

ARAG® Electromagnetic Visual-Flow Flowmeter Operating Instructions and Parts Manual

Description

The ARAG 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.



Electromagnetic Visual 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 for installation on agricultural machinery (crop sprayers) and for industrial applications. The flowmeter must never be used to measure the passage of hydrocarbons, or 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 3.

WARNING!

- Do not wash with high pressure.
- Comply with the specified power supply voltage (12 Volt DC).

- 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 3. Outside these limits, the flowmeter will not be accurate.

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

Installation

1. Install the flowmeter as shown.
2. Comply with the connections between connector and wiring shown in Fig. 2
3. Use inlet and outlet plumbing having the same diameter as the passages inside the flowmeter.

Fig. 1

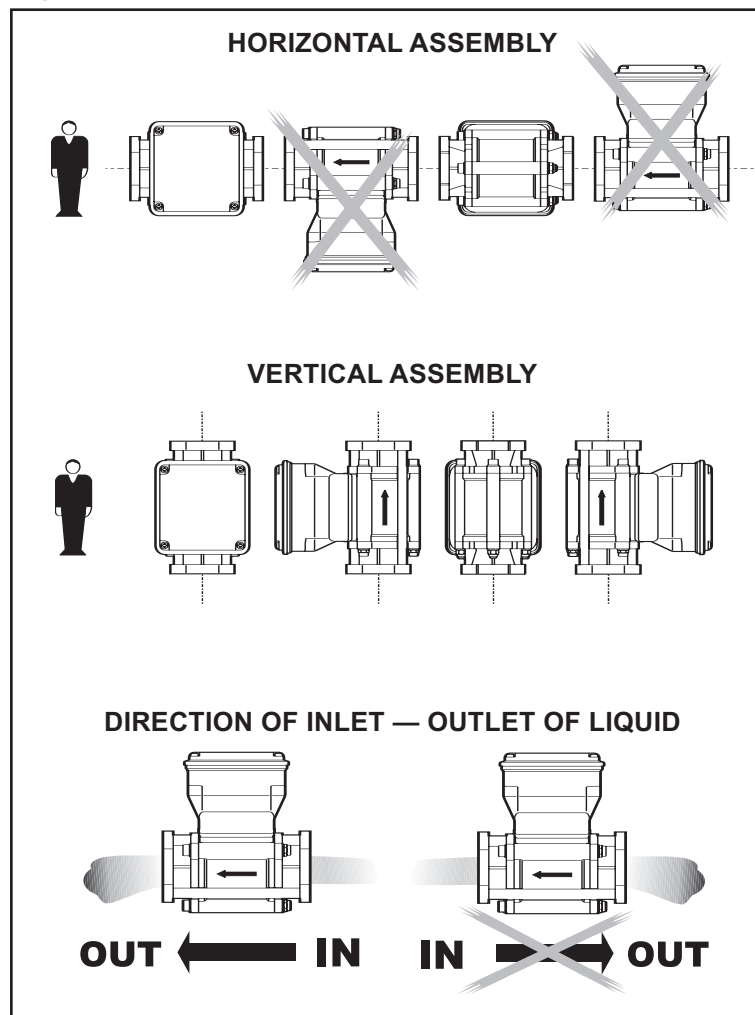
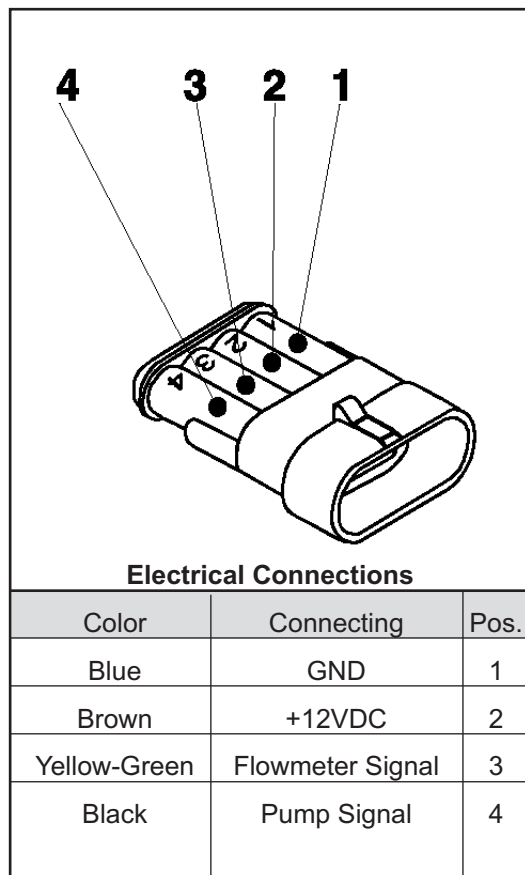


Fig. 2



Technical Data Table

This flowmeter is only able to detect the passage of conductive liquids, and specifically of liquids having conductivity of 300 $\mu\text{S/cm}$ as indicated in the table in Fig. A (pg. 5). Use the flowmeter only within the flow-rate limits stated in the Technical Data Table 1. The flowmeter will not be accurate outside this range.

TABLE 1

Model Number	Capacity		Max. Pressure		Recommended Plumbing	Internal Passages	Pulses/US Gal	
	l/min	US gpm	bar	psi		mm	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 $\mu\text{S/cm}$ Max. Pressure for Altri/Others: 290 PSI								

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.

Preliminary Settings

Visual-flow flowmeters are equipped with a software which allows the user to choose the mode of use (control of filling pump or flow-rate display device) and the unit of measurement in which all data are to be displayed (Liters/min. or U.S.Gallon/min.). See next page for detailed instructions.



Fig. 3
Options menu access
message



Fig. 4
Choosing mode
of use




Fig. 5
Changing the unit of
measurement



Fig. 6
Modifying the parame-
ter



Fig. 7
Saving the parameter

To modify the mode or the unit of measurement when the device is switched on, keep the  key pressed until the display (shown in Fig. 3) appears.

Method of use

Press one of the keys until the display shown in Fig. 4 appears, alternating with the value at which it is set. If the setting is not as required, keep both keys pressed until the display (shown in Fig. 6) appears, to access to the value modification function.

Press one of the two keys to change the operating mode:

MODE 0 --> Filling flowmeter (set only if used together with the pump stop module code 4622BA50000-200)

MODE 1 --> Flow-rate display device

Confirm the selection by keeping both keys pressed until the display (shown in fig. 7) appears.

Unit of measurement

Press either key until the display (shown in Fig. 5) appears, alternating with the value at which it is set. If the setting is not as required, keep both keys pressed until the display (shown in Fig. 6) appears, to access the function for changing the unit of measurement.

Press one of the two keys to change the unit of measurement:

EU --> European units of measurement (Liters and Liters/min.)

US --> United States units of measurement (U.S.Gallon and gpm)

Confirm the selection by keeping both keys pressed until the display (shown in Fig. 7) appears. All the data displayed during use of the device will be in the unit of measurement set.

Menu exit

To exit from the initial settings mode, switch off the power supply to the Digiblock.

Switch-on

At switch-on, after performing a display test, the device displays the following information:


- Software release
- Unit of measurement
- Indicator of the value displayed



Programming

The value of the **flowmeter constant** is indicated on the **nameplate** applied to the flowmeter and in the **Technical Data** table.

Flowmeter Constant

To modify this parameter, keep both keys pressed until the display in Fig. 6 is shown and then the currently set value of the constant:

- to increase the value, press  (keep it pressed to increase the value quickly);

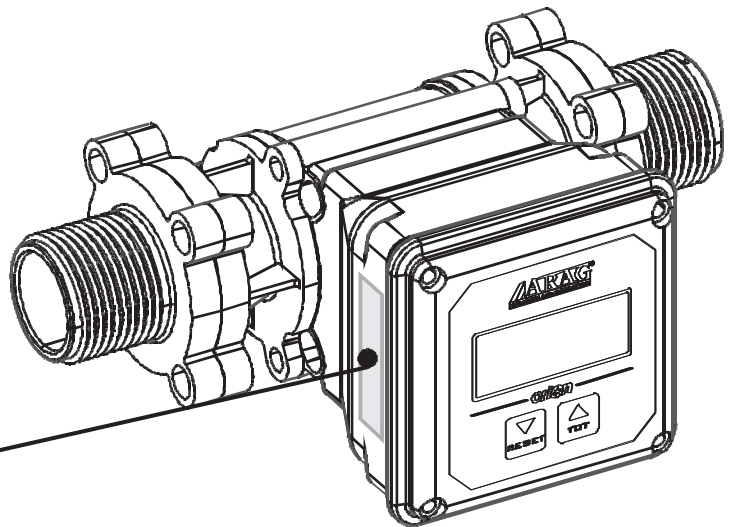
 to decrease the value, press  (keep it pressed to decrease the value quickly).

Confirm the value entered by keeping both keys pressed until the display shown in Fig. 7 appears. **If no key is pressed for ten seconds during modification of the flowmeter constant, the device automatically exits from the programming mode, retaining the last value saved in the memory.**

Technical Data

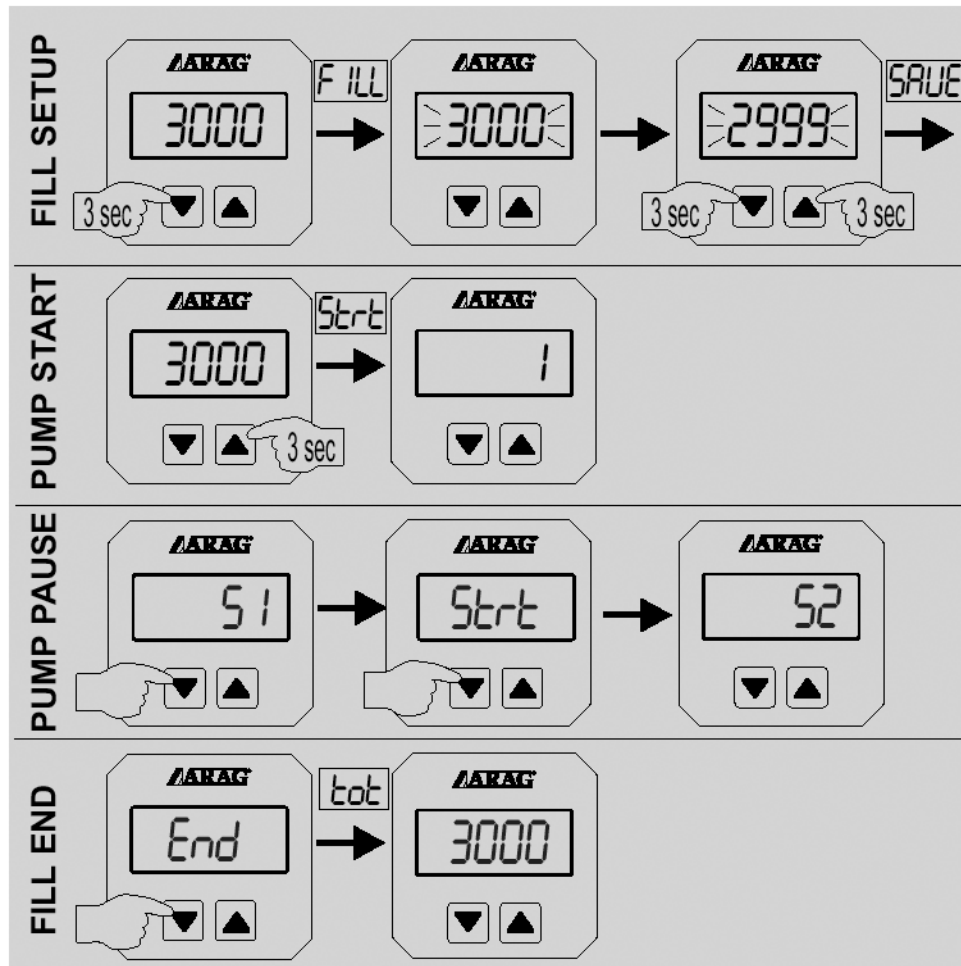
Fig. A

Rating			
<input type="checkbox"/>	1: 20 lit/min	3000 pls/lit	
<input type="checkbox"/>	2,5:50 lit/min	1200 pls/lit	
<input type="checkbox"/>	5:100 lit/min	600 pls/lit	
<input type="checkbox"/>	10:200 lit/min	300 pls/lit	
<input type="checkbox"/>	20:400 lit/min	150 pls/lit	
<input type="checkbox"/>	30:600 lit/min	100 pls/lit	
		Supply	Pressure
		<input type="checkbox"/> 12Vdc	<input type="checkbox"/> 20 BAR
		<input type="checkbox"/> 300 mA	<input type="checkbox"/> 40 BAR



Filling Flowmeter Operating Mode (Mode 0)

Quick Instructions for Visual-Flow, Mode: FILL



Filling Flowmeter Operating Mode (Mode 0) Continued

Step-by-Step Instructions for Visual-Flow, Mode: FILL



Fig. 8
Display of amount of liquid to be filled



Fig. 9
Modify amount of liquid to be filled




Fig. 10
Start of filling procedure



Fig. 11
End of filling procedure

After the switch-on procedure has been carried out, the device shows the display (shown in Fig.8) and then the amount of liquid loaded in the tank at the last fill-up.


To set a new amount for filling (in Liters or U.S.Gallons), keep the  key pressed until the display shown in fig. 9 appears, followed by the last filling operation carried out.


- To increase the value, press  (keep it pressed to increase the value quickly);

- To decrease the value, press  (keep it pressed to decrease the value quickly).

Confirm the value entered by keeping both keys pressed until the display (shown in Fig. 8) appears. **If no key is pressed for ten seconds during modification of the amount of liquid to be pumped into the tank, the device automatically exits, retaining the last value saved in the memory.**

To start filling the tank, keep the  key pressed until the display (shown in Fig. 10) appears. As soon as the key is released, the device shows the gradual passage of the liquid into the tank.

Pressing the  key during filling provides display of the flowmeter's instantaneous flow rate (in Liters/min or gpm).

If the  key is pressed, filling is temporarily interrupted. It can be restarted by pressing the same key again.

Keeping both keys pressed ( and ) will end the filling procedure before the preset value is reached.

N.B. : With this command, it is not possible to restart the filling operation from the point where it was interrupted. Once filling is complete, the display (shown in Fig. 11) starts to flash. Return to display of the total amount of liquid delivered to the

Flow-Rate Display Operating Mode (Mode 1)



Fig. 12

European units of measurement


After the switch-on procedure is carried out, the device displays the unit of measurement set and then the value corresponding to the instantaneous flow rate.

Instantaneous flow rate: This is the value which indicates the flow rate (Liters/min. or GPM) measured by the flowmeter. This value is preceded by the display (shown in Fig. 12) for European units of measurement or the display (in Fig. 13) for United States units of measurement.



Fig. 13

United States units of measurement

Press the  key to access display of the total amount of liquid delivered.

Total amount of liquid delivered: This represents the total amount of liquid (Liters or U.S.Gallons) measured by the flowmeter since the last time the counter was reset. This value is preceded by the display shown in Fig. 8.



Fig. 14

Reset

Press the  key to return to display of the instantaneous flow rate.

To **reset the value**, which the counter contains, access display of the total

amount of liquid delivered and keep the  key pressed until the display in Fig. 14 is shown. If the counter reaches the full scale value (9999 Liters or U.S. Gallons), the device shows the display (in Fig. 15) and the counter has to be reset.

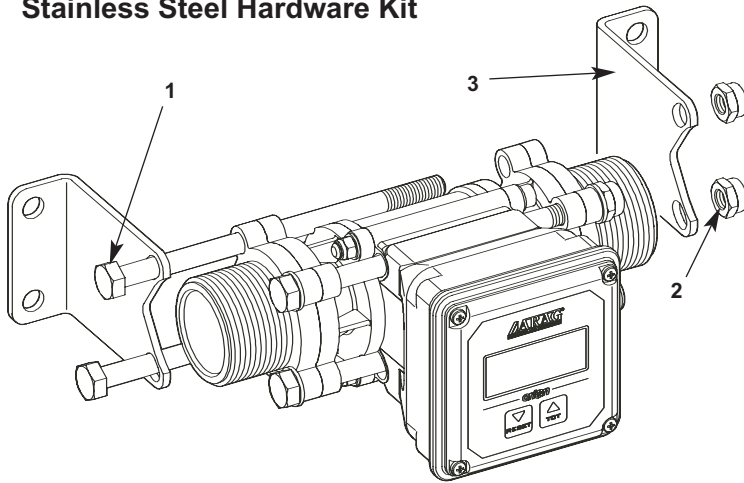


Fig. 15

Full Scale

Accessories

Stainless Steel Hardware Kit



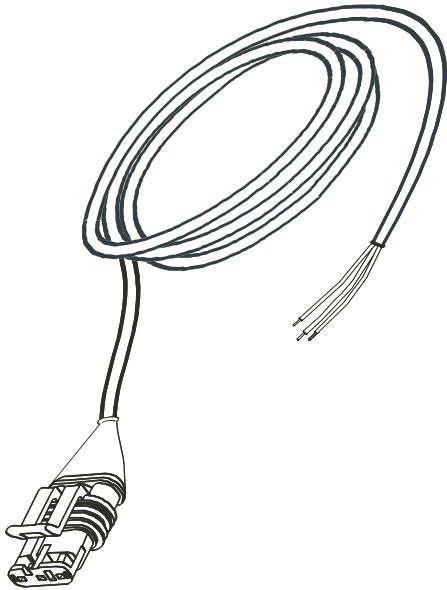
Assembly Kit V1M258-FM

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D
1		Bolt	4
2		Nut	4
*		Washer	4
*		O-Ring	2

* Not shown.

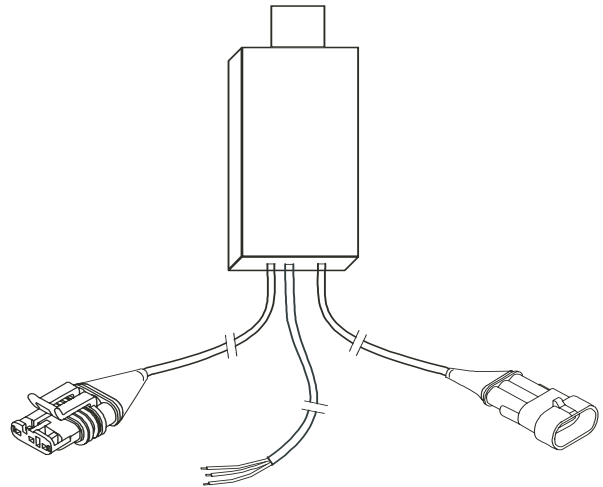
- 3 Part Number 463911-100, SS Bracket, must be ordered separately.

4-wire End Cable



CODE	LENGTH
4622BA50000-100	118"

Filling Pump Stop Module



CODE
4622BA50000-200

– NOTES –

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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.



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