

## ARAG® Orion Electromagnetic Flowmeter Operating Instructions and Parts Manual

### Description

The Orion electromagnetic flowmeter is a device that enables measurement of the amount of liquid flowing through it. Using a principle of electromagnetic measurement (there are no moving mechanical parts inside it), it provides the computer with a signal in proportion to the liquid flow. The computer displays the value of the flow, calculating it according to the data received from the flowmeter and the value of the previously set flowmeter constant.



### Orion Electromagnetic Flowmeter Features:

- No mechanical moving parts
- Advanced technology at an affordable price
- Performance independent from fluid density and viscosity
- Low sensitivity to turbulence
- Wide variety of flows for use in diverse applications
- High precision, typical error is 0.5%
- Pulse output is 0-12 volts, max. consumption of 300 mA (milliamps)
- Accuracy and precision saves chemical throughout the life of the system
- Working pressure up to 580 psi
- Integrates with existing rate controllers
- AMP® Sure Seal™ connection

### General Safety Information

This device is designed to be installed on agricultural machinery (crop sprayers) and for industrial applications. The flowmeter must never be used to measure the passage of hydrocarbons, flammable, explosive or toxic liquids.

**NOTE: The functional, technical and performance information provided in this manual is purely a guideline and is subject to change without notice.**

## Caution

When using the system, the flowmeter sends impulses to the computer, which according to the constant value previously set, indicates the instant flow. This flowmeter is able to detect only the passage of conductive liquids, that is, those with conductivity equal to or greater than 300  $\mu\text{S}/\text{cm}$  as indicated in the **Technical Data** table on page 6.

### WARNING!

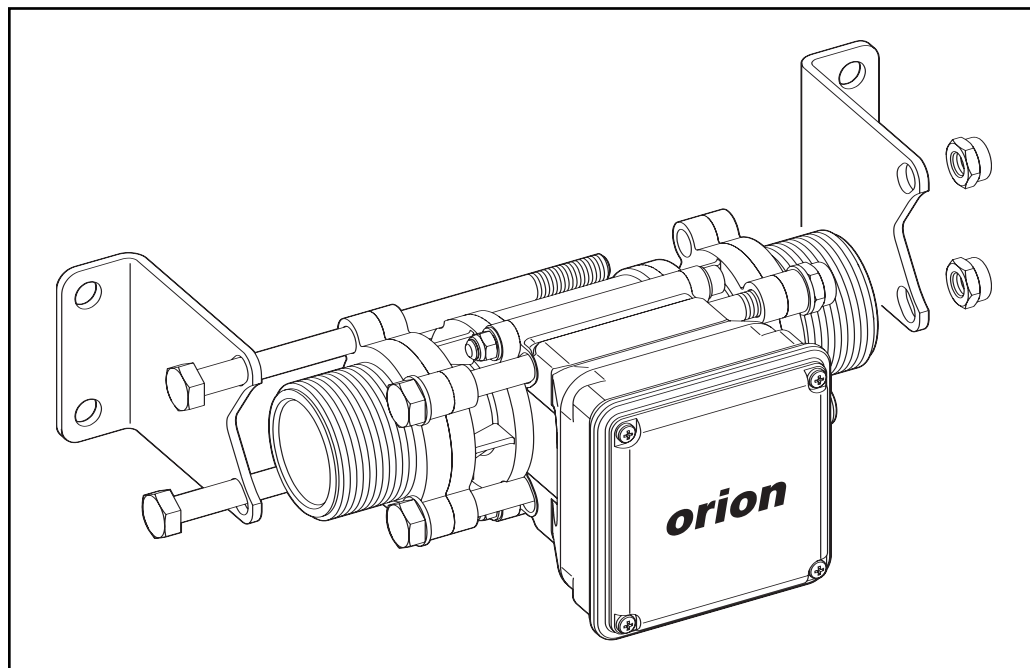
- Do not wash with high pressure.
- Comply with the specified power supply voltage (12 Vdc).
- In case of arc welding, make sure that the power supply to the flowmeter is disconnected. If necessary, disconnect the power cables.
- Use the flowmeter only within the flow-rate limits given in the **Technical Data** table on page 6. Outside these limits, the flowmeter will not be accurate.

Hypro/ARAG cannot be held responsible for damage caused to persons, animals or objects by incorrect or unsuitable use of the ORION flowmeter or its parts.

## Installation

Assemble the Orion electromagnetic flowmeter, fastening it with the special brackets (sold separately).

**Fig. 1**



Part Number	Description
V1M258-FM*	Assembly kit includes: SSbolts, nuts, washers & o-rings
463911-100	Stainless Steel Bracket

\*Assembly kit can be ordered separately.

## Installation-continued

For correct operation, it is necessary to install:

- **Assembly direction**, as indicated in Fig. 2
- **Direction of inlet – outlet of liquid**, as indicated by the arrows printed on the body of the flowmeter (Fig. 3).

Fig. 2

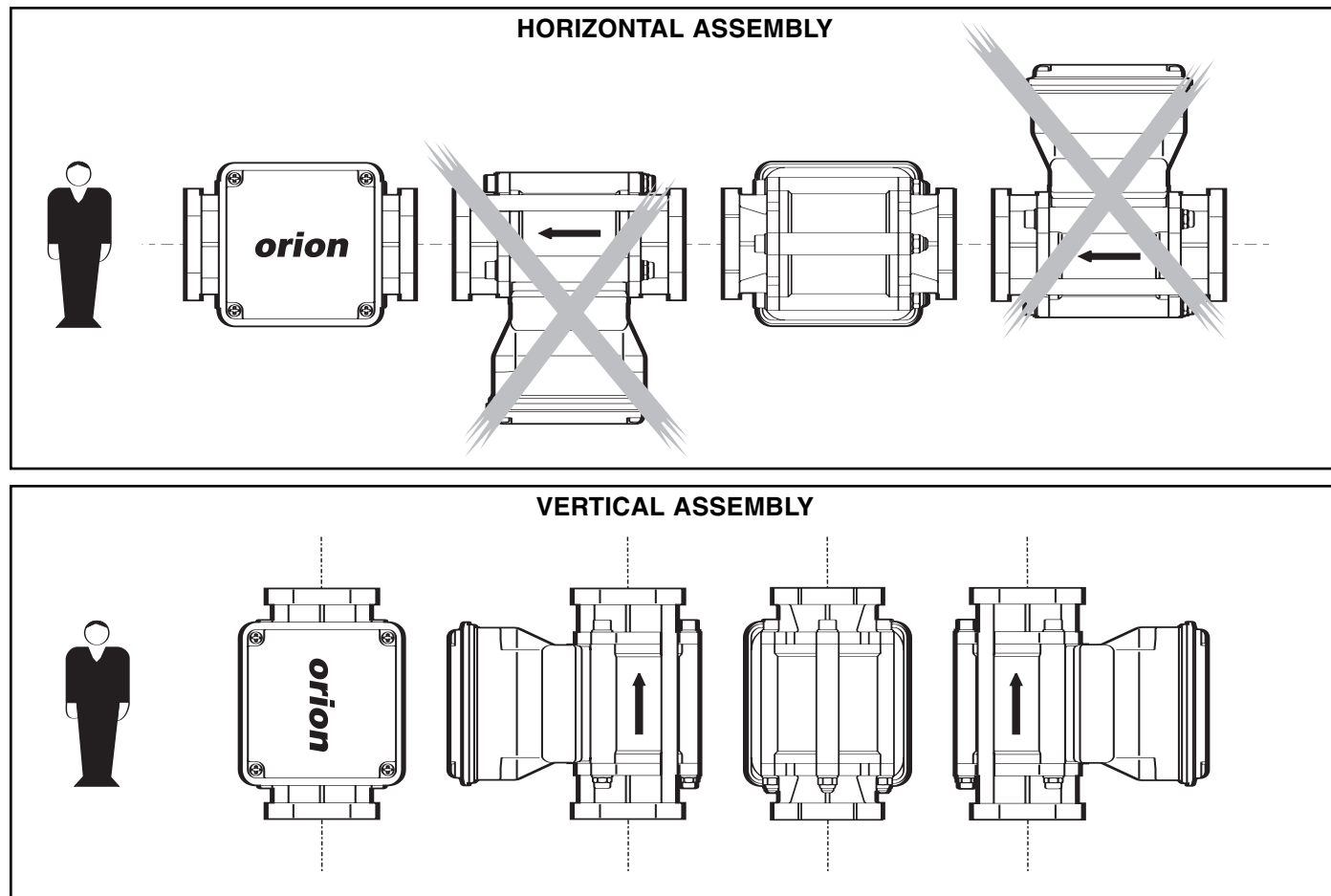
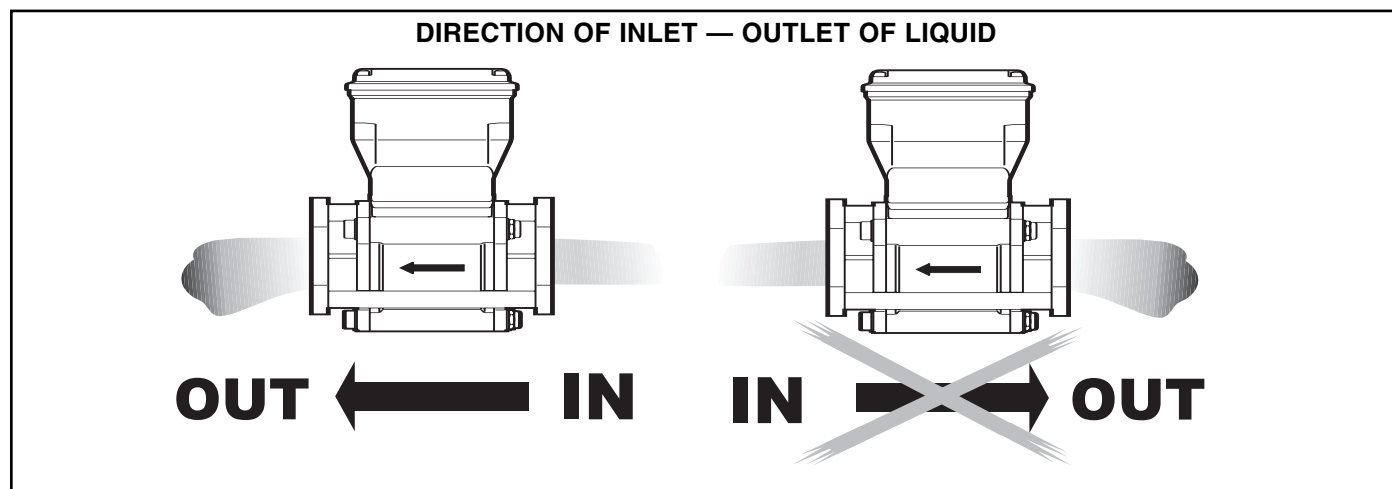


Fig. 3

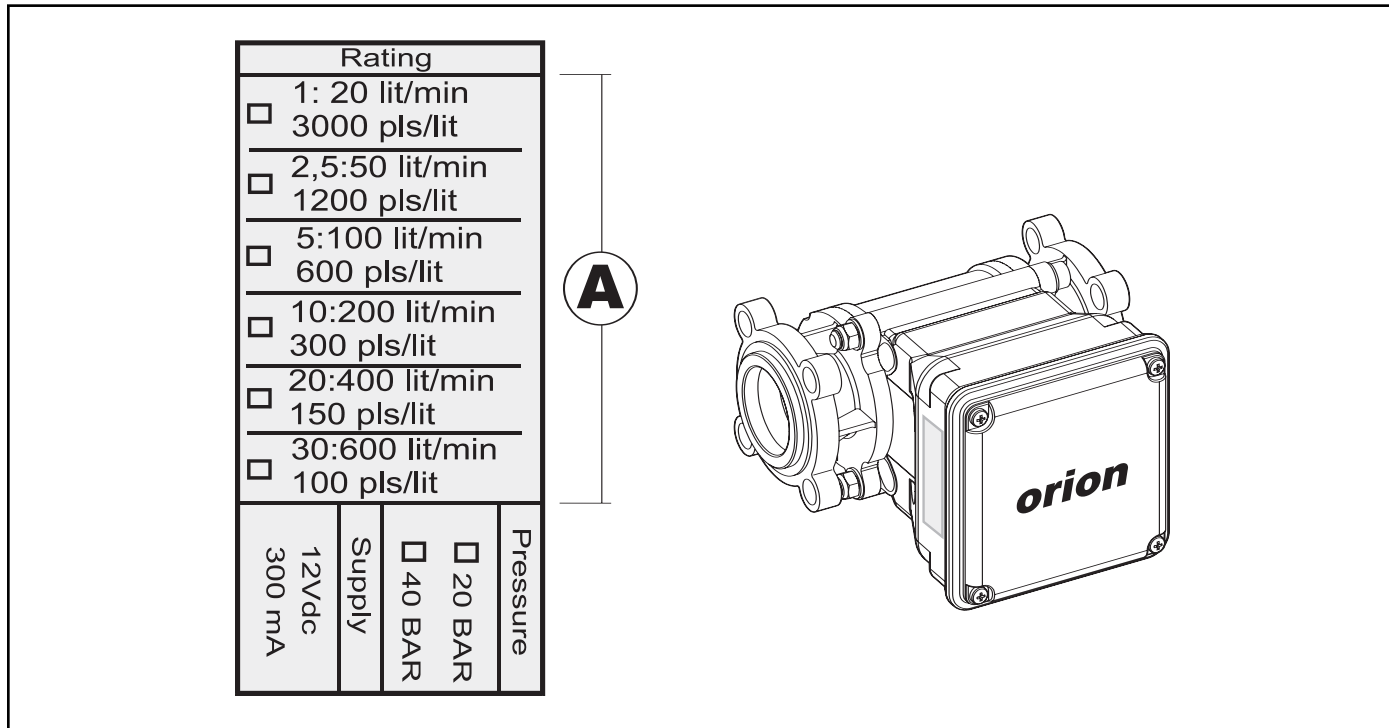


- Use inlet and outlet plumbing of the same diameter as the internal passages of the flowmeter. For further information, see the technical data table on page 6.
- Avoid elbows or restrictions of the piping near the flowmeter.

## Calibration Required

Set the **flowmeter constant** value (A) on the computer connected to Orion. This value is given on the plate A on the flowmeter (Fig. 4) and on the **technical data** table on page 6. For further information regarding how to set the constant, consult the use and maintenance manual of the computer being used.

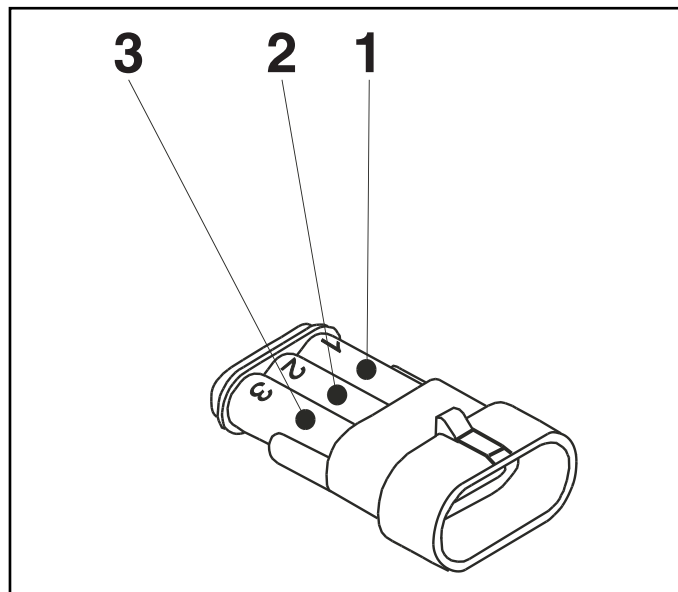
**Fig. 4**



## Electrical Connections

The Orion flowmeter has been designed to be connected to ARAG devices (computers, screens, displays), but can also be connected to equipment made by other manufacturers as long as they are designed for flowmeters of this style. See page 5 for adapter cables to other systems. See Fig. 5 for electric connections supplied with Orion flowmeter.

**Fig. 5**



Electrical Connections		
Color	Connecting	Pos.
Blue	GND	1
Brown	+12VDC	2
Yellow-Green	Signal	3

## Adapter Cables for Orion



**Orion Adapter Male**

**AE2650**

**Raven Adapter™ Male**

Position	Connection
1	ground
2	+12 volts
3	signal

Position	Connection
2 o'clock	ground
10 o'clock	+12 volts
6 o'clock	signal



**Orion Adapter Male**

**AE2651**

**TeeJet Adapter™ Male**

Position	Connection
1	ground
2	+12 volts
3	signal

Position	Connection
C	ground
A	+12 volts
B	signal



**Orion Adapter Male**

**AE2652**

**John Deere Adapter Male**

Position	Connection
1	ground
2	+12 volts
3	signal

Position	Connection
C	ground
A	+12 volts
B	signal



**Orion Adapter Male**

**AE2654**

**Midtech Adapter™ Female**

Position	Connection
1	ground
2	+12 volts
3	signal

Position	Connection
C	ground
A	+12 volts
B	signal

## Maintenance

- To keep the flowmeter in good condition, run clean water through the plumbing at the end of each treatment operation.
- At the end of each season or in case of malfunction, clean thoroughly.
- Do not use metal or abrasive objects for cleaning the line.
- Do not use solvents or petroleum-based products for cleaning the external parts of the container.

## Technical Data Table

Model Number	Capacity		Max. Pressure		Recommended Plumbing	Internal Passages mm	Pulses/US Gal	
	l/min	US gpm	bar	psi			pls/l	pls/gal
Part Number								
4621BA11313	1-20	0.3-5	20	290	3/4"	7	3000	11355
4621BA21313	2.5-50	0.6-13	20	290	3/4"	10	1200	4542
4621BA31414	5-100	1.3-26	20	290	1"	14	600	2271
4621BA33434	5-100	1.3-26	40	580	1"	14	600	2271
4621BA41414	10-200	2.6-53	20	290	1"	18, 5	300	1135
4621BA41515	10-200	2.6-53	20	290	1-1/4"	18, 5	300	1135
4622BA51616	20-400	5-106	20	290	1-1/2"	28	150	568
4622BA57616	20-400	5-106	20	290	1-1/2"	28	150	568
4622BA61616	30-600	8-158	20	290	1-1/2"	28	100	378
4622BA61717	30-600	8-158	20	290	2"	28	100	378

**Material:** Nylon and Polypropylene

**Supply:** 11 - 14,5

**Max. Absorption:** 300 mA

**Minimum conductivity of liquid:** 300  $\mu$ S/cm

**Max. Pressure for Altri/Others:** 290 PSI

## Notes

## Limited Warranty on Hypro Products

Hypro Corporation ("Hypro") warrants to the original purchaser of its products (the "Purchaser") that such products will be free from defects in material and workmanship under normal use for the period of one (1) year for all Arag controls, which includes all consoles, wiring, manual and electrical valves. "Normal use" does not include use in excess of recommended maximum speeds, pressures, vacuums and temperatures, or use requiring handling of fluids not compatible with component materials, as noted in Hypro product catalogs, technical literature, and instructions. This warranty does not cover freight damage, freezing damage, normal wear and tear, or damage caused by misapplication, fault, negligence, alterations, or repair that affects the performance or reliability of the product.

**THIS WARRANTY IS EXCLUSIVE. HYPRO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

Hypro's obligation under this warranty is, at Hypro's option, to either repair or replace the product upon return of the entire product to the Hypro factory in accordance with the return procedures set forth below. **THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.**

**IN NO EVENT SHALL HYPRO BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR OTHERWISE.**

### Return Procedures

All products *must* be flushed of any chemical (ref. OSHA Section 0910.1200 (d)(e)(f)(g)(h)) and hazardous chemicals *must* be labeled before being shipped\* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data sheet from the Purchaser for any pump or product Hypro deems necessary. Hypro reserves the right to "disposition as scrap" pumps or products returned which contain unknown substances, or to charge for any and all costs incurred for chemical testing and proper disposal of components containing unknown substances. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown substances.

For technical or application assistance, call the **Hypro Technical/Application number: 1-800-445-8360.**  
**To obtain service or warranty assistance, call the Hypro Service and Warranty number: 1-800-468-3428;**  
**or call the Hypro Service and Warranty FAX: (651) 766-6618.**

Be prepared to give Hypro full details of the problem, including the following information:

1. Model number and the date and from whom you purchased your product.
2. A brief description of the product problem.

Hypro may request additional information, and may require a sketch to illustrate the problem. Contact the factory to receive a return material authorization before sending the product. All products returned for warranty work should be sent shipping charges prepaid to:

HYPRO CORPORATION  
Attention: Service Department  
375 Fifth Avenue NW  
New Brighton, Minnesota 55112-3288

\* Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

