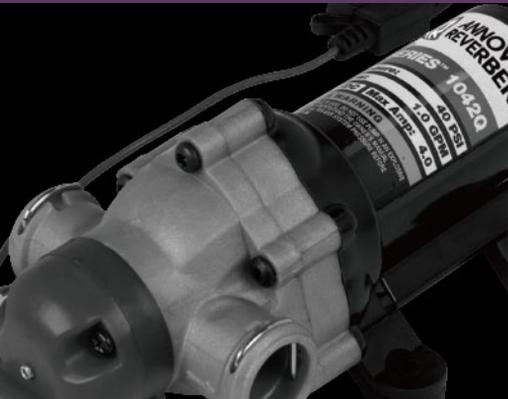




Est. 1958
MODENA, ITALY



INSTRUCTION MANUAL
MANUALE ISTRUZIONI
产品使用手册



Technical and Performance Data - 技术参数

Model 型号	Max. flow 最大流量		Max. pressure 最大压力		Weight 重量	
	l/min	gpm	bar	psi	kg	lb
-						
AR 3.8 DFL	3.8	1	2.7	40	0.9	2
AR 5.3 DFL	5.7	1.5	6.9	100	2.2	4.8
AR 5.7 DFL	5.7	1.5	4.8	70	2.2	4.8
AR 8.3 DFL	8.3	2.2	4.8	70	2.2	4.8
AR 11.4 DFL	11.4	3	4.1	60	2.5	5.6
AR 15.1 DFL	15.1	4	4.1	60	2.5	5.6
AR 20.8 DFL	20.8	5.5	4.1	60	2.5	5.6
AR 26.5 DFL	26.5	7	4.1	60	4.3	9.5
AR 13.8 DFL	7.6	2	13.8	200	5.9	13



AR 26.5 DFL



AR 13.8 PFL



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AR 3.8 DFL

FIG.1

EN



AR 5.3 DFL

FIG.2



AR 8.3 DFL

FIG.3



AR 11.4 DFL

FIG.4



AR 15.1 DFL

FIG.5

EN



AR 20.8 DFL

FIG.6



AR 26.5 DFL

FIG.4



AR 13.8 PFL

FIG.5



GENERAL INFORMATION - PART ONE

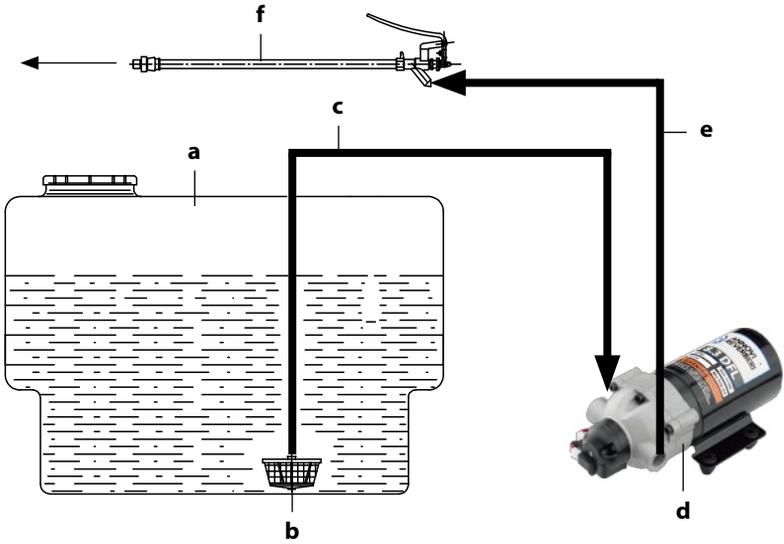


FIG.6

EN

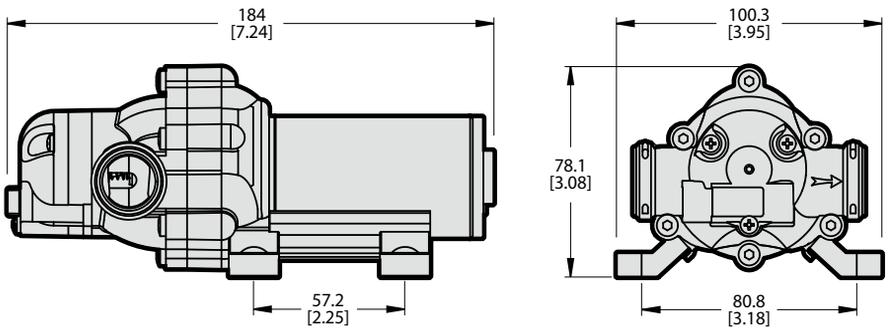
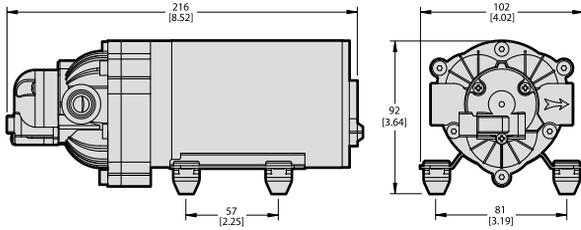


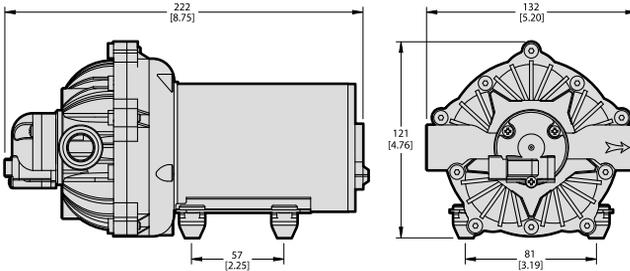
FIG.7

AR 3.8 DFL

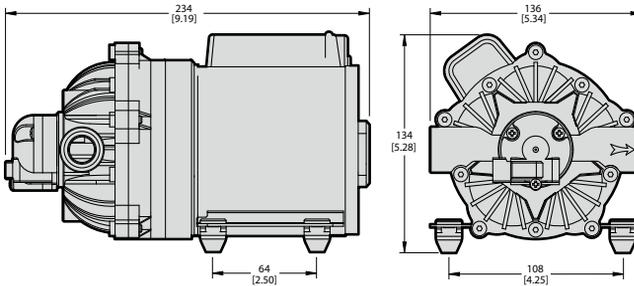
GENERAL INFORMATION - PART ONE



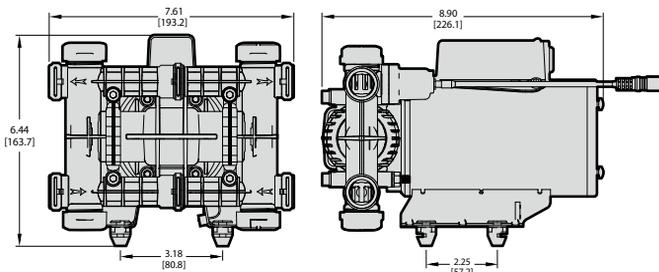
AR 5.3 DFL - 8.3 DFL



AR 11.4 DFL - AR 15.1 DFL - AR 20.8 DFL



AR 26.5 DFL



AR 13.8 PFL

FIG.8

EN



Foreword

This manual consists of two distinct parts.

The first is intended for both the end user and the Skilled Technician and contains the motor pump operation and maintenance instructions; the second is dedicated to the Skilled Technician only and provides instructions for the correct integration of the motor pump in the end machine.

By **Skilled Technician** is meant:

- the Manufacturer of the machine (e.g., garden trolley for phytosanitary treatments) in which the motor pump is integrated;
- a person, normally belonging to the after-sales centre, specifically trained and authorised to perform special maintenance jobs and repairs on the motor pump and on the machine in which this is integrated.

It should be remembered that jobs on the electrical parts must be performed by a Skilled Technician who is also a Qualified Electrician, meaning a person professionally qualified and trained to check, install and repair electrical apparatus in a "workmanlike" manner and in accordance with the laws applicable in the country where the motor pump and the machine integrating it are installed.

PART ONE

General information

Carefully read this manual and the manual of the machine in which the motor pump is integrated: **always carefully comply with the instructions contained in them.**

Special care must be given to reading the parts of the text marked by the symbol:



Warning

inasmuch as these contain important safety instructions concerning motor pump operation.

The Manufacturer disclaims all liability relating to damage caused by:

- failure to abide by the contents of this manual and the manual of the machine in which the motor pump is integrated;
 - the motor pump being used in ways other than those indicated in the "Intended use" paragraph;
 - the motor pump being used in ways contrary to applicable laws on safety and prevention of work accidents;
 - tampering with the safety devices and with max operating pressure limitation;
 - incorrect assembly and installation;
 - incorrect maintenance;
 - changes made or jobs done on the pump without the permission of the Manufacturer;
 - use of non-original spare parts or which are not suitable for the motor pump model;
 - repairs not performed by a **Skilled Technician**.
-

Using and looking after the manual



Warning

This manual completes that of the machine in which the motor pump is integrated: read all the manuals carefully.

The manual must be deemed an integral part of the motor pump and must be looked after for future reference and kept in a protected place where it can easily be referred to in case of need.

The manual contains safety precautions for the operator and those surrounding him/her and for the protection



of the environment.

In case of deterioration or loss, a new copy must be requested from the Manufacturer or from a **Skilled Technician**.

In the event of the machine in which the motor pump is integrated being transferred to another user, please also include this manual.

The Manufacturer reserves the right to make all the amendments required to update and correct this publication without prior notice.

Symbols

The symbol:



Warning

marking certain parts of the text indicates a likely chance of injury to persons unless the relative prescriptions and indications are followed.

The symbol:

CAUTION

marking certain parts of the text indicates the possibility of damaging the motor pump unless the relative instructions are followed.

Identifies useful and important information or procedures which should be borne in mind.

Pump and manufacturer identification

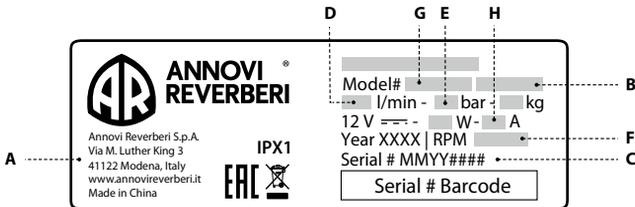
Data plate

The data plate shown here, containing essential information for safe operation, is affixed to every pump.

- A) Manufacturer's name and address
- B) Model
- C) Serial number
- D) Maximum delivery rate (l/min)
- E) Maximum operating pressure (bar)
- F) Maximum rpm
- G) Pump code
- H) Maximum current absorption (A)

Manufacturer's name and address

Annovi Reverberi Spa
Via Martin Luther King, 3
41122 Modena (MO) - Italy





GENERAL INFORMATION - PART ONE

EUROPEAN DECLARATION OF INCORPORATION

Annovi Reverberi S.p.A.

Via Martin Luther King, 3 - 41122 - Modena - Italy

We, Annovi Reverberi S.P.A., declare under our sole responsibility that the partly completed machinery:

Description: Diaphragm Pumps

Year of construction: XXXX

Serial number: ##MY####

With S/N starting XXXMY0001. **XX** is the two-digit pump code. **M** is the month, (Jan=1, Feb=2, Mar=3...Oct=A, Nov=B, Dec=C).
Y is the year, (2015=5, 2016=6, 2017=7...2020=A, 2021=B...) and **0001** is a consecutive number.

Brand: Annovi Reverberi

Model: AR 3.8 DFL, AR 5.3 DFL, AR 8.3 DFL, AR 11.4 DFL, AR 15.1 DFL, AR 20.8 DFL, AR 26.5 DFL, AR 13.8 PFL

Fulfills the following Essential Health and Safety Requirements in accordance with Annex I of Directive 2006/42/EC:

1.1.2-1.1.3-1.1.5-1.3.2-1.3.4-1.3.7-1.3.8-1.3.8.1-1.3.8.2-1.4.1-1.5.1-1.5.4-1.5.5-1.5.6-1.5.8-1.5.10-1.5.11-1.5.13-1.6.1
1.6.2-1.7.1-1.7.1.1-1.7.2-1.7.4-1.7.4.1-1.7.4.2

The partly completed machinery is also in conformity with the following European Community directives:

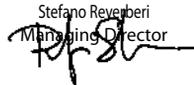
DIRECTIVE 2006/42/EC - DIRECTIVE 2014/30/EU - DIRECTIVE 2011/65/EU

And the following standard(s) and other normative document(s):

EN 60335-1:2012+A11:2014 - EN ISO 12100: 2010 - EN ISO 14982:2009

We declare that the relevant technical documentation has been compiled in accordance with part B of Annex VII of Directive 2006/42/EC and we undertake to send relevant information on the partly completed machinery by post or electronically, in response to a request by the national authorities. The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive and subsequent modifications, where appropriate.

Modena, Italy
April 10, 2018

Stefano Reverberi
Managing Director




Specifications and technical data

The motor-driven pump unit consists of a diaphragm pump, in-unit with a permanent magnet electric motor running on 12 VDC.

Pumps are self-priming and do not require the use of lubricants, except for AR13.8 PFL.

All pumps can run dry, except for AR13.8 series that needs always water.

		AR 3.8 DFL	AR 5.3 DFL	AR 8.3 DFL	AR 11.4 DFL
POWER CONNECTION					
Mains power 12 V		12 V			
Max. input power	(W)	48	96	96	120
Max. input	(A)	4	8	8	10
Protection fuse	(A)	5	15	15	15
HYDRAULIC CONNECTION					
Max. water supply temperature	(°C - °F)	60 - 140			
Min. water supply temperature	(°C - °F)	5 - 41			
Max. priming depth	(m - ft)	2.5 - 8.0			
PERFORMANCE					
Max. flow rate	(l/min USgpm)	3.8 - 1.0	5.7 - 1.5	8.3 - 2.2	11.4 - 3.0
Flow rate at max. pressure	(l/min USgpm)	2.9 - 0.8	3.8 - 1.0	5.1 - 1.4	7.0 - 1.9
Max. pressure	(bar psi)	2.7 - 40	6.9 - 100	4.8 - 70	4.1 - 59
WEIGHT	(kg - lb)	0.9 - 2.0	2.2 - 4.8	2.2 - 4.8	2.5 - 5.6



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		AR 15.1 DFL	AR 20.8 DFL	AR 26.5 DFL	AR 13.8 PFL
POWER CONNECTION					
Mains power 12 V		12 V $\overline{=}$			
Max. input power	(W)	156	204	276	240
Max. input	(A)	13	17	23	20
Protection fuse	(A)	15	20	25	25
HYDRAULIC CONNECTION					
Max. water supply temperature	(°C - °F)	60 - 140			
Min. water supply temperature	(°C - °F)	5 - 41			
Max. priming depth	(m - ft)	2.5 - 8.0	2.5 - 8.0	3.0 - 9.0	1.8 - 5.9
PERFORMANCE					
Max. flow rate	(l/min USgpm)	15.1 - 4.0	20.8 - 5.5	26.5 - 7.0	7.6 - 2.0
Flow rate at max. pressure	(l/min USgpm)	10.5 - 2.8	15.2 - 4.0	19.7 - 5.2	4.9 - 1.3
Max. pressure	(bar psi)	4.1 - 60			13.8 - 200
WEIGHT	(kg - lb)	2.5 - 5.6	2.5 - 5.6	4.3 - 9.5	5.9 - 13

EN

Specifications and details are approximate.

The Manufacturer reserves the right to make all changes to the motor pump deemed necessary.



Identification of components

Refer to **Figures from 1 to 5** at the beginning of the manual.

- | | |
|--------------------|--------------------------------|
| 1. Suction | 4. Identification plate |
| 2. Delivery | 5. Fuse holder cover |
| 3. Feet | 6. Power connector |
-

Motor pump identification plate



Warning

Should the identification plate deteriorate during use, contact the Manufacturer or a Skilled Technician to have it restored.

The identification plate (4) shows the motor pump model, the serial number, the year of manufacture and the main electrical and mechanical specifications (max. flow rate, max. pressure, power supply voltage, input, etc.). It is located on the motor pump casing.

Safety device

a) Pressure switch.

This device, suitably calibrated by the Manufacturer, limits the maximum operating pressure, preventing hazardous pressure levels, when the delivery is closed or when trying to set pressure values above the maximum permitted ones.



Warning

The pressure switch is calibrated by the motor pump Manufacturer. Do not attempt to alter the settings.

b) Protection fuse.

This device stops the motor pump from working in case of excessive absorption.

If one of these trips, proceed as follows, **keeping to the indications shown in the manual of the machine in which the motor pump is integrated:**

- stop the machine and disconnect the power supply;
- release any residual pressure in the high-pressure circuit;
- replace the fuse with another suitable one (refer also to the paragraph "Specifications and technical data";
- make sure the instructions have been followed in the paragraph "Checking and connecting up to the power supply";
- connect the power supply again and repeat the start procedure.



Warning

In case these safety devices trip frequently, do not use the motor pump (and therefore the machine in which it is integrated) without first having it checked by a Skilled Technician.



Intended use



Warning

The motor pump must not be run by itself. It is only meant to be integrated in a machine.

- The motor pump must be integrated in machines used for the following purposes:
 - crop spraying and protection in agriculture and gardening;
 - pumping detergents and colours in aqueous solution;
 - pumping water for non-edible use;
 - transfer of non-viscous liquids.
- The motor pump must not be integrated in machines for pumping:
 - solutions of chemical products the compatibility of which with the materials making up the motor pump itself is not known (polypropylene, Viton®, stainless steel, Santoprene™);
 - fuels of all kinds and types;
 - nflammable liquids or liquefied gases;
 - edible liquids;
 - solvents and thinners of all kinds and types;
 - paints of all kinds and types;
 - liquids containing granules or solid parts in suspension.
- The motor pump must not be integrated in machines designed to wash: people, animals, energized electrical apparatus, delicate objects, the motor pump itself or the machine in which it is integrated.
- The motor pump is not suitable for being integrated in machines designed to operate in environments with special conditions such as, for example, corrosive or explosive atmospheres.
- For integration in machines designed to operate on board vehicles, ships or planes, contact the Manufacturer's Technical After-Sales Service, inasmuch as additional requirements may be necessary.

All other uses are to be deemed incorrect.

The Manufacturer disclaims all liability for any damage deriving from incorrect or erroneous uses.

Preliminary activities



Warning

The motor pump cannot be operated unless the machine in which it is integrated conforms to the safety requirements laid down by European Directives. Such conformity is indicated by C marking and by the declaration of conformity of the Manufacturer of the machine in which the motor pump is integrated.

- Also follow the instructions contained in the use and maintenance manual of the machine in which the motor pump is integrated.
- Make sure all deliveries are closed or connected to accessories that have been turned off (e.g., tap in "OFF" position).
- Check the tightness of the clamps connecting the pipes to their fittings.
- Make sure that the moving parts of the motor pump are suitably protected and that they are not accessible to unauthorised persons.
- Do not use the motor pump (and therefore the machine in which it is integrated) in the event of:
 - the supply cable or other important parts such as the high-pressure pipes and the safety devices being damaged;
 - its having suffered heavy knocks;
 - evident leaks of pumped liquid.



In such cases, have the motor pump and the machine in which it is integrated checked by a Skilled Technician.

- Have a Skilled Technician perform the inspections required by special maintenance.
- Wear clothing and personal protective equipment able to provide adequate protection from any high-pressure jets and chemical products used.

Carry out the preliminary activities indicated in the manual of the machine in which the motor pump is integrated.

CAUTION

- In case of operation at very low temperatures, make sure there is no ice inside the motor pump and pipes.

Checking and connecting up to the power supply



Warning

Also follow the instructions contained in the manual of the machine in which the motor pump is integrated.

- In the event of powering the motor pump with a battery, pay attention to the fact that it contains hazardous liquid, may emit explosive gas and can cause electric shocks, therefore:
 - always use protective goggles;
 - do not smoke or place heat sources near the battery;
 - do not touch both battery terminals with the hands or metal tools;
 - immediately wash any parts that come into contact with fluids leaking from the battery;
- Have the battery replaced when required only by a Skilled Technician.

Precautions concerning pumped chemical products



Warning

Also follow the instructions contained in the manual of the machine in which the motor pump is integrated.

- Store the chemical products in ventilated premises, with door equipped with lock. The products must be out of reach of children and unauthorised persons. Place hazard notices outside the premises.
- Carefully read the safety instructions and precautions on the chemical product packs, so as to be able to take suitable measures to prevent hazards affecting people and the environment. In particular, do not exceed maximum recommended concentrations and only prepare the quantity of product needed to avoid dispersion on the ground and in the water system.
- In case of contact with eyes, immediately rinse with water. In case of swallowing, do not induce vomit: immediately contact a doctor, and show him/her the pack of detergent. Avoid inhaling any gases produced.
- Always wear adequate protection gear and keep away children, unauthorised persons and personnel not adequately protected. Do not drink, eat and smoke.
- At the end of the various operations, carefully wash your hands and face.
- Carefully wash any clothes that have come into contact with the chemical products. Any contaminated items must be immediately washed.
- The chemical product containers must be disposed of through pre-sorted waste collection centres and in accordance with the laws of the country where the machine in which the motor pump is integrated is oper-



GENERAL INFORMATION - PART ONE

ating.

- During operation, avoid the chemical products reaching buildings, homes, public and private lands, gardens, roads, public and private water courses and places frequented by people and animals. Irrigation treatments near the above places must be performed in the absence of wind.

Checking and connecting up to water mains



Warning

Also follow the instructions contained in the manual of the machine in which the motor pump is integrated.

Follow the water mains connection instructions applicable in the country where the machine in which the motor pump is integrated is installed.

CAUTION

- Follow the water mains connection instructions shown in the “**Specifications and technical data**” paragraph, with special reference to the priming depth and supply pressure and temperature: in case of any doubts, contact a Skilled Technician.
- The suction of motor pump must always be equipped with a suitably-sized filter: frequently make sure this is clean.
- Never operate the motor pump without water supply.

Operation



Warning

Also follow the instructions contained in the manual of the machine in which the motor pump is integrated, with special reference to the parts relating to the safety precautions, any use of personal protective equipment (protective goggles, ear muffs, etc.) and handling.

- Before starting up the machine in which the motor pump is integrated, carefully read the machine's manual and this manual. In particular, make sure you have fully understood how the motor pump and the machine in which it is integrated work as regards liquid on/off operations.
- The motor pump and the machine in which it is integrated are not intended to be used by people (including children) with reduced physical, sensorial or mental capacities, or who lack the experience and expertise, unless they are able to benefit, through the intermediation of a person responsible for their safety, from supervision or instructions concerning the use of the motor pump and of the machine in which it is integrated.
- Children must be supervised to make sure they do not play with the motor pump and with the machine in which it is integrated.
- During operation:
 - always keep an eye on the motor pump and the machine in which it is integrated and out of the reach of children; in particular, be very careful when using near nurseries, clinics and old-people's homes, in case of children, elderly people or disabled people without supervision;
 - do not direct high-pressure jets against materials containing asbestos or other substances harmful for the health;
 - do not cover the motor pump and the machine in which it is integrated and do not place them where ventilation is prevented (remember this above all when using the machine in closed environments);
 - when not in operation and before doing any jobs, perform the operations described in the “stop” para-



graph. In particular, do not leave the motor pump and the machine in which it is integrated connected to the power supply and release any residual pressure;

- operating pressure must never exceed the maximum value set for the motor pump (see also “**specifications and technical data**” paragraph);
- **WARNING.** Do not use the motor pump or the machine in which it is integrated near people if these are not wearing personal protective equipment.
- **WARNING.** Do not direct high-pressure jets against yourself or other people to clean clothes or footwear.
- **WARNING.** High-pressure jets can be hazardous if incorrectly used. High-pressure jets must not be directed against people, energized electrical appliances or the motor pump itself or the machine in which it is integrated.
- **WARNING.** Explosion risk - Do not spray inflammable liquids.
- Read the “CheCking And ConneCting up to the power supply” paragraph carefully.
- Read the “preCAutions ConCerning pumped ChemiCAL produCts” paragraph carefully.
- Keep clear of moving parts of the motor pump and of the machine in which it is integrated, even if these are adequately protected.
- Do not remove the guards of the moving parts.
- Do not touch pipes containing liquids under pressure.
- Do not perform maintenance operations on the motor pump and on the machine in which it is integrated if this is operating.
- Read the “intended use” paragraph carefully.
- Do not modify in any way the installation conditions of the motor pump. In particular, do not modify the fastening, the hydraulic connections and the guards.
- Do not deactivate or tamper with the controls and the safety devices.

Perform the steps relating to the operation indicated in the manual relating to the machine in which the motor pump is integrated; unless otherwise indicated, in relation to the motor pump, the following should be remembered.

- a) The motor pump can only be primed if the pressure in the delivery circuit is reset, which can be done, for example, by opening one or more taps on the machine in which the motor pump is integrated.
- b) The pressure can be adjusted from the relative suitable device on the machine in which the motor pump is integrated.
- c) The pressure switch causes the motor pump to stop whenever the delivery flow is stopped (for example by closing a lance); the motor pump starts to operate immediately when the delivery flow is restarted (for example by opening a lance).

CAUTION

- To permit fast motor pump priming, proceed as indicated at previous point a) every time the pump has to be primed again.
- Do not operate the motor pump:
 - if it is too noisy and/or fluid is dripping from it: in this case have it checked by a **Skilled Technician**;
 - when exposed directly to sunlight, with ambient temperature above 35 °C (95 °F).



Stopping, cleaning and decommissioning



Warning

Follow the instructions regarding stopping, cleaning and decommissioning contained in the manual of the machine in which the motor pump is integrated.

STOP



Warning

Always make sure that, once stop operations have been performed, no part of the motor pump and of the machine in which it is integrated is moving and no pipes contain liquid under pressure.

Perform the stop operations contained in the manual of the machine in which the motor pump is integrated; unless otherwise indicated, in relation to the motor pump, remember the following:

- Reset the delivery pressure as described at point a) of the "operation" paragraph.
- Disconnect the power supply.
- Wait for the motor pump and the machine in which it is integrated to cool down.



Warning

Once the motor pump and the machine in which it is integrated have cooled down, be careful:

- **not to leave them unattended in the presence of children, elderly people or disabled persons without supervision;**
- **to arrange them in a stable position without any risk of falling;**
- **not to put them in contact or in the immediate vicinity of inflammable materials.**

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Cleaning and decommissioning



Warning

Read the "Precautions concerning pumped chemical products" paragraph carefully.

- All cleaning jobs must only be performed after carrying out the operations described in the "stop" paragraph, meaning **without any moving parts, no pipe full of liquid under pressure and only after complete cooling.**
- **In particular, always remember to disconnect the power supply.**
- Any cleaning jobs must be performed in conditions of total stability.
- To clean, do not use thinners or solvents.

CAUTION

- Before proceeding to clean and decommission the motor pump, remember to run it for a few minutes with clean water so as to clean the ducts and internal parts and remove the chemical products used.
- Do not leave the motor pump stopped with chemical products inside.
- **The motor pump must be protected against freezing.**
In very cold environments, to prevent the ice from forming inside, before decommissioning, it is best to suction a car anti-freeze product and then proceed to fully expel it. If it is not possible to protect the motor



pump this way, before starting it, take it to a warm environment for long enough to melt any ice inside. Failure to do so could cause serious damage to the motor pump.



Warning

The rinsing fluids and the antifreeze liquid must be suitably disposed of and not discarded in the environment.

Maintenance



Warning

Follow the maintenance instructions contained in the manual of the machine in which the motor pump is integrated.

- All maintenance jobs must only be performed after carrying out the operations described in the "stop" paragraph, meaning **without any moving parts, no pipe full of liquid under pressure and only after complete cooling.**
In particular, remember to always disconnect the power supply.
- Any maintenance jobs must be performed in conditions of total stability.
- **WARNING.** To ensure the safety of the motor pump, only use original spare parts supplied by the Manufacturer or approved by it.

Routine maintenance

Perform the routine maintenance jobs shown in the manual of the machine in which the motor pump is integrated; unless otherwise indicated, in relation to the motor pump, remember the following.

ROUTINE MAINTENANCE	JOB
After every use.	<ul style="list-style-type: none"> • Check and if necessary clean the suction filter. • Check any power cable, high-pressure pipes and clamp tightness. <p>In the event of one or more parts being damaged, do not use the machine and contact a Skilled Technician.</p>
Every 50 hours.	<ul style="list-style-type: none"> • Check the integrity of the suction circuit. • Check the fastening of the motor pump to the structure of the machine in which it is integrated. <p>In the event of such fastening being unstable, do not use the machine and contact a Skilled Technician (1).</p>

⁽¹⁾ Checks must be made more frequently if the motor pump operates where there are strong vibrations.



Special maintenance



Warning

Special maintenance jobs must only be performed by a Skilled Technician.

Perform the special maintenance jobs shown in the manual of the machine in which the motor pump is integrated; unless otherwise indicated, in relation to the motor pump, remember the following:

MAINTENANCE SCHEDULE	JOB
At the end of the season or once a year.	• Check the safety devices.

CAUTION

- The data shown on the chart are approximate. More frequent jobs may be necessary in case of particularly heavy-duty use.

Dismantling and disposal

Only qualified persons must be allowed to dismantle the motor pump and this operation must be performed in compliance with the laws applicable in the country where the machine in which it is integrated has been installed.



Warning

Before scrapping the motor pump, make it unusable, for example by cutting the power cable and make harmless those parts that could be hazardous for children playing with the motor pump.



Troubleshooting



Warning

Also follow the instructions contained in the manual of the machine in which the motor pump is integrated.

- Before doing any jobs, perform the operations described in the “stop” paragraph.
In the event of not being able to restore the correct operation of the motor pump with the aid of the information contained on the following table, contact a Skilled Technician.

PROBLEMS	CAUSES	REMEDIES
The electric motor fails to start or stops during operation.	One of the safety devices has triggered of the plant to which the machine that integrates the motor pump is connected (fuse, differential switch, etc.).	Reset the safety device. If it triggers again, do not use the machine and contact a Skilled Technician .
	Blown fuse.	Replace the fuse. Follow the instructions in the “ Safety devices ” paragraph.
The pump does not prime.	Suction of air.	Check the integrity of the suction circuit.
	Delivery circuit under pressure.	Reset the pressure of the delivery circuit.
The pump fails to reach max. pressure.	Pressure adjusting device not set to maximum pressure.	Adjust the device to set the required pressure.
	Not enough water supply or priming too deep.	Make sure the water supply flow rate or priming depth is in compliance with the indications in the “ Specifications and technical data ” paragraph.
	Suction circuit blockages.	Check the suction circuit (especially make sure the suction filter is clean).
Irregular pressure and flow rate (pulsating).	Air suction.	Check the integrity of the suction circuit.
	Suction filter dirty.	Clean the filter.
	Not enough water supply or priming too deep.	Make sure the water supply flow rate or priming depth is in compliance with the indications in the “ Specifications and technical data ” paragraph.
	The motor pump has not completed priming.	Prime the pump according to the indications of the “ Operation ” paragraph.
The motor pump starts and stops continuously.	Leak in the delivery circuit and/or from a device.	Check the delivery circuit and the devices.
Too much noise.	Suction circuit blockages.	Check the suction circuit (especially make sure the suction filter is clean).
	Water supply temperature too high.	Keep to the temperatures indicated in the “ Specifications and technical data ” paragraph.



TECHNICAL INFORMATION - PART TWO (for Skilled Technicians only)



Warning

This part of the manual is dedicated to Skilled Technicians and is not intended for users of the machine in which the motor pump is integrated.

Unpacking



Warning

During unpacking, always wear gloves and protective goggles, to prevent injuring hands and eyes.

- The packaging elements (plastic bags, staples, etc.) must not be left within reach of children as they represent potential hazard sources.
- Packaging components must be disposed of according to the regulations in force in the country where the machine in which the motor pump is integrated has been manufactured.
Plastic packaging must not be discarded in the environment.
- After unpacking the motor pump, make sure no parts are missing, all parts are in perfect condition and the identification plate is in place and legible.
In case of any doubt, do not install the motor pump, but contact the Manufacturer.
- This manual must always accompany the machine in which the motor pump is integrated and made available to the end user.

Standard fittings

Make sure the purchased product consists of the following elements:

- motor pump;
- use and maintenance manual;
- declaration of incorporation.

In case of problems, contact the Manufacturer.

Optional accessories

The standard motor pump equipment can be integrated with the following range of accessories:

- battery connection cable, including ON/OFF switch;
- suction and delivery fittings.

Installation



Warning

The Skilled Technician must abide by the installation instructions in this manual.

The machine in which the motor pump is integrated must be made in such a way as to ensure conformity with the safety requirements indicated in the European Directives. This fact is guaranteed by C € markings and by the Declaration of Conformity of the Manufacturer of the machine in which the motor pump is integrated.

- The motor pump can be installed in any position, however, when installing vertically maintain the head

- pointing downwards in order to prevent liquid entering the electric motor in the event of leakage.
- The motor pump must be stably fastened, without pressing excessively on the rubber feet, as these act as dampers and help to reduce noise and vibrations.

For the main formats used in the installation, refer to **Fig. 7 and 8**.

Applications



Warning

The motor pump must operate without exceeding the pressure limits as shown on the identification plate (4).

The pump applications must be made following good mechanical engineering practices. The Manufacturer's After-Sales Service is at the disposal of the Skilled Technician to provide all necessary information.

Power connection



Warning

Follow the connection instructions shown in the "Specifications and technical data" paragraph.

- The motor pump power supply must comply with the data indicated on the plate (4): in particular, the power voltage must not deviate by $\pm 10\%$ and the power source must be of a suitable power.
- If the power cable is too short, an extension cable may be used provided it is not longer than 5 m/16 ft and that the cable section is at least 2.5 mm² <AWG 14> (AR 26.5 DFL - AR 13.8 PFL 4 mm² <AWG 12>).
- Ensure polarity in the connections:
 - red cable . positive (+);
 - black cable . negative (-).
- When connecting the motor pump to a battery, proceed as follows:
 - if present, disconnect the earth cable;
 - connect the red cable to the positive pole (+) of the battery;
 - connect the black cable to the negative pole (-) of the battery;
 - if present, reconnect the earth cable.
- When disconnecting the motor pump from a battery, proceed as follows:
 - if present, disconnect the earth cable;
 - disconnect the black cable from the negative pole (-) of the battery
 - disconnect the red cable from the positive pole (+) of the battery;
 - if present, reconnect the earth cable.



TECHNICAL INFORMATION - PART TWO (for Skilled Technicians only)

Hydraulic connection



Warning

Follow the connection instructions shown in the “Specifications and technical data” paragraph.

- The suction pipes must have a nominal pressure equal to 5 bar (73 psi).
- The delivery pipes must have a nominal pressure not below max. motor pump pressure.
- Do not tighten the suction and delivery fittings to a torque of more than 5 Nm (45 lbf in).
- All the pipes must be firmly fastened with clamps to the respective fittings.

For the hydraulic suction and delivery connections, refer to the following table and to **Fig. 6**, which represents a generic diagram of a possible machine in which the motor pump is integrated.

- | | |
|---------------------------|--|
| a. Tank | d. Motor pump |
| b. Suction filter | e. Delivery circuit |
| c. Suction circuit | f. Spray lance (example of accessory) |

The connections to suction and delivery of the motor pump must be done according to the model considering the couplings and minimum internal pipe diameters illustrated in the following table:

Model	Coupling	Minimum internal pipe diameter
AR 3.8 DFL	hose holder Ø 10 mm (3/8")	10 mm (3/8")
AR 5.3 DFL AR 8.3 DFL	3/8 NPT female	13 mm (1/2")
AR 11.4 DFL AR 15.1 DFL AR 20.8 DFL	1/2 NPT female	
AR 26.5 DFL		
AR 13.8 PFL		19 mm (3/4")

CAUTION

- The suction pipes must have a minimum internal diameter as shown in the previous table and **must not present any blockages**.
- The delivery pipe should have a minimum internal diameter as shown in the previous table.
- Do not use metal pipes and fittings to connect the suction and delivery.
- The pipe material must be compatible with the fluids used.
- Make sure that the pipes do not come into contact with sharp edges.
- The suction and delivery pipes must be at least 450 mm (18 in) long.
- Make sure that any residues of the materials used to seal the suction and delivery fittings do not get inside the motor pump and/or the pipes.
- Use a 50 Mesh filter on the suction.





AR 3.8 DFL

图 1



CN



AR 5.3 DFL

图 2



AR 8.3 DFL

图 3



CN

图 4

AR 11.4 DFL



AR 15.1 DFL

图 5



AR 20.8 DFL

图 6

CN



AR 26.5 DFL

图 4



CN

图 5

AR 13.8 PFL

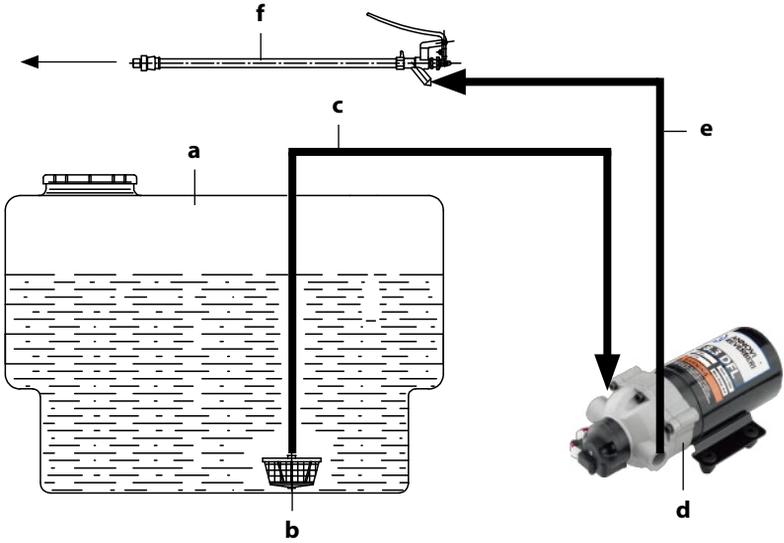


图6

CN

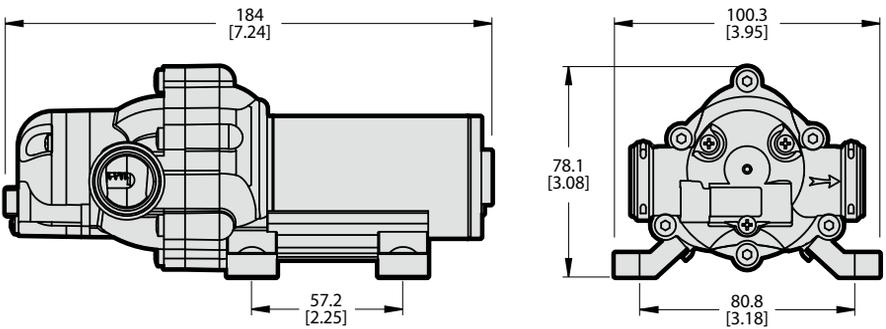
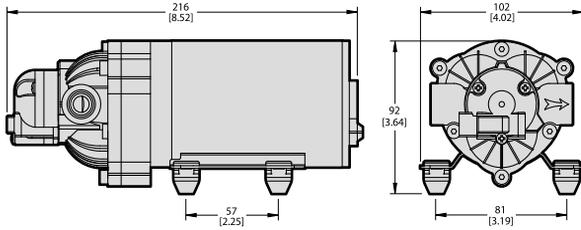
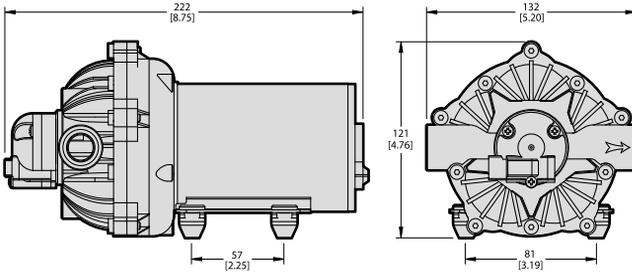


图7

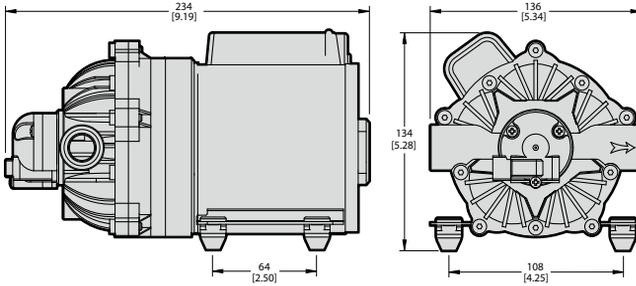
AR 3.8 DFL



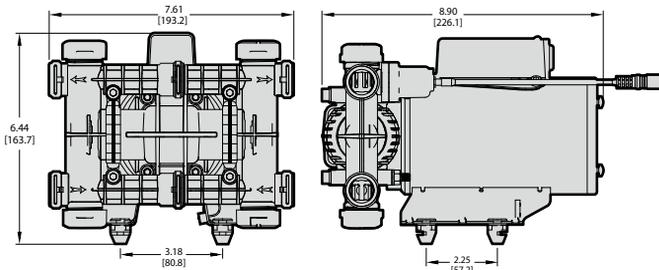
AR 5.3 DFL - 8.3 DFL



AR 11.4 DFL - AR 15.1 DFL - AR 20.8 DFL



AR 26.5 DFL



AR 13.8 PFL



第一部分 - 综合信息

前言

本手册分为两部分。

第一部分用于指导终端用户和技术人员操作和维护电机泵；第二部分专用于指导技术人员如何将电机泵安装于整机上。

专业技术人员包括：

- 配备电机泵的整机制造商（例如：农药喷洒车）
- 售后服务中心那些经过专业培训和授权，对电机泵以及配有电机泵的设备进行维修保养的专业技术人员。电路部分必须由技术娴熟且具备电路资格证书的专业人员进行操作、安装和维修，并且符合当前国家和地区颁布的相关法律法规。

第一部分

综合信息

请仔细阅读本手册和配有电机泵的整机使用手册：**始终严格按照手册内容规范操作**并务必仔细阅读警示标志的注解：



警告

包括所有在操作使用电机泵时要注意的重要安全指示

如未按照下列要求规范操作，可能会引起严重伤害：

- 未按照本手册及配有电机泵的整机使用手册规范操作
- 未按照手册中关于电机泵用途范围的说明使用，而扩大使用范围
- 未按照相关安全法规和安全规章制度使用电机泵
- 擅自修改安全装置，例如更改最大工作压力等
- 错误的组装设备
- 错误的维护和保养
- 未经许可擅自更改水泵外观和参数
- 使用盗版的、旧的或不匹配水泵型号的配件
- 未经专业技术人员操作

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请妥善保管本手册



警告

本手册包括电机泵整机安装规范，请仔细阅读

本手册为电机泵产品必不可少的随箱附件，务必妥善保管，以备随时查阅。本手册包含安全预防规范，请严格遵守，防止对操作者或周围人群造成伤害。如果本手册丢失或缺损，请向AR公司再次索取。在整机组装的过程中，如果需要迁移电机泵，请连同本手册一起打包。AR保留对本手册更正及说明的权利，恕不另行通知而不承担任何责任。



标识注解

标识：



警告

该标识下的文字内容，如果不引起注意，可能会引发对操作人员或周围人员的伤害。

标识：

注意

该标识下的文字内容，如果不引起注意，可能会损坏电机泵。

这些重要的注意事项应始终牢记。

水泵和制造商标识

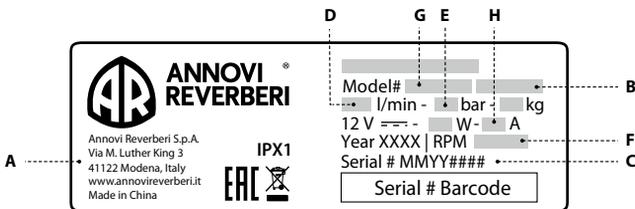
参数铭牌

铭牌包含安全操作的重要信息，每个水泵上面都附有该标牌。

- A. 制造商的名称和地址
- B. 型号
- C. 序列号
- D. 最大流量 (l/min)
- E. 最大操作压力 (bar)
- F. 最高转速
- G. 水泵编号
- H. 最大电流 (A)

制造商的名称和地址

Annovi Reverberi Spa
Via Martin Luther King, 3
41122 Modena (MO) - Italy



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EUROPEAN DECLARATION OF INCORPORATION

Annovi Reverberi S.p.A.

Via Martin Luther King, 3 - 41122 - Modena - Italy

We, Annovi Reverberi S.P.A., declare under our sole responsibility that the partly completed machinery:

Description: Diaphragm Pumps

Year of construction: XXXX

Serial number: ##MY####

With S/N starting XXXMY0001. **XX** is the two-digit pump code. **M** is the month, (Jan=1, Feb=2, Mar=3...Oct=A, Nov=B, Dec=C).
Y is the year, (2015=5, 2016=6, 2017=7...2020=A, 2021=B...) and **0001** is a consecutive number.

Brand: Annovi Reverberi

Model: AR 3.8 DFL, AR 5.3 DFL, AR 8.3 DFL, AR 11.4 DFL, AR 15.1 DFL, AR 20.8 DFL, AR 26.5 DFL, AR 13.8 PFL

Fulfills the following Essential Health and Safety Requirements in accordance with Annex I of Directive 2006/42/EC:

1.1.2-1.1.3-1.1.5-1.3.2-1.3.4-1.3.7-1.3.8-1.3.8.1-1.3.8.2-1.4.1-1.5.1-1.5.4-1.5.5-1.5.6-1.5.8-1.5.10-1.5.11-1.5.13-1.6.1
1.6.2-1.7.1-1.7.1.1-1.7.2-1.7.4-1.7.4.1-1.7.4.2

The partly completed machinery is also in conformity with the following European Community directives:

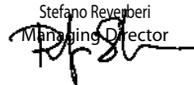
DIRECTIVE 2006/42/EC - DIRECTIVE 2014/30/EU - DIRECTIVE 2011/65/EU

And the following standard(s) and other normative document(s):

EN 60335-1:2012+A11:2014 - EN ISO 12100: 2010 - EN ISO 14982:2009

We declare that the relevant technical documentation has been compiled in accordance with part B of Annex VII of Directive 2006/42/EC and we undertake to send relevant information on the partly completed machinery by post or electronically, in response to a request by the national authorities. The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive and subsequent modifications, where appropriate.

Modena, Italy
April 10, 2018

Stefano Reverberi
Managing Director




规格和技术参数

电机泵由一台隔膜泵和一台集成的12V的直流永磁电机组成。
水泵具有自吸能力且无需润滑油。(AR13.8 PFL除外)
除了AR13.8系列,其它系列水泵均可无水运行。

		AR 3.8 DFL	AR 5.3 DFL	AR 8.3 DFL	AR 11.4 DFL
电源接入 12V电源		12 V			
最大输入功率	(W)	48	96	96	120
最大输入电流	(A)	4	8	8	10
保险丝负荷	(A)	5	15	15	15
液压连接 最高水温		60			
最低水温		5			
最大自吸深度		2.5			
性能 最大流量	l/min	3.8	5.7	8.3	11.4
最大压力时流量	l/min	2.9	3.8	5.1	7.0
最大压力	bar	2.7	6.9	4.8	4.1
重量	kg	0.9	2.2	2.2	2.5



第一部分 - 综合信息

		AR 15.1 DFL	AR 20.8 DFL	AR 26.5 DFL	AR 13.8 PFL
电源接入 12V电源		12 V $\overline{=}$			
最大输入功率	(W)	156	204	276	240
最大输入电流	(A)	13	17	23	20
保险丝负荷	(A)	15	20	25	25
液压连接 最高水温	°C	60			
最低水温	°C	5			
最大自吸深度	m	2.5	2.5	3.0	1.8
性能 最大流量	l/min	15.1	20.8	26.5	7.6
最大压力时流量	l/min	10.5	15.2	19.7	4.9
最大压力	bar	4.1			13.8
重量	kg	2.5	2.5	4.3	5.9

上述数据准确真实。

当水泵需要升级和改进时，AR保留对上述数据进行更正的权利。



部件注解

- | | |
|--------|---------|
| 1. 进水口 | 4. 铭牌 |
| 2. 出水口 | 5. 保险丝盒 |
| 3. 固定架 | 6. 电源线 |

水泵铭牌



警告

如在机器使用过程中铭牌遭到损坏，请联系厂家或技术服务人员重新更换。

铭牌(4)上的内容包括水泵型号、序列号、生产年份、电路信息和运行参数(最高流量、最大压力、输入电压等等)。铭牌贴在水泵外壳上。

安全装置

a. 压力开关

压力开关由厂家在出厂时设置到最大操作压力值，当水泵停机或调压阀压力值高于这个数值时，会起到保护作用。



警告

压力开关的数值由厂家设置，禁止私自更改参数。

b. 保险丝

保险丝在机器运行时遇到电流过大时可起到停机的作用。

下列情况如有发生，请翻阅本手册整机组装部分：

- 意外停机或连接不上电源
- 出现压力无故缺失
- 更换保险丝（参阅“技术参数”部分）
- 需要参阅“检查和连接电源”部分时
- 重新连接电源并重启设备时



警告

为了避免这些安全装置频繁启动运行，在没有专业技术人员指导下，不要运行水泵和组装整机。



主要用途



警告

禁止水泵单独运行，必须组装在整机上运行。

- 组装在整机上的水泵可用于以下用途：
 - 农田、园林的农药喷洒
 - 水溶性洗涤剂 and 涂料喷涂
 - 喷洒非饮用水
 - 喷洒非粘稠液体
 - 组装在整机上的水泵禁止用于以下用途：
 - 在不确定整机装配所涉及材质(如聚丙烯、氟橡胶、不锈钢、热塑橡胶等)的情况下喷洒含有化学制剂成分的液体。
 - 喷洒所有类型的燃油。
 - 喷洒易燃液体和液化气
 - 喷洒可食用液体
 - 喷洒各种类型的溶剂和稀释剂
 - 喷洒各种类型的油漆
 - 喷洒含有颗粒和悬浮物的液体
 - 组装在整机上的水泵禁止用于清洗：人、动物、通电电气设备、易碎物品和装配水泵的整机本身
 - 组装在整机上的水泵禁止用于某些特殊工作环境，如需要腐蚀性的工作或爆破工作
 - 如果需要把水泵安装在卡车、轮船或飞机上，请提前联系厂家，技术售后部门会提供更多帮助
- 以上未提到的用途也被视为不正确的。**

对于不正确的使用引起的后果AR不承担任何责任。

准备工作



警告

水泵在安装到整机上之后，在没有达到欧盟安全标准的情况下不能开机运行。组装工厂应严格按照CE安全标准执行。

- 请按照本手册的内容使用和维护装配水泵的整机
 - 确保机器上所有部件和附件都处于关闭状态(例如：出水龙头已关闭)
 - 确保水管卡箍完好密封
 - 非操作人员不可随意触碰设备中可移动的部件
 - 下列情况下不可运行水泵和整机：
 - 电源线或其他重要部件如高压管和安全装置损坏
 - 出现不正常的异响
 - 出现渗液现象
- 如果出现这些情况，请联系专业技术人员解决
- 如果需要进行特殊的维护保养，请安排专业技术人员进行操作
 - 如果进行高压清洗或化学试剂喷洒，请穿防护服或其他符合要求的防护装备
- 整机运行前的准备工作参阅本手册的内容执行**

注意：

- 如果在低温环境下运行机器，需确保水泵和水管内部没有结冰



检查并连接电源



警告

请按照本手册的内容使用和维护装配水泵的整机

- 如果水泵依靠电池驱动，需留意是否有漏液、气体爆燃和漏电，同时做到以下几点：
 - 佩戴护目镜
 - 不要在电池附近吸烟和摆放热源
 - 不要用手或金属工具触碰电池两级
 - 如果接触到电池渗液，需立即清洗
- 如果需要更换电池，必须由专业技术人员操作。

关于化学品使用的安全常识



警告

请按照本手册的内容使用和维护装配水泵的整机

- 化学品应存放在通风且有门锁的场所，必须禁止无关人员和儿童接触到化学品，在入口处需张贴警告标识。
- 仔细阅读安全事项并确保化学品外包装完整，这样可以防止化学品泄漏伤害到周围人员和环境。特别需要注意的是，为了避免化学品洒到地上和混入水循环系统，化学品的使用量不要超过水泵运转时的实际需求。
- 如果化学品进入到眼睛里，需立即用清水清洗。如果不慎吞下化学品，不要尝试呕吐，需立即联系医生，给医生看化学品的说明标签。应避免吸入化学品的气味。
- 应时刻佩戴防护装备并且让儿童、无关人员以及没有佩戴防护设备的人员远离化学品。操作时不要进食和吸烟。
- 作业结束时，需仔细清洗双手和脸。
- 需仔细清洗有机会接触到化学品的衣物，如果衣物沾染上的化学品，需立即清洗。
- 盛装化学品的容器必须符合当地安全法规通过分类妥善安置。
- 在操作过程中，应避免把化学品带入办公楼、家庭、私家花园、公路、河流以及人群、动物聚集地。如果在上述地点附近进行作业，必须确保周围无风。

检查并连接水管



警告

请按照本手册的内容使用和维护装配水泵的整机。

严格按照当地法规连接水路系统。

注意：

- 参阅手册中关于水路系统**技术数据**部分连接水管，在水管长度、压力、温度方面如有特殊要求，需联系专业技术人员。
- 水泵的进水口必须始终安装合适尺寸的过滤网，并经常进行清洁。
- 水泵不工作时要关闭进水。



第一部分 - 综合信息

操作注意事项



警告

请按照本手册的内容使用和维护装配水泵的整机，特殊部位请佩戴安全装备，如护目镜、耳罩等。

- 在机器启动前，请仔细阅读整机说明手册和本手册，确保完全理解水泵和整机进出水的工作原理。
- 身体有残疾、有精神疾病、缺乏实际操作经验和操作知识的人群（包括儿童）不能操作装配水泵的整机，除非有专业技术人员或其他监管措施可以确保他们的安全。
- 必须禁止儿童操作设备。
- 在操作设备过程中：
 - 需始终关注不要让儿童靠近机器；如果在幼儿园、医院和敬老院附近使用机器，要特别注意不要让儿童、老人和残疾人靠近机器；
 - 不要把高压喷嘴朝向对身体有害的物体喷射，如石棉；
 - 不要在设备上面覆盖物体，不要把设备放置在不通风的地方（当在封闭环境中使用机器时切记）
 - 当设备停止运行或运行之前，需按照“停机”部分的内容进行操作。尤其注意，设备带电和没有卸压时不能离开。
 - 调节压力时不能超过调压阀的最大值（参阅“技术参数”部分）
- **警告。**如果设备旁的人员没有佩戴防护装备，禁止使用设备。
- **警告。**禁止将高压喷嘴对着自己或其他人员清洗衣物和鞋子。
- **警告。**如果使用不当，高压喷嘴会对人员造成伤害。禁止将高压喷嘴对着人、电器和设备本身。
- **警告。**爆炸危险！禁止喷洒易燃液体。
- 需仔细阅读“检查并连接电源”部分。
- 需仔细阅读“关于化学品使用的安全常识”部分。
- 无论是否防护得当，需始终留意设备中可移动部件的安全。
- 不要放松对设备中可移动部件安全的警惕。
- 不要在带压情况下触碰水管出水口。
- 如果设备在运行，不要对设备进行维护和保养。
- 需仔细阅读“主要用途”部分。
- 不要对设备进行任何更改，尤其是固定装置、液压装置和保护装置。
- 不要使用控制工具和安全装置干预设备运行或让设备强制停机。

请按照手册中的说明连接安装整机，如果有些情况手册中没有提及，请按照以下注意事项操作：

- a. 如果在设备运行过程中调整压力，只需要调试一下水泵就可以了。例如，点击出水一次或几次即可。
- b. 可以通过在设备上连接相应的调压装置来调整压力。
- c. 在设备水循环系统停止时，压力开关会确保设备停机（例如：关枪）；当水循环系统重新开始工作时，设备会自动开机（例如：开枪）

注意

- 每次重启水泵时如要继续上述 a 的状态，可以快速启动水泵。
- 下列情况禁止运行水泵：
 - 水泵运行时噪音很大或有渗液现象，需联系**专业技术人员**
 - 当设备暴露在阳光下，且室外温度高于35°C



停机 / 清洁 / 关机



警告

请按照本手册关于水泵及整机的内容执行停机、清洁和关机流程操作。

停机



警告

当执行停机操作时，不要移动水泵及整机，不要试图清空水管内的液体。

按照本手册关于水泵及整机的内容执行停机流程操作；如果有些情况手册中没有提及，请按照以下注意事项操作：

- 重置压力时参阅“操作注意事项”中的a段落
- 断开动力输入
- 等待水泵及整机冷却下来



警告

当水泵及整机冷却下来后，请注意以下事项：

- 当有儿童、老人或残疾人在场时不要离开设备
- 找一个没有坠落风险的稳固位置妥善安置
- 不要让设备接触或安置在易燃物附近

清洁 / 关机



警告

仔细阅读“关于化学品使用的安全常识”部分

- 在“停机”段落中提到的所有注意事项，包括**不移动设备、水管中已排空液体以及完全冷却后**，才能进行清洁工作。
尤其是要断开动力输入。
- 清洁工作要确保在设备稳固的条件下进行。
- 清洁时不要使用稀释剂和溶剂。

注意

- 在清洁和关机前，让机器多运行几分钟，确保把水管和机器内部的化学试剂排空。
- 如果化学试剂没有排空，不要让机器停转。
- **水泵必须要做防冻保护。**
在低温环境下，要防止内部结冰，在关机前，要把机器内部的液体全部吸出。如果这个办法难以实现，在启动前，需要把设备移至温暖环境下放置足够长的时间让内部的冰融化。否则会使水泵受到严重损害。



警告

清洁液和防冻液必须为环保产品



保养



警告

请按照本手册的内容保养装配水泵的整机

- 在“停机”段落中提到的所有注意事项，包括不移动设备、水管中已排空液体以及完全冷却后，才能进行保养工作。

尤其是要断开动力输入。

- 保养工作要确保在设备稳固的条件下进行。
- 警告。**为确保水泵运转顺畅，只能使用厂家提供或授权的原装配件。

常规保养

请按照本手册的内容常规保养装配水泵的整机；

常规保养	保养内容
每次使用之后	<ul style="list-style-type: none"> 检查是否需要清洁过滤器 检查电源线、高压水管和固定卡箍 如果发现上述配件损坏，禁止运行机器并及时联系 专业技术人员
每50个小时	<ul style="list-style-type: none"> 检查水循环系统是否完好 检查水泵与整机的联接件是否紧密 如果发现联接件异常，禁止运行机器并及时联系 专业技术人员 ⁽¹⁾

⁽¹⁾ 如果水泵在运行时出现强烈的振动，必须经常进行检查。

特殊保养



警告

特殊保养必须由专业技术人员操作。

请按照本手册的内容保养装配水泵的整机；如果有些情况手册中没有提及，请按照以下注意事项操作：

保养周期	保养内容
每个季度或每年	<ul style="list-style-type: none"> 检查安全装置

注意

- 常规保养数据参见表格，如果设备使用频繁，需增加保养频率。

拆解和报废安置

必须由有资质的人员拆解水泵，并且操作流程必须符合当地安全法规。



警告

报废一台水泵之前，需要确认这台水泵确实不能运转，例如剪断电源线，使这些可能被儿童玩耍的部件不会伤害到它们。



常见问题



警告

遇到问题时，请按照本手册的内容操作。

- 开始解决问题之前，要按照“停机”段落中提到的所有注意事项使设备停止运转，否则不能有效的按照手册中的方法解决问题，并需联系专业技术人员。

问题	原因	处理方法
电机泵无法运行或关闭	设备上的某一个安全装置被触发了 (保险丝、差速开关等)	重新设置安全装置 如果再次被触发，不要运行设备，及时联系技术人员
	保险丝烧断	重新安装新的保险丝 按照“安全装置”部分的指引操作
水泵失灵	水泵内部进气	检查进水系统是否完好
	水循环系统失压	重新设置水循环系统的压力
水泵压力不够	调压装置没有设置到最大压力	调整压力值至需要的压力
	供水不足或水箱过低	确保供水充足 水箱位置符合“技术参数”中的规定
	水循环系统堵塞	检查水循环系统是否堵塞 (尤其要确保过滤器清洁)
压力和流量不稳定 (明显震动)	水泵内部进气	检查进水系统是否完好
	过滤器过脏	清洁过滤器
	供水不足或水箱过低	确保供水充足 水箱位置符合“技术参数”中的规定
	水泵的准备工作没有做好	参阅“操作注意事项”完成水泵的准备工作
水泵反复重启	水循环系统或某些位置有泄漏	检查水循环系统或可能出现泄漏的部位
噪音过大	水循环系统堵塞	检查水循环系统是否堵塞 (尤其要确保过滤器清洁)
	进水温度过高	确保进水温度符合“技术参数”标准



第二部分 - 技术信息（仅适用于专业技术人员）



警告

这部分内容仅适合专业技术人员参阅，整机用户请跳过此部分。

开箱



警告

开箱时需戴手套和护目镜，以保护双手和眼睛。

- 包装材料（包括塑料薄膜、U型钉等）必须避免被儿童接触到，规避潜在危险。
- 包装材料必须按照设备生产所在当地的规章制度妥善安置。
塑料包装材料必须按照环境流程妥善回收。
- 打开水泵外包装后，确保配件齐全并完好，铭牌的位置正确并字迹清晰。
如有疑问，先不要安装水泵，请先联系生产厂家。
- 本手册必须与设备一起存放，确保用户随时查阅。

随箱附件

水泵随箱附件包括以下几种：

- 水泵
- 使用维护手册
- 厂家声明

如有任何问题，请联系厂家。

适配附件

水泵可以连接以下类型的附件：

- 具有打开/关闭功能开关的电源线
- 进出水接头

安装



警告

技术人员必须按照手册中的内容操作安装水泵。

整机的安装流程必须符合欧盟安全标准。组装工厂应严格按照CE安全标准执行。

- 水泵可以安装在任何位置，如果需要垂直安装，请将泵头朝下，以防止液体渗进电机里。
- 水泵必须安装稳固，使用橡胶脚垫固定，从而降低噪音和振动。

通常按照图7和图8安装即可。



应用



警告

严禁将水泵的压力调整高于铭牌上标示的压力值(4)。

水泵的应用必须符合工程机械行业习惯。厂家的售后服务部委派技术人员提供所有的技术支持。

连接电源



警告

参阅“技术参数”中的连接指引

- 水泵的连接电源参数必须符合铭牌上标示的数据(4)：尤其要注意，电压不能有10%的误差，电源必须符合要求。
- 如果电源线过短，加长电源线的长度不能超过5米，粗细不能小于 2.5mm^2 <AWG 14> (AR 26.5 DFL - AR 13.8 PFL 4 mm <AWG 12>)。
- 确保正负极连接正确：
红线：正极
黑线：负极
- 水泵连接电源时按照以下顺序：
 - 首先，断开地线
 - 红线连接电瓶正极
 - 黑线连接电瓶负极
 - 最后，重新连接地线
- 水泵断开电源时按照以下顺序：
 - 首先，断开地线
 - 断开黑线与电瓶的连接
 - 断开红线与电瓶的连接
 - 最后，重新连接地线



第二部分 - 技术信息 (仅适用于专业技术人员)

液压连接



警告

参阅“技术参数”中的连接指引

- 进水管内的正常压力必须在5bar
 - 出水管内的正常压力不能低于水泵最大压力
 - 安装进水管和出水管接头时，扭矩不能超过5Nm
 - 所有水管必须使用卡箍牢固连接到连接件上。
- 关于液压进出水连接件部分，参阅下表和图6。

- | | |
|-----------|-----------|
| a. 药箱 | d. 水泵 |
| b. 进水接头 | e. 出水循环系统 |
| c. 进水循环系统 | f. 喷枪(附件) |

水泵进出水连接件和水管内径尺寸必须按照下表对应的参数匹配：

型号	连接件	水管内径
AR 3.8 DFL	外螺纹 Ø 10 mm (3/8")	10 mm (3/8")
AR 5.3 DFL AR 8.3 DFL	3/8 NPT 内螺纹	13 mm (1/2")
AR 11.4 DFL AR 15.1 DFL AR 20.8 DFL	1/2 NPT 内螺纹	
AR 26.5 DFL		19 mm (3/4")
AR 13.8 PFL		

注意

- 进水管内径必须与上表一致，**并确保不能堵塞**
- 出水管内径必须与上表一致
- 不能使用金属管和金属接头连接进出水
- 水管材质必须适合液体喷洒
- 确保水管连接件不会划伤水管，导致破损
- 进出水管的长度不能短于450mm
- 确保进出水口连接件的生料带残留物没有进入水管或水泵内部
- 进水口使用50目过滤器

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