RFS-6–GP

Manual for use and maintenance

RFS-6 GP

Poultry Feed Control

Ag/MIS/UmGB-2516-02/18 Rev 1.0

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RFS-6-GP

Manual for use and maintenance

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This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation.

This document is destined for the user of the apparatus: it may not be reproduced in whole or in part, committed to computer memory as a file or delivered to third parties without the prior authorization of the assembler of the system.

Munters reserves the right to effect modifications to the apparatus in accordance with technical and legal developments.

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1 Introduction

1.1 Disclaimer

Munters reserves the right to make alterations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing an RFS-6!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the fan, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters Controllers.

1.3 Notes

Date of release: July 2010

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

1 Precautions

- Grounding
- Checking the Battery Level

1.1 Grounding

- Keep the controller as far as possible from heavy contactor boxes and other sources of electrical interference.
- Do not connect communication wire shields, which go from one house to another at both ends. Connect them at one end only. Connection at both ends can cause ground loop currents to flow, which reduce reliability.
- The COM connection for communications is not the shield wire. The COM, RX and TX wires must connect to each other at all controllers.

1.2 Checking the Battery Level

- Check the battery once a year. The output must be 2.7 volts (minimum). Authorized personnel only must replace the battery if the output is below the minimum required level or every five years.

2 Introduction to the RFS-6 GP

The Munters **RFS-6 GP** is a precision broiler feed control system that enables the grower to:

- control feed delivery precisely
- weigh feed deliveries

Feed delivery can be set to preset times for meal time feeding, continuous full feeding, or restricted feeding. The following sections describe:

- Display
- Accessing the Menu
- Keypad Keys
- Hot Keys
- Main Menu

2.1 Display

The **RFS-6 GP** normally displays the time and feed delivered on this date. When there is an **alarm** the screen alternately displays the alarm message and the standard display. Refer to Figure 1 and Figure 2.

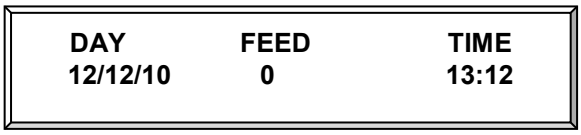

Figure 1: Standard Display View

Figure 2: Sample Error Message

The following are the alarms that can appear on the screen:

- Weigh Container Fail
- Weigh Cont. Overflow
- Auger In Overtime
- Low Feed in Bin
- Emptying Failure (weighing container is not empty)

2.2 Accessing the Menu

- Press **Menu** to view the Control Menu.
- Use the arrow keys to access the menu items.

2.3 Keypad Keys

The RFS-6 GP keypad consists of eight keys, and is described in Table 1.

Table 1: RFS-6 GP Keypad Keys Description

Menu	Use this key to access and exit the menus
Enter	Selects or moves the **RFS-6 GP** into menu items, or confirms editing changes.
+ (Plus)	Increments values. The rate at which values increase changes as the keys are depressed. You can increase values by holding the + key and depressing (or holding) on one of the arrow keys. Every arrow has its own factor which multiplies the addition to the value.
- (Minus)	Decrements values. The rate at which values decrease changes as the keys are depressed. You can decrease values by holding the - key and depressing (or holding) on one of the arrow keys. Every arrow has its own factor which multiplies the addition to the value.
◄ (Left)	Moves to the left in all the screens and tables. When there are several entries on a screen, the cursor alone may move. Whenever necessary, the entire screen moves. Multiplies x 10.
▲ (Up)	Moves up menus and tables. Multiplies x 100.
► (Right)	Moves to the right in all the screens and tables. When there are several entries on a screen, the cursor alone may move. Whenever necessary, the entire screen moves. Multiplies x 1000 (1K).
▼ (Down)	Moves down menus and tables. Multiplies x 10,000 (10K).

NOTE The RFS-6 GP does not accept changes until you confirm them by pressing Enter.

2.4 Hot Keys

Press Enter and one of the following keys:

- 10K: Software version
- 10: Relay status
- 100: Silo weight
- 1K: Feed cycle process and the weighing container weight

2.5 Main Menu

The following charts detail the RFS-6 GP menu structure.

CONTROL	MANAGEMENT	HISTORY	TEST	CALIBRATION
Feeding Time	Time/Date	Feed Consumption	Relays	Feed Scale
Operation Mode	Alarm Reset	Alarms	Feed Scale	Feed Factor
System Parameters	Alarm Time	Clear History	Digital Inputs	
	Silo Weight			

3 Control Menu

The Control menu describes feed time periods and stopping/resuming of the feed function. The Control Menu includes:

- Feed Time
- Operation Mode
- System Parameters

3.1 Feed Time

You can schedule feeding times and quantities five times daily. The time programmed is the beginning and end of each meal. The feeding time table operates the feeder and auger relays.

Figure 3: Feed Time Screen 1

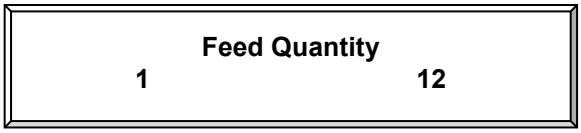

Figure 4: Feed Time Screen 2

- Key
  - #: The feeding period, from 1 to 5.
  - From Time: Beginning of feeding time. Enter the required time.
  - To Time: End of feeding time. Enter the required time.
  - Feed Quantity: Quantity of feed to be distributed, in kilograms. Enter the required quantity.

3.2 Operation Mode

The operation mode controls the filling process. There are three modes:

- AUTO: The load cell continually weighs the weighing container and allows filling as needed.
- BYPASS: Filling of the container is by time (for example 5 kilograms per minute). Use this option only if the load cell is not working. RFS-6 GP automatically calibrates itself at 0:00 AM, so there is no need to calibrate the quantity.
- STOP: Stops the filling process.

3.3 System Parameters

Table 2 lists the RFS-6 GP parameters. A brief description and their default values follow the table.

Table 2: RFS-6 GP Parameters

Variable Number	Description
1.	Maximum Portion 0...60 [Kg / Lb]
2.	Max Auger Time 0...60 [minutes]
3.	Not Empty Time 0...1000 [minutes]
4.	Silo Low 0...65000 [Kg / Lb]
5.	Feed/Minute 0 . . . 6500 [Kg]
6.	House No. 0
7.	Baud rate 1200, 2400, 4800, or 9600
8.	Stop Differential Weight (kg). 0 – 8 Kg
9.	Optimizer Default Slow and Fast
10.	Valve Close Time (seconds). 0 . . .30 seconds

RFS-6 GP parameter details:

- **Maximum**: Maximum weight for one portion, for a manual scale. Default 25 Kg
- **Maximum Auger Time**: Waiting time before the alarm starts in case the weighing container has not been filled with feed (Alarm Code 5 or 4). Default 5 minutes
- **Not Empty Time**: Waiting time before the alarm starts in case the auger is not empty and still contains more than ¾ (75%) a portion (Alarm 6). Default 180 minutes
- **Silo Low**: If the remaining quantity of feed in Silo 1 is below the low limit, Alarm 7 is triggered. Default 0
- **Feed / Minute**: In a bypass situation, the feed quantity that passes through Auger 1 in one minute (measured during regular work). Default 0.0
- **House No.**: This is the house number, used when communicating with the RFS-6 GP. Default 0
- **Baud Rate**: Communication rate between the PC and the RFS-6 GP. Default: 9600
- **Stop Differential Weight**: The amount of feed which flows into the weighing container from the moment the auger turns off. For example, if the bin's maximum capacity is 50 kilograms and the stop differential weight is 5 kilograms, RFS-6 GP closes the auger when the load cells registers 45 kilograms. Default 3 kilograms.
- **Optimizer**: The Optimizer enables accurate weightings of the weighing container. The slower the weighing, the more accurate the result.
- **Valve Close time**: This parameter is the time required for the valve to close. Default 7 seconds.

4 Management

Management menus control:

- Time & Date
- Alarm Reset
- Alarm Time
- Silo Weight

4.1 Time & Date

The **RFS-6 GP** keeps time in military, 24 hour format. In case of a power outage, the internal battery maintains the correct time and date for up to three years. The date format is dd/mm/yy.

Figure 5: Time Screen

Use the arrow keys to move between the time and date screens.

4.2 Alarm Reset

Alarm Reset enables disabling the alarm relay for current alarms. This conveniently silences the alarm bell while you work on the alarm issue. When a new alarm occurs, or the alarm reoccurs, the **RFS-6 GP** generates a new alarm. This function has three options:

- **No**: No reset occurs.
- **Ack**: This option turns off the siren, but the alarms keep flowing
- **Yes**: To use this option, first repair the problem, and then select Yes. The announcement stop.

Use the arrow keys to move between the reset options.

4.3 Alarm Time

The **RFS-6 GP** enables a window time for the various alarms. The alarms do not register other than in the programmed times. You can disable all alarms during sleeping hours. Possible RFS-6 GP alarm codes:

- Scale Failure (Feed Scale)
- Weigh Tank Overflow
- Auger Time Overrun
- Weigh tank not empty
- Silo Empty

4.4 Silo Weight

This screen displays the amount of grain currently in the silo. You can add to this amount to reflect the amount added in a delivery.

Figure 6: Silo Weight Screen

5 History

The History Menu includes the following functions

- Feed Consumption
- Alarms
- Clear History

5.1 Feed Consumption

The RFS-6 GP maintains a complete daily feed consumption record for the entire flock throughout the growth period. You can view the data with this menu item, which displays the following data:

- **Daily**: Amount consumed during the current day
- **Total**: Cumulative amount consumed
- **Date**: Current date

Figure 7: Feed Consumption Screen

NOTE Use the left and right arrows to view the data.

5.2 Alarms

The **RFS-6 GP** maintains a record of the last 20 alarms. This item displays the date, time and alarm code for each of these alarms. The most recent alarms are listed first.

The following are the alarms:

- Weigh Cont. Fail
- Container Overflow
- Auger In Overtime
- Low Feed in Bin
- Emptying Failure

Figure 8: Alarms Screen

Use the up and down arrow keys to view the alarms.

5.3 Clear History

This function erases the alarm history.

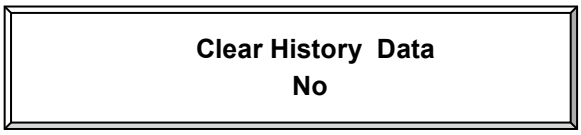

Figure 9: Clear History Data Screen

Use the + / – keys to select Yes or No.

6 Test

Test mode enables you to test various system controls and actions.

This section details the following tests:

- Relays
- Feed Scale
- Digital Inputs

6.1 Relays

This option manually controls each relay.

Figure 10: Relay Test Screen

To manually control each relay:

1. Use the left and right directional arrow keys (or the Enter key) to move the cursor to the desired relay number you wish to change.
2. Use the **+** / **–** keys to turn the relay on or off.

NOTE The RFS-6 GP does not operate automatically while in the Relay Test mode.

- A: auger
- V: valve
- F: feeder
- Al: alarm

6.2 Feed Scale

The Scales menu item displays the internal machine numbers for the present feed scale readings. If you know the weight at two points, you can calculate the conversion factors for the load cells.

Figure 11: Feed Scale Screen

- Disconnected: Scale disconnected
- A2D: Weight

If the feed factor is 0, only the A2D appears

6.3 Digital Inputs

RFS-6 GP has two digital inputs:

- **Intermediate**: Weighing container proximity sensor
- **Hopper**: Hopper proximity sensor

Both stop their respective process. Intermediate stops the filling process and Hopper stops the emptying process.

The display displays '0' for an open input, and '1' for a short to COM point.

Figure 12: Digital Input Screen

To test:

- Short between Hopper and com digital input
- Short between Intermediate 2 and com

7 Calibration

The following sections detail the calibration procedures.

- Feed Scale
- Feed Factor

7.1 Feed Scale

The feed scale periodically requires calibration.

To calibrate the feed scale:

1. When the scale is empty, press **Enter**.
2. Place a known weight on the scale and enter its value.
3. Press **Enter** and a success/failure message appears.

7.2 Feed Factor

Munters factory calibrates each feed scale platform prior to shipment. Instead of using an accurate weight, you can simply enter the calibration number from the scale.

There is also a zero (tare) number for the feed scale that needs to be entered. The tare is the A2D count while the weighing container is empty.

1. While the weighing container is empty, use the Test Feed Scale Interface (refer to Feed Scale, page 15) to view the weighing container A2D count.
2. Go to Feed Tare and press the **Down arrow** key.
3. Copy this number to the Feed Tare Interface.

The feed factor and the zero number are set automatically after a good calibration.

NOTE Every load cell has its own number. Do not use the number from one load cell to calibrate another one.

8 Installation

This section includes information on:

CAUTION *The RFS-6 GP must be installed by an authorized electrician.*

CAUTION *To avoid exposing the RFS-6 GP to harmful gases or high humidity, it is recommended to install the device in the service room.*

CAUTION *Installation Category (Overvoltage Category) III*

CAUTION *The power supply to the controller should be protected by a 5 Amps circuit breaker.*

WARNING! *Disconnect the power to avoid electrical shock and damage.*

- RFS-GP Installation
- Cold Start
- Feed Scale Container Dimensions
- Feed Scale Container Components and Assembly
- Specifications
- Environmental Protection

8.1 RFS-6 GP Installation

To install the RFS-6 GP:

1. Open the **RFS-6 GP** controller enclosure lid by unfastening the two screws on the left-hand side in the front cover. The front cover swings open.

2. Position the required cables through the cable holders at the bottom of the RFS-6 GP controller enclosure. Connect the wires according to the wiring diagrams. Refer to Figure 13.

- The RFS-6 GP must be installed with a RPLP-1 (power line protector) to provide EMI and lightning protection for the unit's power input. In limited cases of very noisy power lines an isolated transformer may be required.
- The RFS-6 GP controller should be installed a proper distance from high power lines and other electrical/mechanical equipment (i.e. Augers power, variable speed, dimmers, etc.) or other noisy units. A distance of at least 0.5 meter distance should be maintained between the RFS-6 GP controller and the noise source.
- As the load cell cable carries mV it must be a shielded cable grounded on the RFS-6 GP side. This cable must also not be close to source of noise such as high power cables, and a distance of at least 0.5 meter distance should be maintained.
- The water pulse should also be a shielded cable grounded on one side, and kept a safe distance from high power cables.

3. Close the **RFS-6 GP** enclosure lid carefully and tightly. Use of RTV silicon or equivalent sealant to seal the cable holders is highly recommended.

4. After initial **RFS-6 GP** installation is completed, operate the **RFS-6 GP** for a test period and check for proper operation.

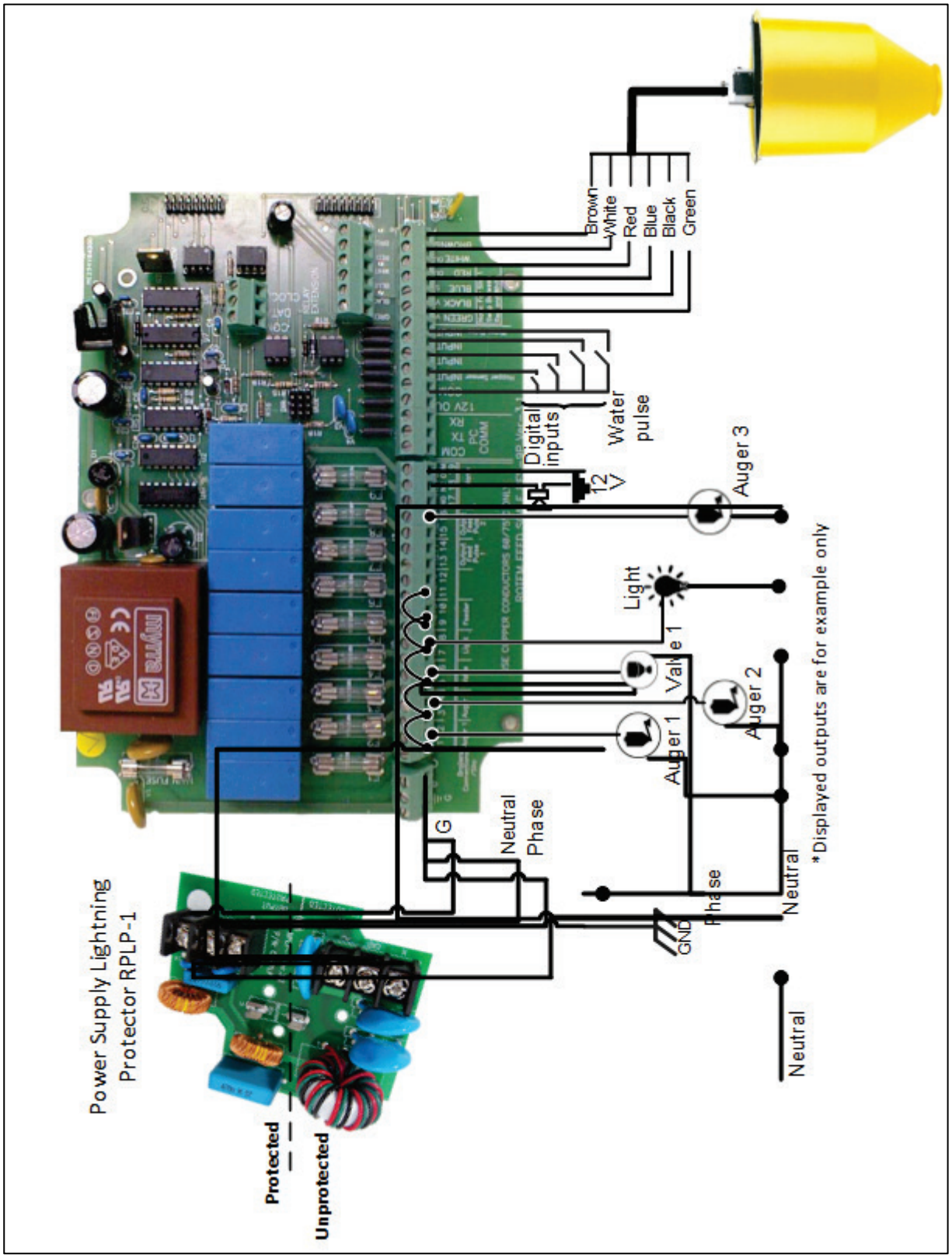

Figure 13: General Wiring Diagram

8.2 Cold Start

A Cold Start returns all the parameter values to the factory default settings and erases the history.

Perform a Cold Start ***only*** after changing a software (EEPROM) in the RFS-6 ***or*** if there is a main issue with the unit.

NOTE It is strongly suggested to create a backup file of all the variables, hidden parameters, tables, and other user programmed variables, so that they can be re-entered after a Cold Start.

NOTE After a Cold Start you must recalibrate the feed and bird scales to retrieve the scale factors, or to enter all factors (include the zero factor for feed scale) manually.

To activate a cold start:

- Simultaneously press the following keys: **Enter**, **MENU**, **+**,**-**, and turn off and on again the device. The message RUN and then COLD appear on the display.

8.3 Feed Scale Container Dimensions

Figure 14 displays the feed scale container components and dimensions.

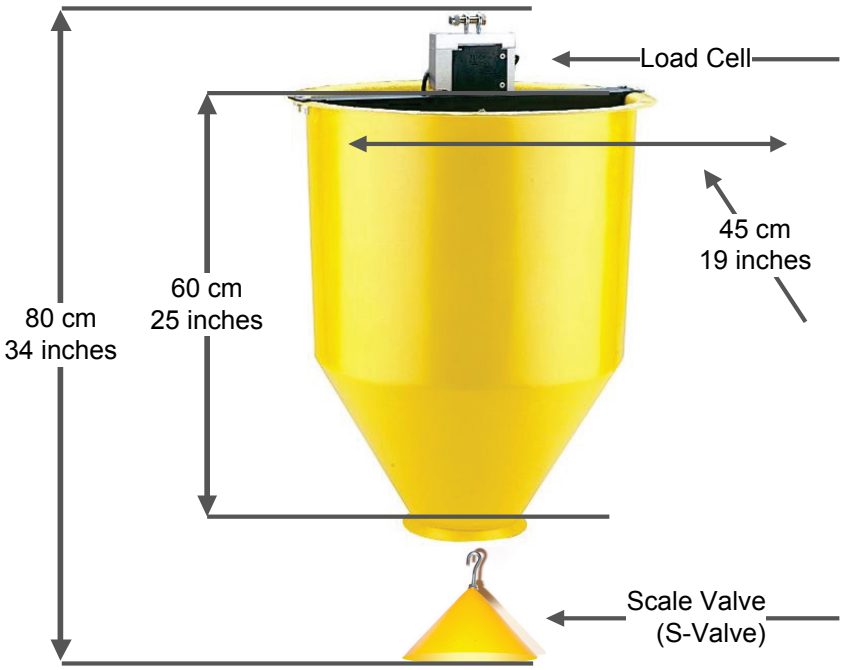

Figure 14: Feed Scale Container Component Dimensions

8.4 Feed Scale Container Components and Assembly

The feed scale container is composed of the following:

- Scale Container
- Valve Motor and Load
- Scale Valve

Refer to Figure 15.

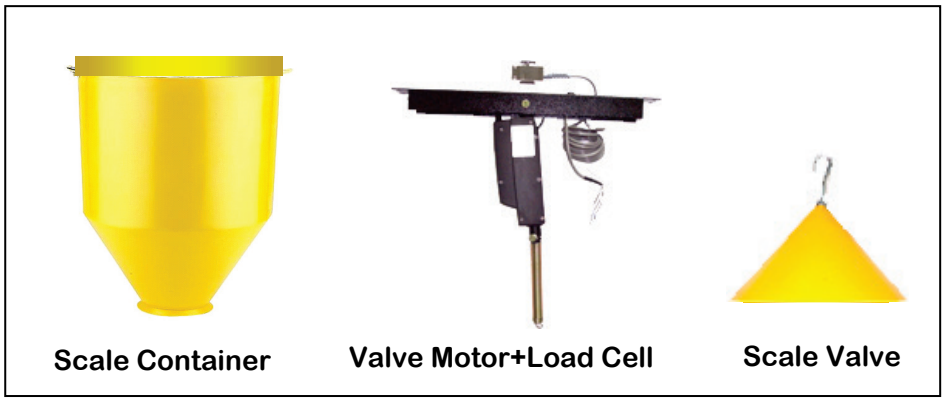

Figure 15: Feed Scale Container Components

Figure 16: Assembled Feed Scale

To assemble the feed scale:

1. Insert the Valve Motor and Load Cell component into the top of the Feed Container and screw it to the container.
2. Insert the Scale Valve component at the bottom of the Scale Container and hook it onto the Valve Motor.

8.5 Specifications

Input Voltage Supply	Single phase 110 VAC (USA and Canada) Single phase 240 VAC (outside the USA and Canada) 0.315 Amps 50 - 60 Hz
Relays Outputs	5 Amps Normally Open (N.O.) Relays
Alarm Output	N.O. and N.C. Pilot Duty
Operating Temperature Range	0*C to 50*C (14*F to 122*F)
Enclosure	Water and dust tight (IP55)
Fuses	Main Fuse: 0.315 Amps Slow Relays Fuse: 5 Amps Slow

8.6 Environmental Protection

Recycle raw materials instead of disposing as waste. The controller, accessories and packaging should be sorted for environmental-friendly recycling. The plastic components are labeled for categorized recycling.

9 Warranty

Warranty and technical assistance

Munters products are designed and built to provide reliable and satisfactory performance but cannot be guaranteed free of faults; although they are reliable products they can develop unforeseeable defects and the user must take this into account and arrange adequate emergency or alarm systems if failure to operate could cause damage to the articles for which the Munters plant was required: if this is not done, the user is fully responsible for the damage which they could suffer.

Munters extends this limited warranty to the first purchaser and guarantees its products to be free from defects originating in manufacture or materials for one year from the date of delivery, provided that suitable transport, storage, installation and maintenance terms are complied with. The warranty does not apply if the products have been repaired without express authorisation from Munters, or repaired in such a way that, in Munters' judgement, their performance and reliability have been impaired, or incorrectly installed, or subjected to improper use. The user accepts total responsibility for incorrect use of the products.

The warranty on products from outside suppliers fitted to RFS-6, (for example, power supplies, cables, etc.) is limited to the conditions stated by the supplier: all claims must be made in writing within eight days of the discovery of the defect and within 12 months of the delivery of the defective product. Munters has thirty days from the date of receipt in which to take action, and has the right to examine the product at the customer's premises or at its own plant (carriage cost to be borne by the customer).

Munters at its sole discretion has the option of replacing or repairing, free of charge, products which it considers defective, and will arrange for their despatch back to the customer carriage paid. In the case of faulty parts of small commercial value which are widely available (such as bolts, etc.) for urgent despatch, where the cost of carriage would exceed the value of the parts, Munters may authorise the customer exclusively to purchase the replacement parts locally; Munters will reimburse the value of the product at its cost price.

Munters will not be liable for costs incurred in demounting the defective part, or the time required to travel to site and the associated travel costs. No agent, employee or dealer is authorised to give any further guarantees or to accept any other liability on Munters' behalf in connection with other Munters products, except in writing with the signature of one of the Company's Managers.

WARNING: In the interests of improving the quality of its products and services, Munters reserves the right at any time and without prior notice to alter the specifications in this manual.

The liability of the manufacturer Munters ceases in the event of:

- dismantling the safety devices;
- use of unauthorised materials;
- inadequate maintenance;
- use of non-original spare parts and accessories.

Barring specific contractual terms, the following are directly at the user's expense:

- preparing installation sites;
- providing an electricity supply (including the protective equipotential bonding (PE) conductor, in accordance with CEI EN 60204-1, paragraph 8.2), for correctly connecting the equipment to the mains electricity supply;
- providing ancillary services appropriate to the requirements of the plant on the basis of the information supplied with regard to installation;
- tools and consumables required for fitting and installation;
- lubricants necessary for commissioning and maintenance.

It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer.

Dismantling and assembly must be performed by qualified technicians and according to the manufacturer's instructions.

The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

Requests for technical assistance and spare parts can be made directly to the nearest Munters office. A full list of contact details can be found on the back page of this manual.

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