ventilated place without humidity and with an ambient temperature complying with the manufacturer indications.

Should the electric pump be installed in ambients with possible presence of persons, it's necessary to install a differential switch with residual current (DN) = 30 mA.

SINGLE PHASE ELECTRIC PUMPS

Pumps are available with or without automatic floating switch. The condenser is included inside the motor. Protection is care of the end user.

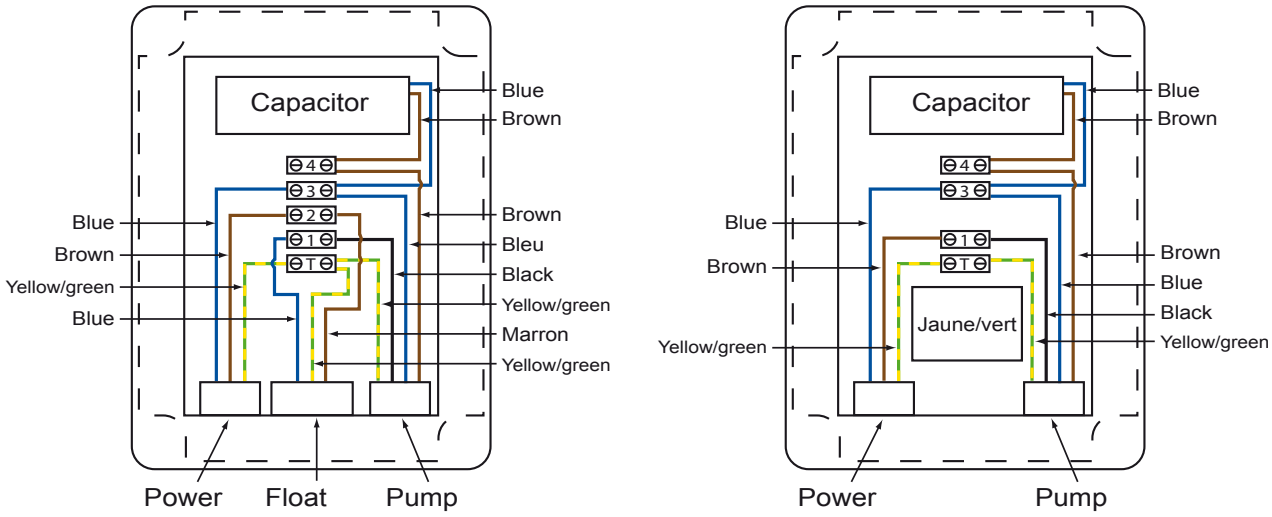


Fig 5. Wiring diagrams for a single-phase pump with and without float

THREE-PHASE ELECTRIC PUMPS

Protection carried out by end user through a control panel in compliance with characteristics reported at following paragraph and able to assure a reliable lasting running.

RLV pumps are equipped with thermal and control panel in compliance with automatic restarting protecting winding against sudden and temporary overheating.

Starting equipment, when necessary, must be in compliance with regulations and rules in force.

The following protection devices by care of installer assure more safety both for the users and for the electric pump :

- Main switch with suitable sized fuses
- Contactor with thermal realy properly dimensioned to motor power Low level device against dry running by floating switch or electrodes Minimum voltage relay against phase failure (optional)
- Ammeter, Voltmeter and frequency-meter (optional)
- Electric connection scheme for three-phase electric pumps, fig. 7-8.

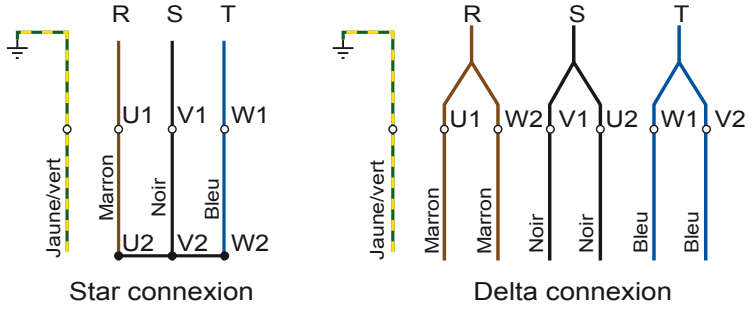


Fig 7. Scheme for direct starting

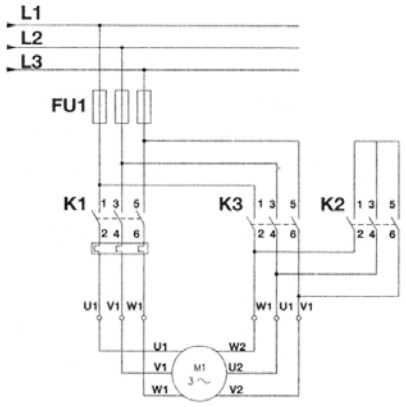


Fig 8. Connection scheme for star-delta starting

ELECTRIC CABLE

In case it should be necessary to extend the length of the electric cable verify the good quality and the correct section in relation with the length and the motor power.
The connection must be executed by care of skilled personnel and with materials that guarantee a perfect insulation of conductors, tightness and impermeableness lasting in time.
The eventual replacement of electric cable must be carried out by skilled personnel using electric cable H07RN-F. The cable is suitable for connection type M according to normatives EN-i 60335-1 (CEI 61-50).

CHECKING THE ROTATION DIRECTION (THREE-PHASE ELECTRIC PUMP)

The single phase electric pump rotates always in the correct direction. In case of wrong rotation direction stop immediately the electric pump and inform the distributor.
Check the exact rotation direction of three-phase electric pumps proceeding as follows :

- Slightly tilt the pump to one side or hang it from a lifting means;
- Start the electric pump for a few seconds, making sure that the kickback does not become a danger hazard;
- The correct direction is indicated by arrows on the electric pump cover and pump body. If the kick-back has been anticlockwise viewing the electric pump from above, then the rotation direction is correct - (fig 9)

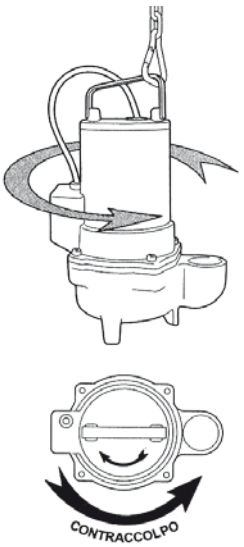


Fig. 9

If the rotation direction is wrong, disconnect the power supply and reconnect the electric pump to the main by switching two of the three phases with each other.
The rotation direction must be checked again every time the electric pump is electrically disconnected or an intervention is necessary in case of phase failure.

Attention ! The running on wrong rotation direction causes an overload to the motor and heavy damages to the electric pump.

Starting and running

STARTING

Before starting the electric pump check again electric and hydraulic connections and relevant rating. Check that all safety procedures and their good functioning have been activated.

Check that electric pump is correctly immerged and that the liquid level is allowing the correct starting.
Start the electric pump and check that value of current does not exceed plate value and that the supply tension is on the foreseen limits.

Adjust, when present, the correct rating of the protection relay according to the working current value: the relay must be rated 10% more than the electric pump plate value.
If the unit is not starting don't insist. Identify the malfunction and repair the causes (see par. Defect of functioning).

RUNNING

- Standard utilisation conditions assure a long life to the electric pump.
- During running it is however necessary to periodically check the working conditions especially when solid or thready substances are present in the pumped liquid.
- Be sure that number of startings per hour does not exceed the limits indicated and that same are equally distributed in time.
- Frequent startings in a short time cause overheating and damages to electric winding.
- During inactivity of electric pump plan regular checks on motor insulation and, when present, on the electric panel.
-

When electric pump is pumping solid or thready substances that could make deposits it's necessary to provide frequent washings with clean water. Check, furthermore, that suction grid, pit and eventual floating switch are always cleaned.

Maintenance

ROUTINE MAINTENANCE

Routine maintenance limited to regular general checks, cleaning or replacement of few component parts must be carried out by expert technicians only by suitable tools respecting the norm of safety of working ambient and after becoming familiar with content of the present manual or any other documentation supplied with the electric pump.

Before any checking or maintenance proceed as follows :

- Disconnect the electric power supply being sure that same cannot be reconnected inadvertently.
- Check that implements and equipment used for handling, lifting and positioning are well dimensioned and comply with local safety regulations.
- Proceed on safety conditions when there is the risk of toxic gas in the accumulation tank. Make sure of an efficient ventilation and to be assisted by a second worker outside able to act promptly and in safety, when necessary.

Regular checks on all hydraulic and mechanic components are necessary and for electric pumps equipped with oil chamber for the mechanical seals it is necessary to check conditions and level of oil.
The frequency of controls depends on conditions of use of the electric pump.
Inspection frequency is necessary for a minimum of 4000 to a maximum of 8000 service hours and at least every year.

Check that insulation resistance of electric pump is less than 5MW in air and less than 2MW in water with testing current of 500V. in C.C.

Bearings: their safe working life has been estimated at 10000 hours of use, after which they must be replaced. Check the state of the bearings every 5000 hours or every year of work. If any noise occurs or if the shaft presents radial play, apply to the authorised distributor.

EXTRA MAINTENANCE

Use genuine spare parts only for repairs. Order necessary spare parts following drawings and specify the following information when ordering :
1. The type of electric pump
1. Serial number and manufacturing year
2. Denomination and reference number of the spare parts
3. Required number of parts.

Extra maintenance and repairs must be carried out only by authorized specialized workshops. The manufacturer declines any responsibility for eventual damages to persons, animals or things for maintenance and repair interventions carried out by non authorized personnel or with no genuine spare parts.

On pain of expiry of the certification, it is forbidden to have any work done on Atex pumps by personnel not authorised.

Warrantly

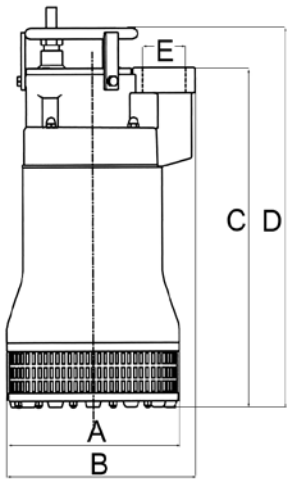
Warranty of the product is subject to general sale conditions.
Warranty is recognized when all mechanical, hydraulic, electric norms and correct use indicated on the present manual are respected.

Off service and demolition

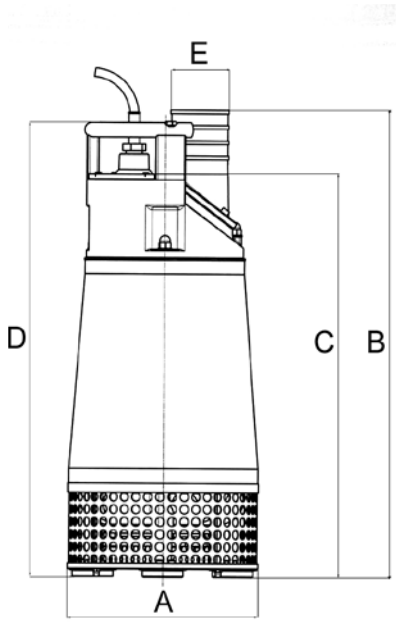
In case of off service and demolition, follow scrupolously the local antipollution norms.
Proceed to the differentiated disposals according to the following list of materials composing the electric pumps in standard version:

impellers:	cast-iron, bronze or stainless steel / plastic material (PPOM) / Nylon
pump bodies, covers, motor covers:	cast-iron, bronze or stainless steel / aluminium
stator – rotor – shaft:	steel / stainless steel / magnetic iron / copper
electric cables – winding:	copper / rubber sheathed
liquid between the mechanical seals:	mineral oil

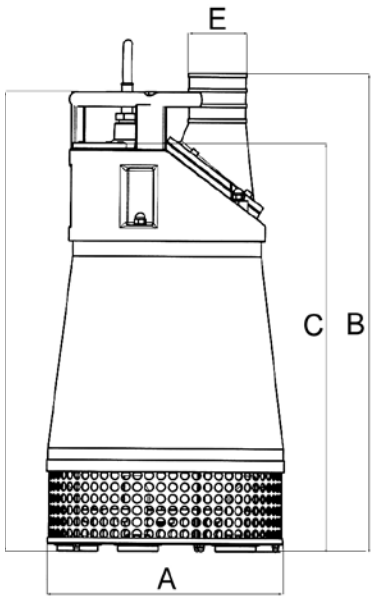
Dimensions and weights



RLV S



RLV M



RLV L

TYPE	A	B	C	D	Ø E	Kg
RLV-S 11	250	270	480	530	2''1/2	34
RLV-S 15	250	270	480	530	2''1/2	36
RLV-S 22	250	270	480	530	2''1/2	37
RLV-M 55 APT	326	794	685	775	3''	96
RLV-M 55 MPT	326	794	685	775	4''	96
RLV-L 110 APT	404	818	697	786	4''	165
RLV-L 110 MPT	404	818	697	786	6''	165

Troubleshooting

DEFAUT	CAUSE PROBABLE	REMEDE
Failure in electric pump	1. Lack of current to the motor. 2. Insufficient voltage. 3. Thermal protection activated. a) single-phase motor b) three-phase motor 4. Defective non operating floating switch. 5. No signal from electrodes for level control. 6. Single-phase motor: defective Condenser. 7. Motor failure. 8. One phase interruption (three-phase motors). 9. Clogged impeller.	1. Check electric network, supply cables, connections and fuses. 2. Verify value (see par. 3.4 :Use limits). 3. a) Wait for motor cooling (see par. «electric connections»). b) Reset thermal relay and check ratio starting. 4. Clean and check efficiency; (contact the Assistance service if necessary). 5. Wait for level reset, check efficiency of level control relay and relevant electrodes. 6. Check and eventually replace condenser. 7. Contact the Assistance Service. 8. Reset connections. 9. Remove obstruction, wash and clean (contact the Assistance Service if necessary).
Electric pump starting with thermal protection intervention winding.	10. Voltage different from plate. 11. Three-phase motor: phase interruption. 12. Three-phase motor: Low rating. 13. Short-circuit, earth leakage in electric cables or motor. 14. Too high temperature of pumped liquid. 15. Pumped liquid too dense. 16. Dry running of the electric. 17. Defective thermal relay.	10. Check the power supply voltage value. 11. Reset connections. 12. Adjust rating of relay value. 13. Individuate interruption and repair (contact the Assistance Service if necessary). 14. Check whether the right type of pump has been selected, 15. Dilute liquid. Check whether the right type of pump has been selected. 16. Verify liquid level and level pump. 17. Replace it.
Electric pump drawing more power than value of plate	18. Overload due to pump clogged. 19. Pumped liquid too dense or viscious. 20. Overload due to obstruction. 21. Damaged motor bearings. 22. Wrong rotation direction. 23. Insufficient pressure required	18. Remove obstruction and clean (contact Assistance ervice if necessary). 19. Dilute liquid. Check whether the right pump has been selected. 20. Remove obstruction and clean of extraneous bodies. 21. Replace. Contact the Assistance Service. 22. Invert two of the three phases. 23. Increase electric pump pressureby the installation. reducing flow. Check whether the right pump has been selected.
Insufficient performance	24. Suction, impeller, valve ordelivery pipeline clogged. 25. Bleared pump or impeller. 26. Air or gas in the pumped liquid.	25 Replace or repair. 26. Increase dimensions of pit or collecting tank and foresee degasing devices.

Capacity curves