

TANK FILLING SYSTEM

CE

462F2XXX

Software rel. 2.x.x

INSTALLATION, USE AND MAINTENANCE



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DECLARATION OF CONFORMITY	

This manual is an integral part of the equipment to which it refers and must accompany the equipment in case of sale or change of ownership. Keep it for any future reference; ARAG reserves the right to modify product specifications and instructions at any moment and without notice.

MANUAL USE MODES

THE INSTALLATION MUST BE CARRIED OUT BY AUTHORIZED AND SKILLED PERSONNEL ONLY. ARAG IS NOT RESPONSIBLE FOR ANY INSTALLATION CARRIED OUT BY UNAUTHORIZED OR UNSKILLED PERSONNEL.

• **RESPONSIBILITY**

It is the responsibility of the installer to perform the installation "in a workmanlike manner" in order to ensure proper operation of the system. ARAG recommends using its components to install control systems.

The installer will be held responsible for any malfunction if he decides to use other brands' components even without actually changing the system parts or harness.

The compatibility check with components and accessories of other manufacturers shall be carried out by the installer.

If the ARAG components installed together with other brands' components get damaged, no direct or indirect warranty will be provided.

INTENDED USE

Device designed to work on agricultural machinery for spraying and crop spraying applications. The machine is designed and built in compliance with ISO 14982 standard (Electromagnetic compatibility - Forestry and farming machines), harmonized with 2014/30/EU Directive.

Product description

The movable tank filling system measures and displays on its screen a pre-established quantity of fluid and stops filling when the set quantity is reached. Through electromagnetic measurement, the tank filling system (which features no moving mechanical parts) emits a signal that is proportional to the flow of fluid passing through it. The flowmeter displays the relevant flowrate, which is calculated according to the impulses generated and the value of the flowmeter constant previously set.

USE LIMITS

M The tank filling system can NOT be used:

- for the measurement of gases, vapors, or the like;
- in the presence of explosive atmospheres;
- in contact with liquids for human consumption;
- for use in the non-professional market.

RISKS AND PROTECTIONS

The installation works must be done with battery disconnected using suitable tools and any personal protection equipment deemed necessary.

PRECAUTIONS

- · Do not aim water jets at the equipment.
- · Do not use solvents or fuel to clean the case outer surface.
- Do not clean equipment with direct water jets.
- · Comply with the specified power voltage (12 Vdc).
- In case of voltaic arc welding, remove connectors from the device and disconnect the power cables.
- Only use ARAG genuine spare parts and accessories.
- Use the tank filling system only within recommended flowrate range indicated in the technical data sheets. Outside this range, the tank filling system may provide incorrect data, thus misleading the operator or the automatic system.



PACKAGE CONTENT



The package includes: Transportable tank filling system with threaded coupling

The package does not include: Power supply

2 INSTALLATION

The tank filling system must be connected by means of suitable fittings (2" F threaded fitting with hose tail) to a pump, which will supply the liquid to be poured into the tank.

Install the tank filling system at least 20 cm from the elements that could cause turbulence inside the pipe (valves, bends, constrictions, etc.).

WARNING:

- Rest the tank filling system on a horizontal surface

- The system to which it is connected must have a filtering element with a filter of at least 50 mesh, together with a safety valve to limit use pressure at the specified max. value.

WARNING:

/ľ

ARAG is not liable for any damage to the system, persons, animals or property caused by the use of material different from the one indicated.

Failure to observe the above instructions with consequent damage to the tank filling system will automatically void the warranty.

2.1 Recommended layout





2.3 Hydraulic connections

Avoid bottlenecks or twists before the fittings and on pipes.

Do not use the tank filling system at pressure values higher than the ones indicated in the technical specifications.

For the connections, use pipes and fittings duly dimensioned for the system operating pressure.

WARNING: For the implementation on already operating systems, it is necessary to follow all safety rules described herein. System assembly and start-up must be carried out by expert personnel according to the safety rules so as to ensure the same safety level of the system.

Connect inlet pipes to the valve and outlet pipes to the flowmeter using suitable connectors. Take special care, where requested, to insert the supplied O-ring correctly (threaded ends). If, for any reason, the pipes leak at connection points, apply unsintered PTFE tape to improve sealing.

2.4 Wiring connections

The tank filling system must be connected using the supplied cables.



WARNING: CHECK THAT THE CONNECTOR IS FITTED CORRECTLY TO ENSURE A PROPER SEALING. If the gasket is not positioned correctly, there may be infiltrations of water in the connector and in the valve, with the consequent risk of damage to the device.

2.4.1 Power supply connection

Connect the power supply connector to the relevant counterpart (not supplied) as shown in Fig. 6.



Fig. 6

WARNING:

To avoid short circuits, do not connect the power cables to battery before the installation is completed. Before powering up the filling system, make sure the battery voltage is as specified (12 Vdc).

 \mathcal{M} If the filling systems remain on for a long time with the machine off, the tractor battery could run flat: in case of prolonged stops \mathcal{O} of the machine with engine off, make sure the computer is off, too.

The power source must be connected as indicated in Fig. 7:



VARNING:
The power circuit shall ALWAYS be protected by a 10 A fuse like the ones for automotive applications.

• To avoid short-circuits, connect the power cable connector only after completing installation.

2.4.2 Connector A connections

Position	Connection		
1	GND		
2	+12 Vdc		
3	Signal (square wave)	-	
4	Valve control signal		

2.4.3 Connector B connections

Position	Connection		
1	GND		
2	-		
3	Signal (square wave)	-	

2.4.4 Connector C connections

Position	on Connection	
1	GND	
2	+12 Vdc	
3	Valve control signal	

3 PROGRAMMING

Tests and checks before setting

Before setup, check:

Using the keys

- that all components are correctly installed;
- the correct connection to the power source;
- the component connection.

Failure to correctly connect system components or to use specified components might damage the device or its components.

3.1



Fig. 10

- After changing a parameter within the Advanced Menu "aPL", to return to the Main Menu power the device off and then back on.

- While changing the value of a parameter or when you are in a menu other than the Main Menu and no key is pressed within 10 sec, the display automatically returns to the Main Menu.

- When changing a numeric value, prolonged pressing of the key causes the value to change quickly.

3.2 Preliminary setup for use - Advanced Menu "oPL"



When installing the flowmeter in the filling system, some settings are required to display filling data correctly: • Operating mode

- Units of measurem.
- Valve actuation time

To access the Advanced Menu, keep the key pressed **while turning on** the device until the message " $_{a}P_{b}$ " appears on the display.

3.2.1 "oPL" menu structure

	Menu	Default	Min	Мах	Other values that can be set / Notes
3.2.1.1	ΠοσΕ	0			1 - 2
3.2.1.2	Ьг	Ч	۵	10	
3.2.1.3	ЬLЯL	oFF			00
3.2.1.4	ЬL	Grn			YELL - NRGE - CY∂∩ - bLuE - oFF - RLL
3.2.1.5	UAL	0.0	0.0	20.0	
3.2.1.6	uni E	Eu			υ5

3.2.1.1 Function *RodE*

It is possible to set 3 different operating modes:

- MODE 0 = Tank filling count with valve control command (0 ÷ 9999 EU: I [default setting] US: gal)
- **MODE 1** = Flowrate display
- MODE 2 = Tank filling count with valve control command (0 ÷ 999.9 EU: I US: gal).



1) Press a few times to display the active operating mode; the value alternates with the message "TodE".

2) To change the figure, hold down the keys simultaneously until the message "5EL" appears on the display.3) Press a few times to select the mode you want to use.

4) To confirm the setting, hold down the keys simultaneously until the message "5RUE" appears on the display. The set operating mode is displayed alternately with the message " f_{adE} ".

3.2.1.2 Function br

It allows adjusting the display brightness. Values range from 0 to 10. The default value is 4.

3.2.1.3 Function *bLRL*

It allows the display to be illuminated in red when the error alarm is activated. The default value is OFF.



3.2.1.4 Function *bL*

It allows choosing the display backlighting color. The following table shows the available colors:

Color	Display item
Yellow	YELL
Magenta	NRGE
Cyan	[Yan
Green (DEFAULT)	Grn
Blue	ьίυΕ
No color	oFF
White	RLL

3.2.1.5 *"URL*" valve actuation time

This parameter allows setting the time that the valve installed on the system takes to complete the closing operation; by setting this data, the flowmeter will be able to anticipate the exact moment at which to start the closing operation, preventing more product from entering when the set value is reached.

URL = 0 ÷ 20 s.



1) Press in succession to display the "URL" valve actuation time.

2) To change the figure, hold down the keys simultaneously until the message "5EL" appears on the display.

3) Set the actuation time value by using the **TDT** (increase) and **RESET** (decrease) keys; prolonged pressing of the keys allows quick change of the value.

4) To confirm the setting, hold down the keys simultaneously until the message "5RUE" appears on the display. The set actuation time is displayed alternately with the message "URL".

3.2.1.6 Units of measurement "נחן ב"

You can choose the units of measurement in which to display the data:

EU = Europe (I - I/min) [default setting].

US = USA (gal - gpm).



1) Press a few times to display the active type of unit of measurement; the value alternates with the message "unit b".

2) To change the figure, hold down the keys simultaneously until the message "SEL" appears on the display.

3) Press to select the type of unit of measurement to use.

4) To confirm the setting, hold down the keys simultaneously until the message "5RUE" appears on the display.

The set unit of measurement is displayed alternately with the message "unit L".

3.3 Preliminary settings for use - Access to programming menu "Lo5L"





The data in the image are indicative, always refer to the values on the label applied to your model.

PRELIMINARY SETUP FOR USE / PROGRAMMING

3.3.1 Flowmeter constant setting



USE

While the system is in use, the flowmeter sends pulses to the computer, which, based on the previously set constant value, will indicate the instant flowrate.

An LED on the connector housing indicates the status of the device (Fig. 12):



My The electromagnetic flowmeter can only detect the passage of conductive liquids with conductivity equal to or higher than 50 μS/cm.

- Do not place the equipment under pressurized water.
- Comply with the specified power voltage (12 Vdc).

- If arc welding is needed, make sure that the flowmeter power supply is disconnected; if necessary disconnect power cables.

- Use the flowmeter only within the flowrate limits indicated in the label applied to the body.

Outside this range, the flowmeter may provide incorrect data, thus misleading the operator or the automatic system.

ARAG can not be held responsible for any damage caused to persons, animals or things from the incorrect or unintended use of the flowmeter or its parts.

4.1 Use of Mode 0 - Mode 2

4.1.1 Display of data

The following parameters can be displayed during operation:

Total liquid filled in the tank	0 ÷ 9999 (EU: I - US: gal) - "Mode 0"	
	0 ÷ 999.9 (EU: I - US: gal) - "Mode 2"	
Instant flowrate	0 ÷ 999.9 (EU: I/min - US: gpm)	

4.1.2 Setting the amount of liquid to be filled in the tank

In this operating mode, the flowmeter displays the total amount of liquid to be filled in the tank:



After switching on, the display shows the value of the amount of liquid to be filled in the tank; to change it, proceed as follows:

1) Press the **RESET** key until the message "FILL" is displayed.

2) Set the quantity of liquid to be filled in the tank by using the **TDT** (increase) and **RESET** (decrease) keys; prolonged pressing of the keys allows quick change of the value.

3) To confirm the setting, hold down the keys simultaneously until the message "SRUE" appears on the display.

4) The set amount of liquid to be filled in the tank is displayed preceded by the message "ToT".

4.1.3 Operation of Mode 0 - Mode 2



1) After start-up the amount of fluid to be poured into the tank is displayed.

2) To start the filling procedure, keep TDT key pressed until the message "52rb" appears; the value corresponding to the total amount of fluid poured into the tank is displayed in real time.

3) By pressing the **TDT** key the instant flowrate value of the fluid poured into the tank is displayed, preceded by "LIL" (or "LRL"). By pressing the key again, the display goes back to indicating the quantity of fluid poured into the tank.

4) Once the set value has been reached, the message "End" is displayed, alternated with the total quantity of fluid poured into the tank.

If the Pump Stop Module is present, the filling device will stop automatically; otherwise, it must be stopped manually.

5) To end the tank filling, press the **RESET** key: the display will return to the beginning of the filling procedure, showing the amount of liquid to be filled in the tank preceded by the message "Lat".

4.1.4 Interruption/stop before reaching the programmed quantity



1) During the filling procedure, pressing the **RESET** key can momentarily stop the pump (*); the message "5LrL" is shown on the display. However, if you are displaying the instant flowrate, the message "5LrL" is not displayed: to display it, press the **TDT** key. 2) To resume filling, press the **RESET** key again.

3) To finish filling before the programmed threshold is reached, hold down the keys simultaneously until the "End" message is displayed.

4) At this point, the filling procedure is finished; the display returns to show the value of the programmed amount of liquid.

(*) Filling can be started or stopped automatically only if the flowmeter is connected to the ARAG Pump Stop Module. Otherwise, the flowmeter is unable to start or stop the pump and will function only as a display.

4.2 Use of Mode 1

4.2.1 Data display



After power on, the display shows the measured parameters for **Total liquid filled in the tank** and **Instant flowrate** using the previously selected units (EU / US):

- Total liquid filled in the tank = 0.00 ÷ 9999 (EU: I US: gal).
- Instant flowrate = 0.0 ÷ 999.9 (EU: I/min US: gpm).

4.2.2 Resetting the counter of the liquid filled in the tank



1) Access the display of the total liquid filled in the tank (4.1.2).

2) To reset the total amount of liquid filled in the tank to zero, press and hold the **RESET** key until the message "r 5L" is displayed.

3) At this point, the display will show the message "TDT" followed by the total quantity counter reset to zero.

4.3 Reaching full scale



1) The display will show this screen when the full-scale value (9999 I - gal) is reached, and it is then necessary to reset the totalizer to zero.

2) To reset the count of the amount of liquid filled in the tank to zero, press and hold the **RESET** key until the message "r 5L" is displayed.

5 MAINTENANCE / DIAGNOSTICS / REPAIRS

- 5.1 Precautions for maintenance operations and for cleaning the external parts
 - DISCONNECT THE POWER CABLES.
 - WEAR SUITABLE PERSONAL PROTECTION EQUIPMENT, OVERALLS, GLOVES AND FACE MASK.
 - DO NOT CARRY OUT ANY OPERATION ON THE SYSTEM IF INDOORS OR IN POORLY VENTILATED AREAS.
 - DO NOT USE SOLVENTS OR FUEL TO CLEAN THE OUTER SURFACE.
 - DO NOT USE AGGRESSIVE DETERGENTS OR PRODUCTS.
 - DO NOT USE PRESSURIZED WATER JETS (PRESSURE WASHERS, ETC.).

5.2 Cleaning rules

- Clean only with a soft wet cloth.
- Do NOT use aggressive detergents or products.
- At the end of each spraying, let clean water flow inside the pipe.
- Do not use metal or abrasive objects to clean the pipe.

5.3 Error messages

During operation, in case the following error codes are shown, follow the instructions in the table below:

MESSAGE ON DISPLAY	PROBLEM	SOLUTION
E-05	Short circuit or too high absorption on the valve control output	Check the efficiency of the filling flowmeterCheck the connection between the flowmeter and the valve

5.4 Troubleshooting

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PROBLEM	CAUSE	SOLUTION	
The valve leaks or the seal of the ball	Presence of foreign bodies	Make sure there are no foreign bodies; if so, remove them.	
is not enough	Worn seals	Contact the nearest Service Center.	
The valve does not work	Lack of power	• Check the connections, the cable and the controls. Replace the cable. If the problem persists, contact your nearest Service Center.	
	Geared motor broken	Replace the geared motor.	
The valve does not stop at the preset point	Malfunction of gearmotor microswitches	Contact the nearest service center.	
The flowmeter does not read any value	No power supply	Check the harness of the flowmeter.	
The value read by the flowmeter is not linear or stable	Presence of turbulence or air in the circuit	Check the circuit.	
	Wrong setup	Check the programming related to the displayed data.	
The flowmeter shows wrong data	Sensor fault	Contract the nearest Service Conter	
	Flowmeter-related problems	• Contact the hearest Service Center.	
The flowmeter shows the message	The full scale value has been reached	• Reset the display by following the procedure described in the section related to the displayed datum ("Reaching full scale" on page 14).	

6 TECHNICAL DATA

ELECTRICAL FEATURES

•	Power supply voltage	11 ÷ 14.5 Vdc
•	Maximum absorption	3.3 A
•	Liquid minimum conductivity	50 µS/cm
•	Valve activation time	2.3 s.
El	NVIRONMENTAL FEATURES	
•	Operating temperature	0 °C \div 60 °C / +32 °F \div +140 °F
•	Storage temperature	-20 °C ÷ 60 °C / -4 °F ÷ +140 °F
Pł	HYSICAL FEATURES	
•	Size	375x210x346 mm / 14.8"x8.3"x13.6"
•	Weight (without cables)	4100g / 145 oz.
M	ATERIALS	
•	External body (electromagnetic flowmeter and valve)	Nylon®
•	Flanges (electromagnetic flowmeter)	Nylon® / Brass
•	Inner tube (electromagnetic flowmeter)	TEFLON® / PPVF
•	Support for transport	Fe360

TECHNICAL FEATURES

- Flowrate
- Maximum operating pressure

Specific values can be retrieved from the label on the body of the electromagnetic flowmeter.

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7 GUARANTEE TERMS

1. ARAG s.r.l. guarantees this apparatus for a period of 360 days (1 year) from the date of sale to the client user (date of the goods delivery note).

The components of the apparatus, that in the unappealable opinion of ARAG are faulty due to an original defect in the material or production process, will be repaired or replaced free of charge at the nearest Assistance Center operating at the moment the request for intervention is made.

The following costs are excluded:

- disassembly and reassembly of the apparatus from the original system;
- transport of the apparatus to the Assistance Center.
- 2. The following are not covered by the guarantee:
- damage caused by transport (scratches, dents and similar);
- damage due to incorrect installation or to faults originating from insufficient or inadequate characteristics of the electrical system, or to alterations resulting from environmental, climatic or other conditions;
- damage due to the use of unsuitable chemical products, for spraying, watering, crop sprayer or any other crop treatment, that may damage the apparatus;
- malfunctioning caused by negligence, mishandling, lack of know how, repairs or modifications carried out by unauthorized personnel;
- incorrect installation and regulation;
- damage or malfunction caused by the lack of ordinary maintenance, such as cleaning of filters, nozzles, etc.;
- anything that can be considered to be normal wear and tear.
- Repairing the apparatus will be carried out within time limits compatible with the organizational needs of the Assistance Center. No guarantee conditions will be recognized for those units or components that have not been previously washed and cleaned to remove residue of the products used;
- 4. Repairs carried out under guarantee are guaranteed for one year (360 days) from the replacement or repair date.

 ARAG will not recognize any further expressed or intended guarantees, apart from those listed here. No representative or retailer is authorized to take on any other responsibility relative to ARAG products. The period of the guarantees recognized by law, including the commercial guarantees and allowances for special purposes are limited, in length of time, to the validities given here. In no case will ARAG recognize loss of profits, either direct, indirect, special or subsequent to any damage.

- 6. The parts replaced under guarantee remain the property of ARAG.
- 7. All safety information present in the sales documents regarding limits in use, performance and product characteristics must be transferred to the end user as a responsibility of the purchaser.
- 8. Any controversy must be presented to the Reggio Emilia Law Court.

8 END-OF-LIFE DISPOSAL

INFORMATION TO USERS OF PROFESSIONAL EQUIPMENT

Pursuant to Art.26 of Italian Legislative Decree 49 of 2014, "Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)



The crossed-out wheeled bin symbol on the equipment or on its packaging indicates that the product must be collected separately from other waste to allow proper treatment and recycling at the end of its useful life.

Appropriate separate collection for subsequent recycling, treatment and environmentally compatible disposal of the scrapped equipment helps to avoid possible negative effects on the environment and health, and promotes the reuse and/or recycling of the materials that make up the equipment.

Unauthorized disposal of the product by the user results in the application of the sanctions provided for by current legislation.

ARAG S.r.I. - WEEE identification no.: IT11080000007284 - has chosen to join a Collective System that guarantees the correct treatment and recovery of WEEE and the promotion of policies for environmental protection.

9 DECLARATION OF CONFORMITY

The declaration of conformity is available at the website www.aragnet.com, in the relevant section.

Only use genuine ARAG accessories or spare parts to make sure manufacturer guaranteed safety conditions are maintained in time. Always refer to the Internet address www.aragnet.com



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