CD Series

GRAVIMETRIC DOSERS

USER MANUAL

CE

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1. Introduction

The CD series of Gravimetric Dosers is Sysmetric's solution to raw material dosing for extrusion and injection molding processes. The CD doser reduces material cost, utilizing its high accuracy to lower the amount of expensive additives in the product. The batch weighing nature of the doser offers calibration-free operation and up-to-the-gram accumulation of raw material flowing through the system. The mechanical simplicity of the CD series units, and its practical design, ensures easy maintenance-free operation. The control unit combines automatic adaptive tuning and noise filtering algorithms with the ruggedness, open architecture, and extensibility of an industry-standard PLC.

The CD Series dosing units are divided into 5 models for different capacities:

- CD100 for up to 100Kg/h
- CD400 for up to 400Kg/h
- CD800 for up to 800Kg/h
    - o CD800HD200 for up to 1000Kg/h
    - o CD800HD400 for up to 1200Kg/h

The stated capacities refer to granulated material with 0.5 Liter/Kg density and may vary for different materials.

Note: all of the information about CD800 in this manual also refers to the CD800HD200 and the CD800HD400 models unless otherwise specified.

1.1. Standard Features

- Works with extruders and injection molding machines.
- Vibrational feeders for all but the main channel accommodates most existing raw materials, in granule, powder and regrind forms.
- Highly accurate gravimetric dosing, utilizing automatic adaptive tuning for each ingredient.
- Specifies percentage for each ingredient.
- Special vibrators controller for high accuracy at high throughputs.
- Single Off-center load-cell maintains high accuracy without the need for frequent calibrations.
- Screw type vertical mixer.
- Color touch-screen display for programming and monitoring system operation.
- OMRON host-link interface support enables integration with standard HMI/SCADA (Human machine interface) software.
- Alarms for system failures and hardware malfunctions.
- Monitors total amount of material for each channel.
- Easy system cleanup when changing jobs.
- Material hoppers, channels and mixer are all made of stainless steel.
- All unit parts are easily replaceable.

1.2. Optional

- Vision MES ***Extrusion*** or ***Injection*** PC software for remote system operation, data acquisition and control.
- Recycle channel: In this option channel #2 can be defined as a dedicated recycled channel. See appendix III
- Side Feeder (Recycle Screw): This option is used to feed extrusion machines with continuous edge trimming. See appendix V
- Crate filling: The CD series dosing system can fill crates with a blend of raw materials for the plastic industry See appendix VII

1.3. Hazards

- The Mixer is driven using substantial torque. Never place your hand in the mixer chamber while power is on, it could result in serious injury.
- Plexiglass side covers should be installed and in place at all times prior to starting and while the CD unit is in operation
- The power and the control cabinets contain high voltage electricity. The key to these cabinets should be in the possession of service personnel only.

1.4. Safety Features

The service doors are equipped with safety interlock switches that prevents the mixer motor from running when the door is opened. Do not attempt to bypass this switch.

1.4.1. ABB safety equipment in CD Systems (from 2020)

Sysmetric CD systems use standard ABB safety equipment for the mixer chamber door switches and emergency push buttons. The safety equipment disconnects power to the mixer motor if any of the doors are open.
The end components (i.e. door switches, emergency push buttons) are connected in a ring.

1.4.1.1. Indicator LEDs

All safety components have an indicator LED to show the component's status.

- Green: This component and all other components are working correctly.
- Red: This component is open. i.e. door open, emergency push button pushed.
- Blinking red/green: One of the safety components is open. Look for the component with the red led on.
- Blinking fast red: wiring malfunction or unit malfunction.

1.4.1.2. Safety System Components

Vital: This unit is the heart of the safety system. The LEDs on the unit gives indication for faults or malfunctions. In normal operation all LEDs should be lit.
Eden: This is the mixer door switches, made of two parts (Adam and Eve). Make sure that the two parts are facing each other.
Tina 7A: This unit is used to enable the connection of a standard emergency push button to the ABB safety wiring.

1.5. Safety Symbols

Below are examples of safety symbols and their meanings. Consider those warning where the symbols appear on the system.

1. Caution – consult accompanying documents

2. Caution – risk of electric shock

3. Ground – connect power supply ground wire here

2. System Overview

2.1. Batch Dosing

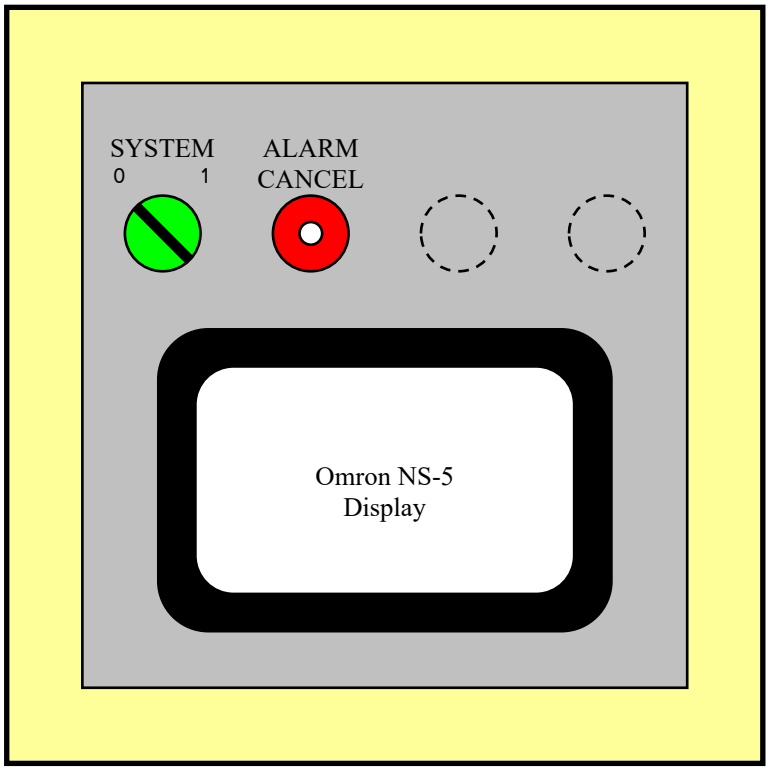
Batch dosing is a method of dosing whereby the system prepares the blend in batches (as opposed to continuous feeding of various kinds). In each batch the ingredients are fed one at a time into a weighing bin according to their percentage in the batch and the batch is then mixed.
Batch dosing offers several advantages over continuous loss-in-weight dosing:

- Single weighing unit, as opposed to multiple weighing units in continuous feeding systems. The multitude of weighing units in continuous feeding systems introduces the need for frequent component calibration. If one of the load-cells loses calibration, it will continuously feed the wrong amount of material, causing damage to product quality or raising material costs without the system ever knowing about it. Some of the higher-end loss-in-weight systems are capable of calibrating themselves, which makes them costlier. The batch system doesn't have this problem at all since one load-cell weighs all ingredients, thus, ensuring accurate proportioning of the ingredients. The single weighing unit approach also lowers the cost of the system.
- The batch system always operates in "closed-loop mode". The weighing unit is continuously weighing and can determine the system's accuracy and correct it as needed. A loss-in-weight system on the other hand has "refill" periods where the feeder switches to the volumetric mode of operation since it can't determine how much material has passed through it.
- The batch system can accurately total the amount of each ingredient that passed through it, to allow automatic reliable inventory and waste control. Loss-in-weight systems can only estimate the total.

The CD doser employs a special kind of batch dosing. The ingredients are divided into a main component and additives. The main component is fed through the "main channel" and the additives are fed through the "additive channels". The main channel uses gravitational feeding and the additive channels are fed using vibrational feeders. The main component is fed first and the actual amount that has been fed serves as the basis for calculating the amounts of the additional components. This method increases the doser's production rate while retaining accuracy.

Note: Although the term "Additive Channels" is used, each of the additive channels can feed the full range 0-100% of the batch. The main channel on the other hand, can be zero, or 20 to 100% of the batch. The reason for this is that the main channel is less accurate than the additive channels.

2.2. Operator Panel



The operator panel contains the following components:

1. *SYSTEM* switch – for activating and stopping the system. **Note:** switching the *SYSTEM* switch to 0 position stops the unit only after it finishes the current batch.
2. System Status Indicator. This indicator is a green lamp located in the *SYSTEM* switch. It has three modes:
    1. Off: The unit is stopped.
    2. On: The unit is waiting for a demand from the processing machine.
    3. Blinking: The unit is preparing a batch.
3. *ALARM CANCEL* push button. This push button has four functions:
    4. Inhibiting unit alarm (R11 potential free contact).
    5. Display and toggle unresolved alarms on the display.
    6. Stopping the unit in the middle of a batch preparation cycle by pressing *ALARM CANCEL* continuously for ten seconds (*SYSTEM* switch should be off).
    7. Holding *ALARM CANCEL* push button pressed for three seconds starts the lamp test whereby all of the lamps turn on and off.
4. Alarm Indicator. This indicator is a red lamp located in the *ALARM CANCEL* push button. It flashes whenever there is an active alarm.
5. Programming/Monitoring display. The display has three major functions:
    8. Monitoring the unit's performance
    9. Entering recipes and operation parameters
    10. Performing maintenance tasks

2.3. System Display

Figure 2.3-1 – System Display

The system display is a color touch-screen panel. Every operation on the display is carried out by pressing gently on the display. Activating a button is carried out be pressing gently on the display where the button appears. Changing numeric values is carried out by pressing gently on the display where the value is written.

2.3.1. Entering Numeric Values

Several screens (e.g. *PROGRAM* screen) have one or more editable numeric items (e.g. the percentage of each component). To modify the value of an item, carry out the following steps:

1. Select the item that you want to edit by pressing gently on the display where the item is shown. A pop-up screen with a numeric keypad will appear on the display.
2. Enter the new value using the numeric keypad. If the item has a decimal point, use the '.' key to move to the fractional part. For example, to enter 12.3, push '1', '2', '.' followed by '3'.
3. Press the *Enter* key to confirm the change. The keypad screen will close and the item will have the new value.

Cancel editing by pressing the *X* button in the keypad screen.

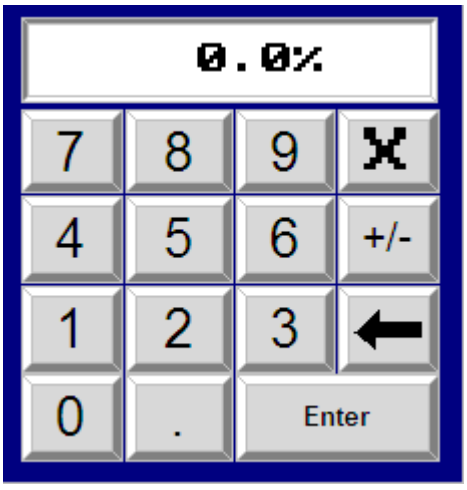


Figure 2.3-2 – Numeric keypad

2.3.2. Main Screen

Pressing the *MAIN* button shows the main screen on the display which is used for monitoring the system. This screen shows the active formula, the actual performance of the system (formula accuracy) and the total amount of material that was dispensed at each channel and by the whole system.

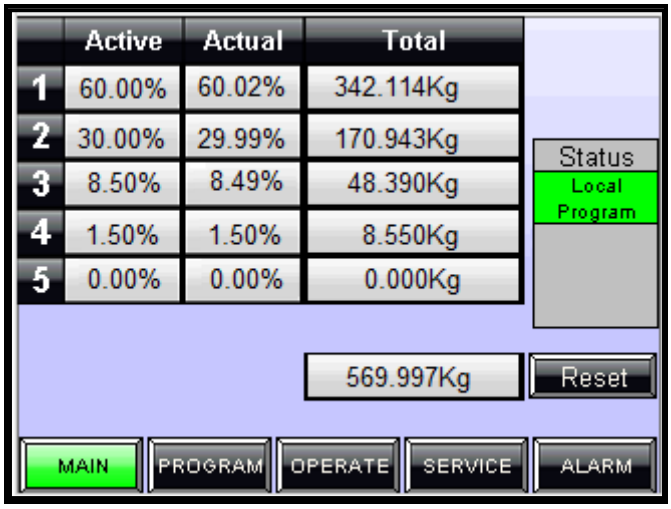


Figure 2.3-3 – Main Screen

The *ACTIVE* column shows the current active formula with the desired percentage of each channel and the *ACTUAL* column shows the actual percentage achieved in the last cycle. Note that, since several batches are mixed together in the mixer, the actual accuracy obtained is better than the one displayed because the errors have a tendency to cancel out.

The *TOTAL* column displays the total amount of material that was dispensed at each channel and by the whole system. The accumulators never reset themselves. Reset them by pressing the *Reset* button on the main screen. Note that the same set of accumulators may be read and reset through the Host Link interface to manage the material consumption of the process machine. If such a setup is used, the accumulators should not be reset from the display. An optional key can be provided to prevent reset of totals via the display.

Note: the number of channels that appear in the main screen (5 channels in the above example) depends on the actual number of channels in the dosing system. The number of channels is determined by the customer.

2.3.3. Program Screen

The *PROGRAM* button is used to display the program screen. In this screen the next formula to be used is entered. The next formula is specified by entering the weight percentage for each channel. If the sum of the new *SET* formula is 100% the *Formula Replace* button will appear enabling replacing the *ACTIVE* formula with the new *SET* formula. If the *Formula Replace* button is pressed when the unit is in the middle of a batch preparation cycle, the new formula will be activated on the start of the next cycle.
Entering values in this screen does not affect the operation of the unit as long as the *Formula Replace* button is not pressed. The new formula will only be active after the *Formula Replace* button is pressed and a new batch is prepared.
Changing the formula may not immediately change the output of the unit because the mixing chamber contains an amount of blended material equal to several batches. It is recommended to clean the mixing chamber prior to any formula change.

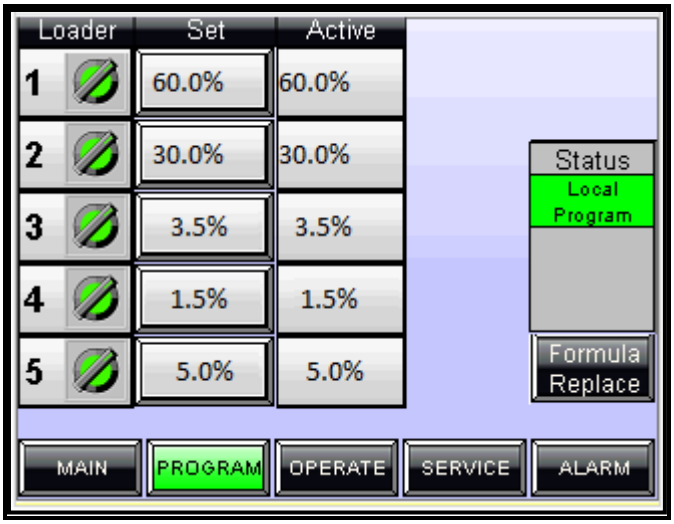


Figure 2.3-4 – Program Screen

Note: the number of channels that appear in the program screen (5 channels in the above example) depends on the actual number of channels in the dosing system. The number of channels is determined by the customer.

2.3.4. Operate Screen

Pressing the *OPERATE* key will switch the display to the operate screen. This screen contains various control buttons for setting the system operation:

1. Default Controls:
   - *Channel #1 Emptying* – manually drains material from the main channel. Holding this button pressed will open channel #1 and will keep it open as long as the button is pressed.
2. Optional Controls (See relevant appendices):
   - *Program Local/Remote* – activating remote PC control. This option is available when the dosing unit is connected to a remote PC and is used to enable formula replacement and totals reset only via the remote PC. (See appendix I)
   - *Machine Conv* – activating hopper loader on the production machine for conveying material from the dosing unit to the production machine. This hopper loader is used when the dosing unit is not installed on top of the production machine. (See appendix II)
   - *Recycled Material* (Channel 2) – available when working with recycled (re-ground) material. Activating this option takes the recycled channel percentage out of the dosing formula. (See appendix III)
   - *Low Level* – preparing batches according to a low level proximity switch. When working at low level mode the system holds one prepared batch at the weighing bin which is dropped down to the mixing chamber according to the low level demand proximity switch (instead of holding the mixing chamber filled with prepared material). This option requires the installation of a low level proximity switch. (See appendix IV)

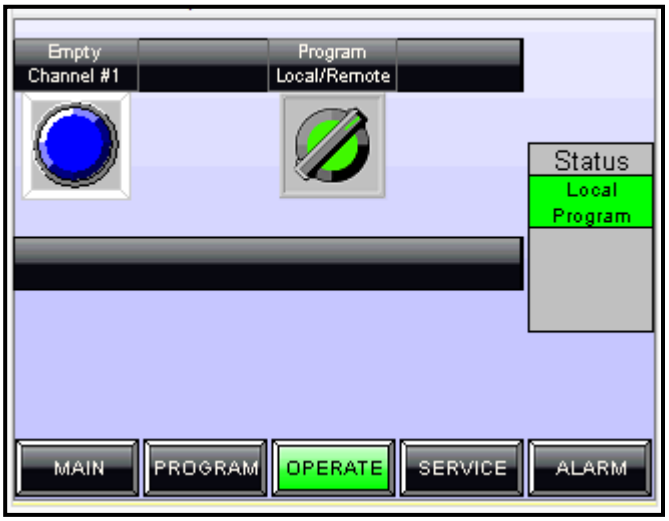


Figure 2.3-5 – Operate Screen

Note: *Machine Conv, Program Local/Remote, Recycled, Low Level* and other optional control switches are available only if specified by the customer.

2.3.5. Service Screen

The *SERVICE* key is used to access the service screen in order to adjust display parameters and access various maintenance screens.
Note: entering the Service screen requires an access code. The default code is 4321.
Display Parameters:

- *Language* – select the interface language.
- *Brightness* – set the screen brightness.
- *Contrast* – set the screen contrast.
- *Time and Date* – set the current time and date (for the alarm log).
- *Imperial/Metric* - select units.

Maintenance Screens:

- *Calibrate* – calibrating and checking the weighing amplifier and load-cell. See 5.1 for details.
- *Vibrators* – manually activating the vibrators in order to tune the vibration level. See 5.2 for details.
- *Parameters* – setting system and batch parameters. See 5.3 for details.
- *Monitor* – view the batch cycle. See 5.4 for details.
- *Vacuum* – activating and monitoring the hopper loaders and vacuum pumps. See 5.5 for details.
- *ETN IP* – edit IP address

Figure 2.3-6 – Service Screen

Note: Vacuum maintenance is available only if the dosing system controls the hopper loader and/or a vacuum pump.

2.4. Main Raw Material Channel

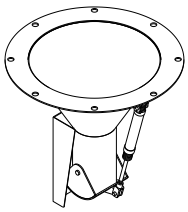
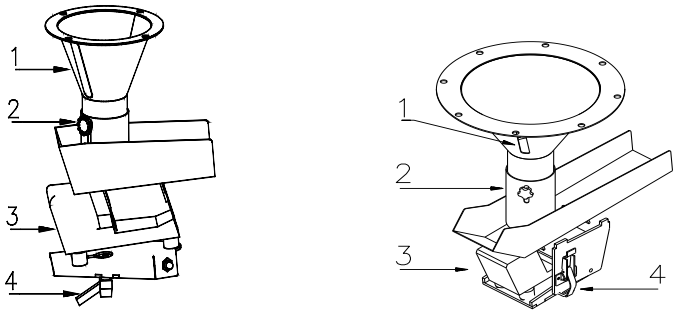


Figure 2.4-1 – Main Channel

The gravitational main channel has a metering gate that is operated by air cylinder. When the cylinder is in the (+) position the metering gate is closed. When the cylinder is in the (-) position the metering gate is open. The cylinder is operated by a pneumatic valve that is mounted on the side of the control cabinet. An indicator shows the metering gate's position.

2.5. Raw Material Vibrational Channels



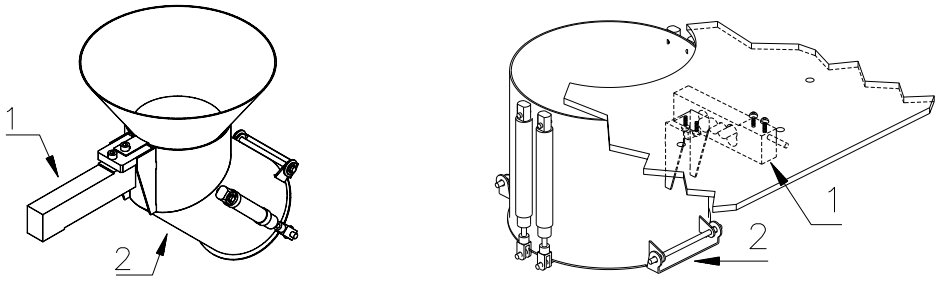
CD100 **CD400/CD800**

Figure 2.5-1 – Vibrational Cannel

1- Material container 2- Adjustable sleeve 3-Vibrational feeder 4- Locking knob

Each channel has an adjustable automatically controlled vibration level. Above the vibrator funnel sits the raw material container that can be filled up using manual or automatic means (usually a hopper loader or venturi-valve-type loader that is mounted on the hopper flange). The container has an adjustable sleeve on its exit that allows better control over the material flow rate.
On CD400 and CD800 units the channel's vibrator can be rotated backwards for easy emptying and cleaning of the container. On CD100 units the vibrator is rotated sideways and a manual activation button is used for draining the container.

2.6. Weighing bin



CD100 **CD400/CD800**

Figure 2.6-1 – Weighing bin

1- Loadcell 2- Weighing bin

ATTENTION!
DO NOT APPLY FORCE ON THE WEIGHING BIN
THE BIN DRAIN DOORS CLOSE ON POWER OFF AND WHEN CALIBRATING

The weighing bin (2) is mounted on an offset-center type loadcell (1). The bin is situated inside the mixing chamber which shields the bin and the loadcell from knocks. The signal from the loadcell is amplified by an electrical circuit that filters out noise and high frequency vibrations. A pneumatic valve controls the weighing bin's doors.

2.7. Mixer

The mixer is a vertical screw operated after each batch preparation for mixing the ingredients. A safety interlock switch disables the mixer rotations when the service door is opened.
There are two types of mixers: positive pressure mixer and negative pressure mixer.

ATTENTION!
ALWAYS TURN THE MAIN SWITCH OFF BEFORE SERVICING THE MIXER
DO NOT BYPASS THE SAFETY INTERLOCK OR SERIOUS INJURIES MAY RESULT

2.7.1. Positive Pressure Mixer

Positive pressure mixer mixes the batch by pushing material downwards at the center of the mixing chamber. The material then flows back upwards up the sides of the chamber. This type of mixer rotates counterclockwise and can work without synchronization with the batch preparations.
The following table details the diameters of positive pressure mixers:

CD100	CD400	CD800
80 mm	105 mm	105 mm

2.7.2. Negative Pressure Mixer

Negative pressure mixer mixes the batch by pulling material upwards at the center of the mixing chamber. The material then flows back downwards at the sides of the chamber. This type of mixer rotates clockwise and usually works for 20-30 seconds after the batch has dropped down to the mixing chamber from the weighing bin.
The following table details the diameters of negative pressure mixers:

CD100	CD400	CD800
150 mm	200 mm	250 mm

2.8. Hopper Flange and Bottom Flange

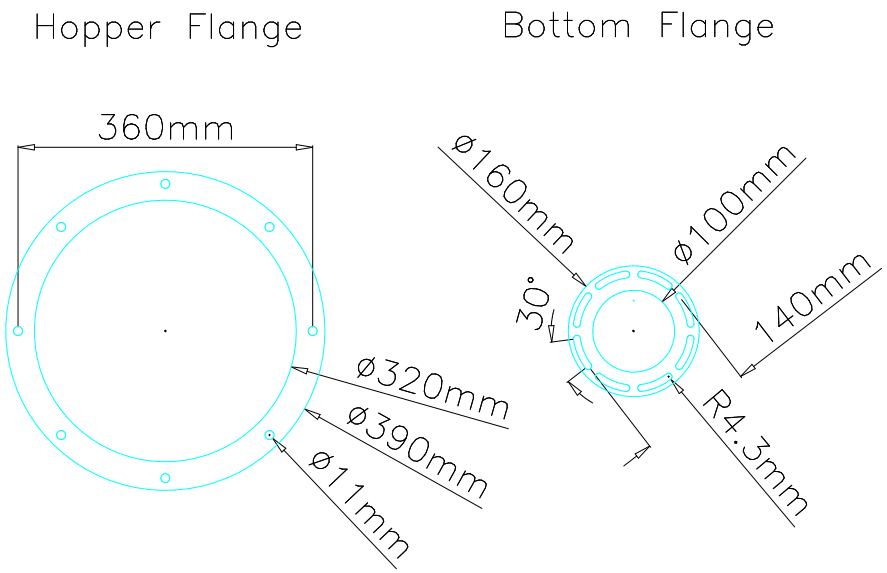


Figure 2.8-1 – Hopper and Bottom Flanges for CD400/CD800

The mixing chamber has a standard bottom flange.

- With floor-mounted units, the flange can be mounted on an optional vacuum-takeoff assembly with a bottom slide-gate for emptying the unit.
- With machine-mounted units, the flange should be bolted to the machine's hole pattern, usually by using an adapter. An optional magnet chamber with a slide-gate, a drainage outlet and a custom-made bottom flange for the machine can be supplied.

2.9. Demand Sensor

The Demand sensor is located in the mixing chamber and its purpose is to trigger a new batch preparation cycle when the material level in the mixing chamber is below the sensor's height. This sensor is a capacitive normally closed (N.C.) proximity switch with an indicator LED and sensitivity tuning screw.

2.10. Power and Control

The power cabinet and the control cabinet of the dosing unit hold the following main parts:

- Programmable Logic Controller (PLC).
- Vibrator controller card – this is a module responsible for activating the vibrators at the desired vibration level. It also has some auxiliary relays for the mixer, and a potential free contact for signaling alarm status.
- Load-cell amplification card.
- Mixer motor contactor and overload protection.

2.11. Normal Operating Sequence

The following is a schematic description of how the unit prepares one batch. Its purpose is to give a general understanding of how the various elements in the unit interact and which factors affect the unit's throughput and accuracy.
Initial condition – bin is open, mixer is stopped and the Demand sensor is covered with material. This means that the last prepared batch is lying unmixed in the mixing chamber above several mixed batches. The new batch preparation cycle starts when the Demand sensor is not covered with material and triggers the following sequence:

1. Demand sensor is not covered. This means, that the entire last prepared batch is inside the mixer and there is no material between the Demand sensor and the weighing bin. The mixer therefore, can start mixing and the bin can close.
2. The mixer starts mixing for a time specified by one of the unit's parameters (usually between 20 and 35 seconds). The following steps occur in parallel with mixer operation:
    a. Bin closes. Unit waits for weight to stabilize.
    b. "Zero weight" level adjusted. Desired percentage for main channel converted to desired weight.
    c. Fast (coarse) flow of main component, until the weight in the bin reaches a certain level and the flap closes. At this stage there's some "in flight" material so that when the weight settles, the bin will presumably contain the desired amount.
    d. The valve of the main channel closes and the system waits for the weight to stabilize.
    e. Based on the actual amount of main component, the control unit computes the desired amounts for the other components.
    f. Fast (coarse) flow of first additive channel, until the amount in the bin is near the desired amount (around 90% of the desired amount).
    g. Slow (fine) flow until desired weight is very near the desired amount.
    h. Vibrator stops, the system waits for all the material to drop into the bin and checks for an "overshoot" or "undershoot" condition. In cases of undershoot, a correction is attempted a few times. If needed, a special tuning algorithm corrects the pre-closing variable and the fast flow to slow flow variable. The corrections will take effect in the next batch. Normally, after inserting a new recipe, it will take 2-3 batches to achieve the best accuracy. If the new recipe doesn't contain any new components then the system will be accurate from the first batch.
    i. Repeat steps f - h for each component.
    j. Wait for mixer to stop mixing (Usually, the mixer has stopped mixing by now).
3. Bin opens, batch falls into the mixing chamber, usually covering the Demand sensor, so the unit returns to the initial condition. If the new batch doesn't cover the sensor, the unit immediately, moves to step 1. Otherwise, the unit will start again when the material level drops below the sensor level.

3. Installation and Check-out

The following is an overview of the steps required to install the unit and check that it is working properly. The description assumes some prior technical knowledge. For more information contact Sysmetric.

3.1. Overview

The unit is configured at the factory ready to start working as soon as it is "unpacked" However, to ensure proper operation, follow the procedures in this section.
The installation and check-out procedure is composed of the following steps:

- Installation. In this step you position the unit in its place and connect the power and air supplies.
- Mixer checkout. Verify that the mixer motor rotates in direction shown on the mixer motor.
- Load-cell checkout. This step ensures that the load-cell hasn't been damaged during shipment.

3.2. Installation

1. Positioning the unit:
   - If the unit is floor-mounted, it comes with two legs attached to the unit's chassis.
   - If the unit is machine-mounted, bolt the unit to the machine (an adapting flange should be supplied - see 2.8).

Note: when choosing the location and the orientation for the unit, make sure that the operator panel and the mixing chamber service doors are not obstructed.

2. CD400/CD800 only – open the service door, the weighing bin is inside the mixing chamber and is not connected to the loadcell to prevent damage to it during shipment. Remove any shipping materials from the weighing bin and mount it to the loadcell using the two bolts on the loadcell. Use a 5mm Allen wrench to fasten the bolts.

Note: for the unit to work properly, the weighing bin must have NO physical contact with anything except for the loadcell on which it is mounted. Make sure that the bin is free. Also verify that the air hoses surrounding the bin don't come in contact with the walls of the mixing chamber.

3. Connect air pressure supply to the unit through the air filter/regulator with at least 6.5Bar. Lubricated air is NOT recommended. At this stage, both the weighing bin doors and the main channel valve should be closed. Adjust the pressure regulator to 6Bar.
4. Make sure that the power *MAIN SWITCH* and the *SYSTEM* switch are both in the OFF position.
5. Connect the unit to the power supply (3 phases 400 – 480 VAC, 50/60Hz):
   - Using a screwdriver, fasten the 3 phase wires to the brown terminal blocks marked *L1*, *L2* and *L3* in the power cabinet of the system and the neutral wire to the blue terminal block marked *N* in the power cabinet
   - Using a ring wrench fasten the ground wire to the screw marked ⏚ on the side of the power cabinet.

ATTENTION!
USE AN EXTERNAL 3 PHASE CIRCUIT BREAKER OF AT LEAST 6AMP AND AN EXTERNAL OVER CURRENT PROTECTION RATED MAXIMUM 6AMP

FOR THE POWER SUPPLY, USE A CABLE OF AT LEAST 1.5mm² (16AWG), RATED FOR AT LEAST 6AMP THAT IS SAFETY APPROVED

MAKE SURE THAT THE GROUND WIRE OF THE POWER SUPPLY CABLE IS COLORED YELLOW/GREEN

AIR PRESSURE: IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE (BY MEANS OF PRESSURE REGULATOR, PRESSURE RELIEF VALVE OR ANY OTHER MEANS) THAT THE AIR SUPPLY PRESSURE WILL NOT EXCEED 10 BAR

6. Turn the *MAIN SWITCH* to *1*. At this stage nothing should happen and all indicators should be off.

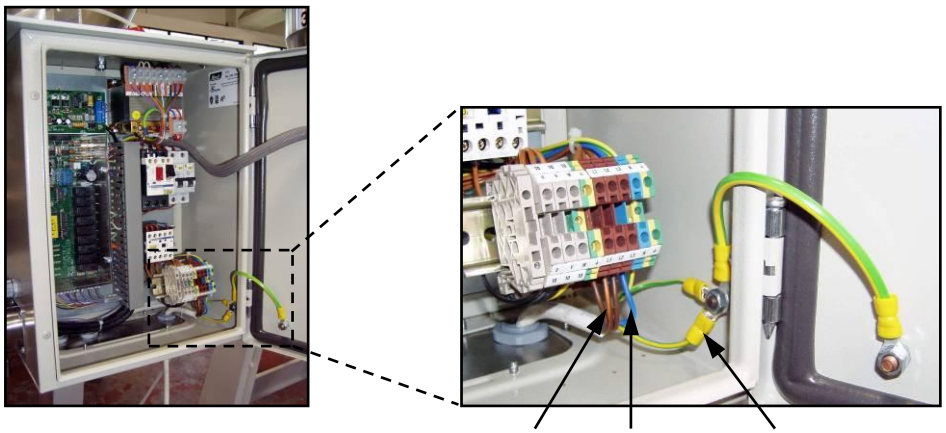


Figure 3.2-1 – Power supply connection

3.3. Mixer Check-Out

Make sure that the mixer's service door is closed and secure. Manually operate the mixer using the contactor in the power cabinet. Make sure that the mixer rotates in the direction pointed to by the arrow on the mixer motor. If the mixer does not rotate at the correct direction switch between 2 of the phases of the power supply. See 2.7 for details on the mixer rotation direction.

ATTENTION!
DO NOT OPERATE THE MIXER WHEN THE SERVICE DOOR IS OPEN

WHEN OPERATING THE MIXER DIRECTLY FROM THE CONTACTOR THE SAFETY INTERLOCK SWITCH IS BYPASSED

3.4. Checking the Load-cell

1. Make sure the *MAIN SWITCH* is on and that the *SYSTEM* switch is off.
2. In the display, press *SERVICE*, enter the access code (4321) and press *Calibrate*. The display should switch to the Calibration screen.
3. The *Mass* field should show 0 (zero). If not, refer to chapter 5.1 “Load-cell Calibration”, to calibrate the unit.
4. Open the service door, and gently press and release the bin. The value of *Mass* should rise and then drop back to zero (plus or minus 2 grams).
5. Gently pull the bin upwards and release it. The value should decrease below zero and then rise back to zero (plus or minus 2 grams).
6. Press the *MAIN* key on the display.

If the weight does not return to its original value, then something is touching the weighing bin or the load-cell. The unit cannot work reliably in this condition.

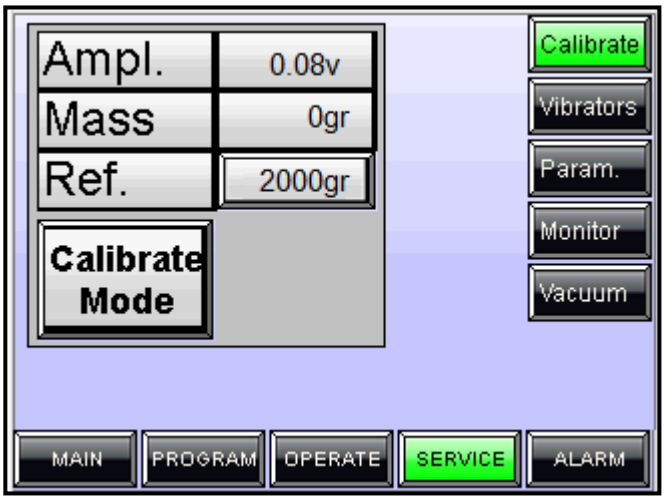


Figure 3.4-1 – Calibration Screen

Note: the steps described here are the first steps in the calibration procedure. For more information and details see 5.1.

4. System Operation

4.1. Starting the Unit

The following procedure is used to start the unit:

1. Make sure that the *SYSTEM* switch is off.
2. Turn *MAIN SWITCH* on to connect the main power supply.
3. Verify that each channel is programmed with the correct percentage. If not move to the program screen and set the correct formula.
4. Make sure that all the raw material containers contain the correct raw material.
5. Turn *SYSTEM* switch to the on position.

4.2. Bringing the Unit to a Full Stop

The following procedure describes how to stop the unit, after which, the unit can be serviced. It is assumed that the unit is working.

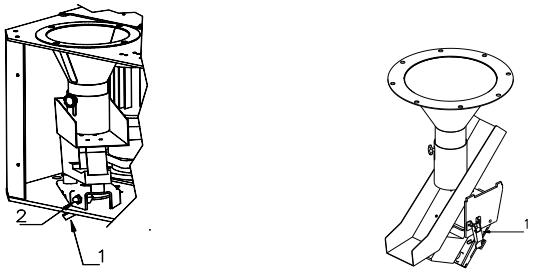
1. Turn *SYSTEM* switch to the off position.
2. Wait for the system status indicator to go off.

Note: to stop the unit, in the middle of a batch preparation cycle, move *SYSTEM* switch to off and continuously press the *ALARM CANCEL* push-button for 10 seconds.

4.3. Cleaning the Unit from a Previous Job

The following procedure is to be used when a complete cleaning of the unit is required:

1. Bring the unit to a full stop (See 4.2).
2. Turn off the hopper loader of the system (via program screen).
3. Empty the main channel by pushing the *CHANNEL #1 EMPTYING* button in the operate screen. The valve stays open as long as the button is pressed.
4. Empty vibrational channels:
    - Channels 2-5 on CD400/CD800 units – unlock the clamps at the bottom of the vibrator's support and rotate the vibrator backwards. The material flows from the rear of the funnel.
    - Channel 6 on CD400/CD800 – same as channels on CD100.
    - On the CD100 – rotate the vibrator sideways, and start it manually by pressing the pushbutton on the vibrator.



CD100 **CD400/800**

Figure 4.3-1 – Purging Material

5. Clean the containers.
6. Turn the main switch off.
7. Open the mixing chamber service door. Clean both the interior and the exterior of the weighing bin with compressed air.

Note: try not to touch the bin. In any event, be careful not to apply pressure on the weighing bin or the loadcell may be damaged.

8. Drain the mixing chamber by opening the drainage outlet and clean with compressed air. Close the service door and turn the main switch back on.
9. Close all service doors.

4.4. Entering a New Formula into the Unit

1. Press the *PROGRAM* key on the display.
2. Set the desired percentage for each additive channel. Remember that the main channel can be zero or 20-100% and that the formula must add up to 100%
3. Press the *Formula Replace* key to activate the new formula.

Note: it is recommended that the mixing chamber be drained whenever the formula is changed. It is obvious that the mixing chamber should be drained and cleaned while changing materials (especially colors) but it is less obvious if only a change in percentage is needed. The reason behind this is that the mixing chamber always contains blended material. This is done to improve the accuracy of the unit, as well as to facilitate the use of the unit as an “active hopper” above the process machine. If the formula is changed without draining the mixing chamber, the new batches will mix with the old ones, causing a very slow and gradual change.

5. Service and Maintenance

5.1. Load-cell Calibration

Load-cell calibration is carried out in order to verify that the load-cell is operating properly and to ensure that the weight reported by the unit is identical to the actual weight of raw material in the bin. It is recommended to perform this calibration every six months.
During the calibration procedure, three checks are performed:

- Hysterasis Test – ensures that there is no friction in the load-cell and weighing bin.
- Calibration Test – ensures the correct ratio used by the unit, to convert from the load-cell voltage output to the actual displayed weight.
- Linearity Test – ensures the linearity of the load-cell.

There are two important notes about these tests:

1. Each of these tests must be performed in order to ensure proper functioning of the unit.
2. There is no point in performing a test if the unit failed a previous test. For example, if the unit fails the hysterasis test then there is no point in performing the calibration test, because there is some friction (mechanical or otherwise) that is preventing the load-cell from working properly.

Calibration Procedure:

1. Bring the unit to a full stop by turning *SYSTEM* switch to off, wait for the system to finish the current batch and for the bin to open.
2. If the unit is floor-mounted, disable blend conveying from the unit. (The air flow may exert pressure on the load-cell).
3. Open the service door on the mixing chamber and clean the weighing bin. In addition clean the space between the load-cell and the plate above it. Make sure nothing is touching the bin, and that there is nothing above the load-cell.
4. Press the *SERVICE* button on the display and then press Calibrate. The display switches over to the calibration screen. This screen has the following fields:
    - *Ampl.* – displays the weighing amplifier output voltage.
    - *Mass* – shows the actual net weight.
    - Ref – the reference weight used in the calibration procedure.
    - *Calibrate Mode* – press this button to enable calibration of the system. Once you press the *Calibration Mode* button, two more buttons will appear:
        - *TARE* – this button sets the zero point of the load-cell.
        - *CAL* – this button calibrates the weighing

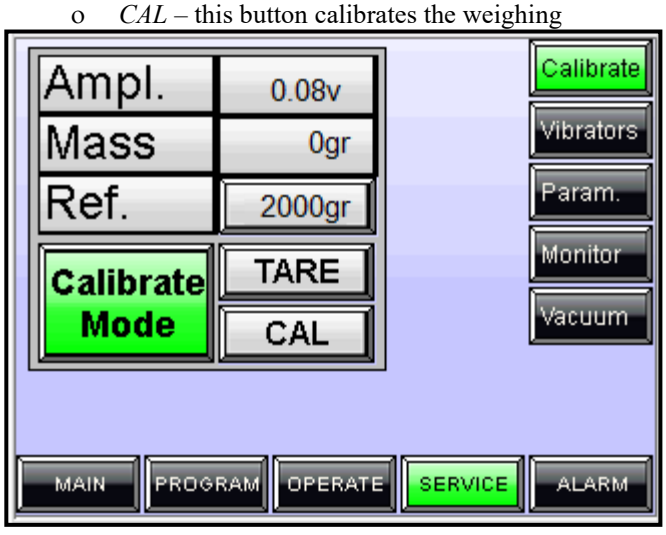
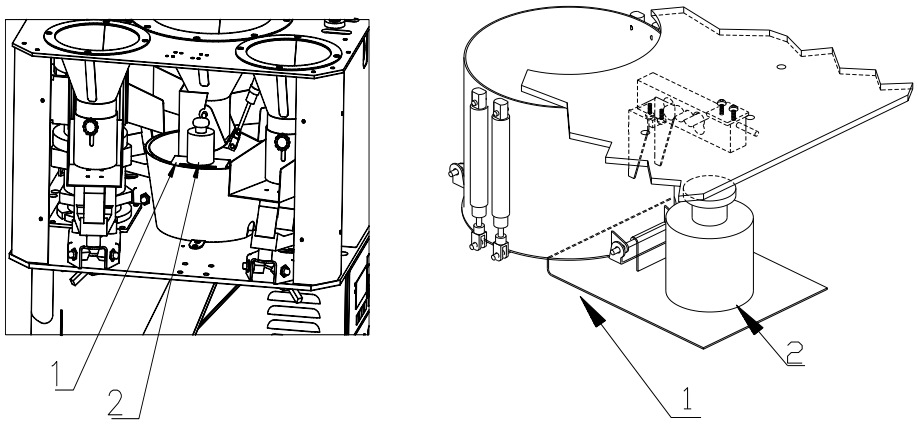


Figure 5.1-1 – Calibration Screen

Note: when activating calibrate mode the bin door will close and will remain closed while the system is in calibrate mode.

Entering the Service screen requires an access code. The default code is 4321.

5. When there's no load on the bin, the voltage display *Ampl* should show 0.00±0.1V. If the value exceeds this tolerance, make sure the weighing bin is empty and has no forces exerted on it. If the value is still not zero, perform amplifying card calibration (see 5.6) and perform a complete calibration procedure (see 5.1).
6. Open the service door on the mixing chamber and install the calibration tray. Wait 10 seconds for the weight to stabilize. Press *TARE* so the unit can "learn" the weight of an empty bin. The *Mass* value should show 0 (zero).



CD100 **CD400/800**

Figure 5.1-2 – Calibration Tray

1 – Calibration Tray 2 – Calibration Weight

7. Hysterasis test – gently press the weighing bin and release it. The value *Mass* should increase and then drop back to zero, meaning that it returned to its original weight. Allow a tolerance of 2 grams. Gently pull the bin up and let go of it, the value should now drop below zero, and then return to zero.
8. Calibration test – press *TARE* to counter any residual effects from the hysterasis check. Put a reference weight according to unit model on the calibration tray. The weight of the reference weight must be known within 1g. Make sure the *Ref* value matches that of the reference weight, or change the *Ref* value accordingly. If the load-cell is calibrated, the *Mass* value should match that of the *Ref* value (allow a tolerance of 2 grams). If the weight reported matches that of the reference weight, skip to step 10. If not, perform steps 5-8 again, before continuing to step 9. The reason for redoing steps 5-8 is that it's not likely that the conversion factor has changed because the amplifying card's gain is very stable and so is the load-cell.

   Recommended reference weights for the calibration test according to model:

CD100	CD200	CD400	CD800	CD800HD200/400/500
1.000 – 2.000Kg	1.000 – 2.000Kg	3.000-4.000Kg	7.000-8.000Kg	10.000-12.000kg

9. Calibration – after performing steps 1 through 8, while the reference weight is still on the tray, press *CAL*. The unit calibrates itself and the *Mass* value will match the *Ref* value (±1g).
10. Linearity test – place a weight that is different from the weight used for the calibration on the tray. Check that the *Mass* value matches that of the new weight. This can be repeated with additional reference weights in order to verify the whole range.

Recommended reference weights for the linearity test according to model:

CD100	CD200	CD400	CD800	CD800HD200/400/500
400-600g	1.000 -1.500Kg	1.500 -2.500Kg	3.500 – 4.500Kg	5.000-8.000kg

11. Remove the calibration tray and close the service door. When the *SYSTEM* switch is turned back to on, the unit will automatically exit calibration mode. Alternatively, exit calibration screen by pressing any of the menu buttons.

5.2. Vibrator Tuning

5.2.1. Vibrator Screen

The vibrator tuning screen enables adjusting the vibration cycle time of each vibrator and manually operating each vibrator for testing. This screen shows the following parameters:

- *Channel* – selecting the channel to tune and test.
- *Power* – manually operating the current channel.
- *Cycle* – the vibration cycle time of the current channel's vibrator.
- *Flow parameter* – controls the vibration power.
- *Act frequency* – the working frequency of the current channel's vibrator.
- *Act power* – the current power of the current channel.

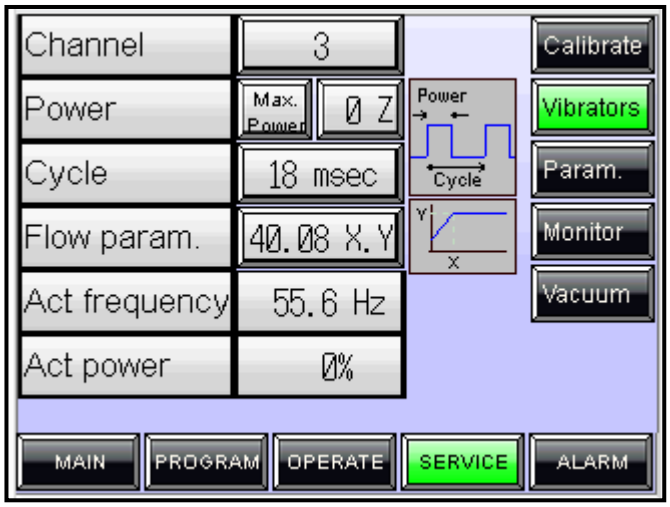


Figure 5.2-1 – Vibrator Tuning Screen

The cycle time of each channel is set by Sysmetric during manufacturing and should not be changed without consulting Sysmetric technicians. The default *Cycle* times are:

CD100	CD200	CD400	CD800
16-18	16-18	16-18	20-21

5.2.2. Manually Operating the Vibrators

1. Bring the unit to a complete stop.
2. Switch to vibrator tuning screen, press the *SERVICE* button and then press *Vibrators*.
3. Select the desired *Channel* (2-5) by entering its number. i.e.: *Channel*: 2
4. Change the vibration amplitude up to maximum by entering: *Power*: 19z
5. Check that the act power is 100% (*Power* = 19z = 100%). If not, enter a higher unit number.

6. Check all channels to make sure that the vibrators are running properly.

Note: entering the Service screen requires an access code. The default code is 4321.

5.2.3. Sleeve Height Adjustment

Above each vibrator, on the output of the container, there is a sleeve that controls the flow of material down to the vibrator. Adjusting the sleeve's height affects the material flow rate. As a rule, the sleeve height should be as follows:

- Down to the minimum for very small percentages (below 2%), unless the pellets do not come out, in which case the sleeve should be lifted slightly.
- Half way up for most other cases.
- All the way up for hard-flowing materials (such as re-ground) or when the unit has a throughput problem.

5.2.4. Flow Parameter

The *Flow Parameter* determines the vibrator power and can be adjusted for different materials. The four digits of this parameter are divided into two groups with the format of xx.yy:

- yy – the second two digits define the minimum vibration power. The minimum power is calculated as a percentage by the ratio between the yy parameter and the cycle time:

$$Minimum \quad Power \quad = \quad \frac{yy}{Cycle \quad Time} \quad x \quad 100$$

  For example: for a relative power of yy=04 when the cycle time is 20msec the minimum vibrator power will be 20%.
  Normal values for yy are between 03 for small systems that require high accuracy to 08 for relatively large systems that work with high throughputs and/or recycled material.

- xx – the first two digits determine the threshold for maximum vibrator power. The system changes the vibration power linearly from the minimum power for 0 percent material up to the maximum power for xx percent material. If the set percentage of a channel is higher than xx the vibrator will always work at the maximum power.
  Normal values for xx are 40 for relatively large systems up to 80 for small systems with high accuracy.

5.2.5. Adjusting the Vibrator Core

Alignment of the vibrator core is required only after replacing or repairing the feeder itself. The direction of the core determines the air gap between the core and the armature coil. The air gap adjustment is a delicate procedure, which requires time, sometimes the orientation must be repeated several times. The correct adjustment position is achieved with the smallest possible air distance, but without the magnetic core faces actually making contact when maximum power is applied to the feeder. A setting with a large gap will not allow the feeder to reach a high output. An orientation with a small gap will cause mechanical damage while sounding a loud click. The air gap is adjusted using the adjustment screw at the back of the feeder. Turning the screw clockwise decreases the air gap, turning it counterclockwise increases the air gap.

Warning!
If a click is heard, stop the feeder operation immediately

To adjust the Vibrator core:
1. Bring the system to a complete stop.
2. Empty the feeder hopper you wish to adjust.
3. Loosen the security nut at the back of the feeder.
4. Go to the vibrators screen, select the desired *Channel* (2-5) by entering its number. e.g: *Channel*: 2 and turn on the feeder at maximum power (see "Vibrators screen").
5. Turn the core screw clockwise until you hear a mechanical click and turn back about half a turn.
6. Stop feeder operation.
7. Securely lock the security nut.

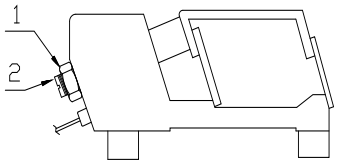


Figure 5.2. - Vibrational feeder
1 – Security nut 2 – Core screw

5.2.6. Concentricity Test

A concentricity test is designed to verify that there is no mechanical contact between the coil and the core. To perform the test:
1. Bring the system to a complete stop.
2. Empty the feeder hopper you wish to adjust.
3. Go to the vibrators screen.
4. select the desired *Channel*
5. Turn on the feeder at low power 8-9 (see "Vibrators screen").
6. Check continuous operation of the feeder at low power.

If the operation of the feeder is not normal, verify that voltage of about 100 volts at the feeder terminals.

For more details, see the FMC Service Instructions booklet for the F-TO model.

5.3. System and Batch Parameters

The unit has parameters that are factory set. These parameters are system constants and are never altered by the software. To modify those parameters, press *SERVICE* and then press *Param* to reach the parameters screen. The parameters in this screen are:

- *Bin size* – the maximum weight of material that the bin can contain.
- *Batch size* – the set weight for batch preparation.
- *Mixing time* – defines the mixing time at the end of batch cycle.
- *Max Dosing Error* – the alarm threshold. Above this value the system will alarm.

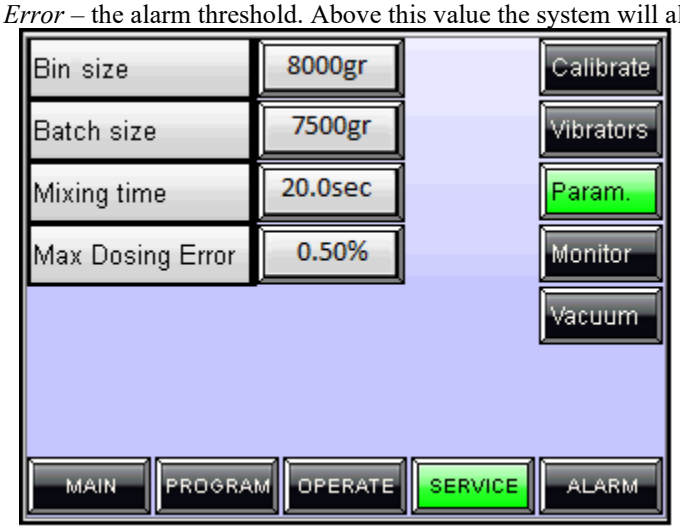


Figure 5.3-1 – Parameters Screen

Note: entering the Service screen requires an access code. The default code is 4321.

5.3.1. Bin Size and Batch Size

The *bin size* determines the maximum weight of material that can enter the bin without overflow. It is factory-set to fit the bin's physical dimensions and materials used in the process. It may be necessary to change this value if you detect that your material is overfilling the bin during operation. This happens in particular when working with large amounts of reground material.
The *Batch Size* value determines the batch size in grams. The amount per batch from each channel is the corresponding percentage of this amount. Normal values depend on the materials used and the bin's physical dimensions.
The following table details the recommended values for the *Bin size* and *Batch size*:

	CD100	CD200	CD400	CD800	CD800HD200/400/500
Bin Volume	4.2 Liter	6.5 liter	9 Liter	20 Liter	50 Liter
Bin size	2,100g	3,000g	4,100g	8,100g	22.00kg
Batch size	1,000-2,000g	1,000-2,800g	3,000-4,000g	6,000-8,000g	15.00-20.00kg

Note: If the bin size is smaller than the batch size, the batch will be prepared in several weighing cycles. This is an incorrect procedure, since the space between the bin and the mixer is limited. As a rule, set the batch size to 600 grams less than the bin size.

5.3.2. Mixing Time

The *Mixing Time* parameter determines how long the mixer works during each cycle. Normal values are between 20 and 35 seconds. The minimum mixing time is 10 seconds.

5.4. System Monitoring

Whenever the unit appears to be malfunctioning, the best thing to do is to watch the batch cycle and look for irregularities or deviations from the normal cycle (as described in section 2.11). Watching the weighing bin and channels shows you what the unit is doing. The monitor screen on the display shows you what the unit is supposed to do. A combination of both, plus a general understanding of how the unit works, is sufficient to solve most of the problems.

To reach the monitor screen, press the *SERVICE* button on the display and the *Monitor* button in the service menu. The screen content continually updates during batch preparation, showing the following parameters:

- *Channel* – the current working channel.
- *Set* – the set weight of material for the current channel.
- *Actual* – the actual weight of material from the current channel.
- *Weight* – the current total weight in the weighing bin.
- *Power* – vibration level of the vibrator (when the vibrator of the current channel is working).
- *Cycle* – the current batch cycle time.
- *Mixing* – the current mixing time.
- *Last work time* – last batch cycle time.

Figure 5.4-1 – Monitor Screen

Note: entering the Service screen requires an access code. The default code is 4321.

5.5. Vacuum

The vacuum screen enables monitoring the status of the hopper loaders and the vacuum pump. Press the *SERVICE* button on the display and the *Vacuum* button in the service menu to reach the *Vacuum* screen. The screen shows the following:

1. Hopper loaders:
   - Transparent if the hopper loader is off (the control switch of the hopper loader at the *PROGRAM* screen is off).
   - Filled (gray) if the hopper loader is switched on.
2. Vacuuming time – the last vacuum time of each hopper loader.
3. Material level proximity switch:
   - Orange if it senses material (the hopper loader is full).
   - Yellow if it does not sense material (the hopper loader is empty).
4. Vacuum valve:
   - Blue if the valve is closed (the hopper loader is not vacuuming currently).
   - Green if the valve is open (the hopper loader is currently vacuuming).
5. Flap door:
   - Closed when the flap door is closed (the reed switch on the flap door is closed).
   - Opened when the flap door is open (the reed switch on the flap door is open).
6. Vacuum pump:
   - Gray when the vacuum pump is off (the control switch of the vacuum pump on the *OPERATE* screen is turned off).
   - Green when the vacuum pump control switch is turned on.
   - Flashing green if the vacuum pump is currently working.
   - Red when the vacuum pump is in error.
7. Vacuum Pump valves:
   - Blue if the valve is closed.
   - Green if the valve is open.

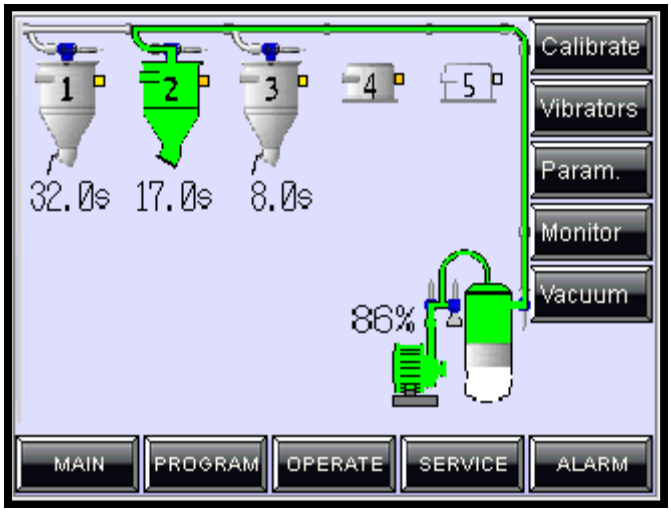


Figure 5.5-1 – Vacuum Screen

Note: the various contents of the vacuum screen (i.e. hopper loader and vacuum pump) are available only if they are present and controlled by the dosing system.
Entering the Service screen requires an access code. The default code is 4321.

5.6. Amplifying Card Adjustment

The amplifying card is factory-set to work with the system's loadcell. In the following cases the amplifying card should be readjusted:

- Replacement of the loadcell.
- Replacement of the amplifying card (the new card should be adjusted).
- Difficulties in loadcell calibration.

The amplifying card is located inside the power cabinet of the dosing unit.

5.6.1. Analog Loadcell Amplifier

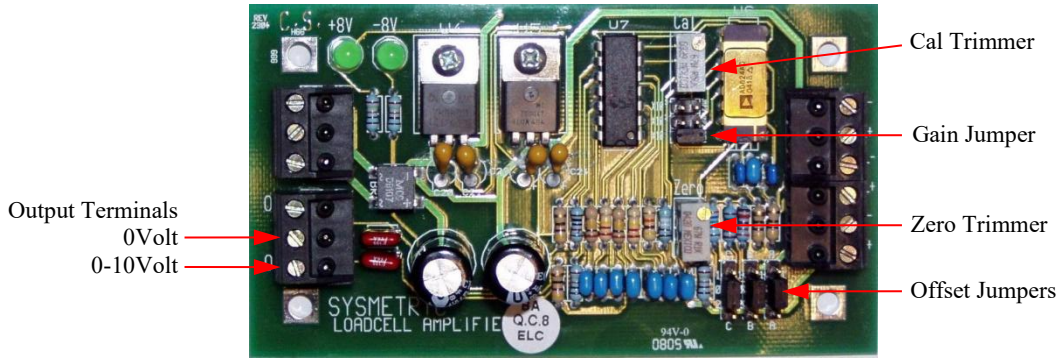
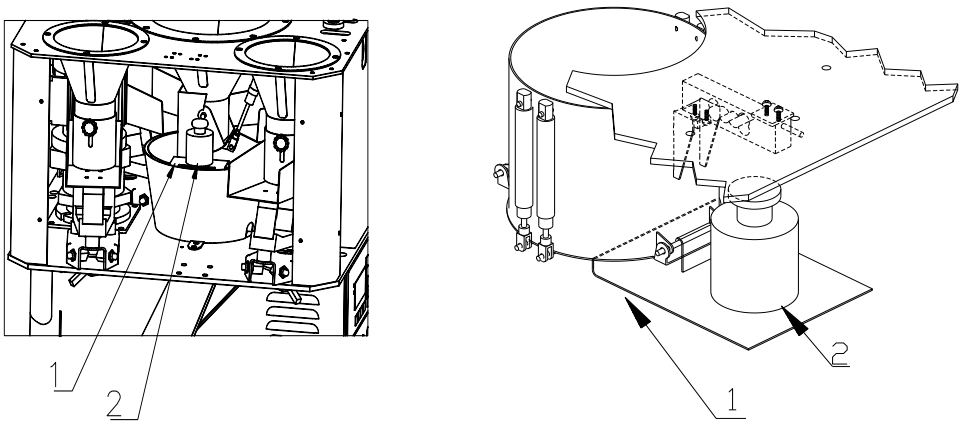


Figure 5.6-1 – Amplifying Card

The following procedure describes how to adjust the amplifying card to work with the loadcell:

1. Bring the unit to a full stop by turning *SYSTEM* switch to off, wait for the system to finish the current batch and for the bin to open.
2. If the unit is floor-mounted, disable blend conveying from the unit. (The air flow may exert pressure on the loadcell).
3. Open the service door on the mixing chamber and clean the weighing bin. Also clean the space between the loadcell and the plate above it. Make sure nothing is touching the bin, and that there's nothing above the loadcell.
4. Press the *SERVICE* button on the display and then press *Calibrate* to switch to the calibrate screen. Open the power cabinet to gain access to the amplifying card
5. Make sure that the gain jumper is closing the pins marked 10^1 and that the offset jumpers are at the center closing the pins marked 0.
6. Turn *Zero* trimmer counterclockwise approximately 20 turns.
7. Turn *Cal* trimmer counterclockwise approximately 20 turns.
8. Using a voltmeter, read the voltage at the output terminals of the amplifying card and adjust it to 0±0.1V by turning the *Zero* trimmer clockwise. The voltage at the calibrate screen should also read 0±0.1V.
9. Open the service door and install the calibration tray.



CD100 **CD400/800**

Figure 5.6-2 – Calibration Tray

1 – Calibration tray 2 – Reference weight

10. Put a reference weight on the tray and using the *Cal* trimmer on the amplifying card adjust the voltage according to the following table:

	CD100	CD400	CD800	CD800HD200/400
Reference Weight	1.000kg	4.000kg	8.000kg	8.000kg
Voltage/Kg	4Volt/Kg	2Volt/Kg	1Volt/Kg	0.3Volt/Kg

11. Perform the standard calibration procedure (See 5.1).

Note: amplifying card adjustment is no substitute for calibration. Always perform calibration after amplifying card adjustment.

5.6.2. Digital Loadcell Amplifier

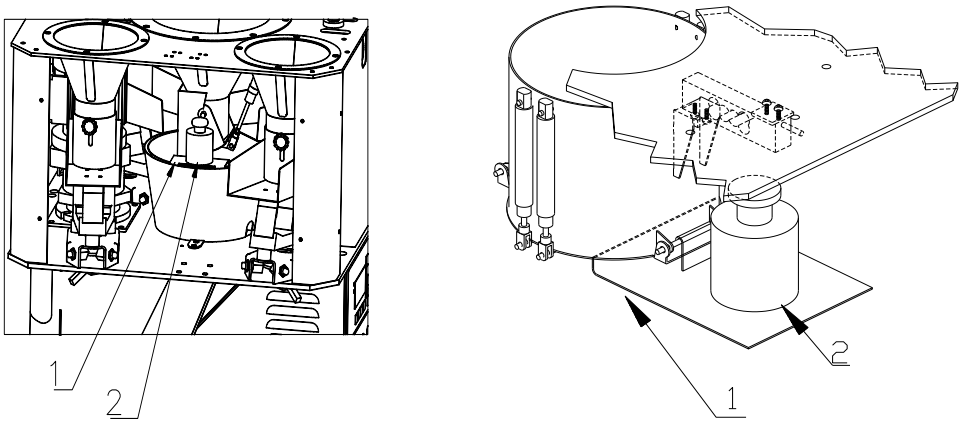
TOP				
COMM TX/A	COMM RX/B	COMM DGND	SUPPLY+	SUPPLY-

UPPER				
LC EXCIT+	LC SIGNAL+	LC SENSE+	AOUT-	AOUT+
LOWER				
LC EXCIT-	LC SIGNAL-	LC SENSE-	LC SHIELD	AGND

Wire Connections

The following procedure describes how to adjust the digital amplifying card to work with the loadcell:

1. Bring the unit to a full stop by turning *SYSTEM* switch to off, wait for the system to finish the current batch and for the bin to open.
2. If the unit is floor-mounted, disable blend conveying from the unit. (The air flow may exert pressure on the loadcell).
3. Open the service door on the mixing chamber and clean the weighing bin. Also clean the space between the loadcell and the plate above it. Make sure nothing is touching the bin, and that there's nothing above the loadcell.
4. Press the *SERVICE* button on the display and then press *Calibrate* to switch to the calibrate screen. Open the power cabinet to gain access to the amplifying card
5. Make sure ID number is 0.
6. Press and hold SET for 2 seconds to enter calibration mode. ST LED will blink and Z/R LED will illuminate.
7. Using a voltmeter, read the voltage at the output terminals of the amplifying card and adjust it to 0±0.1V by pressing the + and – button. Press + and – simultaneously to automatically set the output to 0 volt.
8. Press SET to move to the gain calibration. Z/R LED will turn off and G/T will illuminate.
9. Open the service door and install the calibration tray.



CD100 **CD400/800**

Figure 5.6-3 – Calibration Tray

1 – Calibration tray 2 – Reference weight

10. Put a reference weight on the tray.
11. Using a voltmeter, read the voltage at the output terminals of the amplifier card and adjust it according to the following table. Press the + and – button to calibrate the voltage (gain). For easy calibration use the recommended reference weights and press + and – simultaneously to automatically set the output to 2 volts.

	CD100	**CD400**	**CD800**	**CD800HD200/400**
Reference Weight	0.500kg	1.000kg	2.000kg	5.000kg
Voltage/Kg	4 Volt/Kg	2Volt/Kg	1Volt/Kg	0.4Volt/Kg

12. Press SET to exit the calibration mode. G/T will turn off and ST LED will stop blinking.
13. Perform the standard calibration procedure (See 5.1).

Note: amplifying card adjustment is no substitute for calibration. Always perform calibration after amplifying card adjustment.

5.7. Raw Material Sensor

Raw material sensors are found in various places in the system. All systems have the Demand sensor, some have channel container sensors, and some have a low level sensor. The sensors are normally closed (N.C.) connected, which means that they activate the input to the PLC when the sensor does not detect material.
The sensor has an indicator LED and there are two types: one where the LED is on when the sensor detects material and one where the LED in on when the sensors does not detects material. This manual refers to the type of sensors where the LED is on when material is not detected.
The Sensor's sensitivity is calibrated by adjusting the sensitivity screw on the back of the sensor. On some sensors, the screw is covered with a plastic cap, which should be removed first. Turning the screw clockwise increases the sensitivity, and turning counterclockwise decreases the sensitivity.

Note: It is a common error to turn the cap instead of turning the calibration screw. This is because the cap has the shape of a screw itself. Be sure to remove the cap first.

5.7.1. Sensitivity Calibration

Follow this procedure to calibrate the sensor's sensitivity

1. Insure the sensor you are calibrating is free from raw material in and around the sensors vicinity.
2. Turn the sensitivity screw clockwise to increase the sensitivity until the LED lights up.
3. Slowly turn the sensitivity screw counterclockwise to decrease the sensitivity until the LED extinguishes. Turn the screw counterclockwise half a turn more.

6. Troubleshooting

An alarm condition exists whenever the system recognizes that a fault has occurred. When an alarm condition occurs the unit does the following:

- The alarm relay closes. Refer to the wiring list for details on how to connect a siren or main alarm indicator to this contact. Pressing the *ALARM CANCEL* button opens the relay but if the alarm condition continues, the contact closes again after 1 minute.
- While the alarm is active, a corresponding alarm message is displayed on the display. Pressing the *ALARM CANCEL* button also deletes this message. Further pressing the *ALARM CANCEL* button toggles the alarm messages of all active alarms.
- The alarm is written in the alarm log.
- The alarm indicator on the operator panel keeps blinking until the alarm is resolved.
- The system keeps trying to make batches as if an alarm has not occurred (except during weighing errors).

6.1. Alarm Log

The system creates an alarm log. Press the *ALARM* button on the display to switch to the alarm log screen.

Figure 6.1-1 – Alarm Screen

The alarm log shows the following details:

- The alarm that was activated.
- The time at which the alarm was activated.
- The status of the alarm – red if the alarm is still active or blue if the alarm was stopped.

In addition the log can be cleared by marking some or all the alarms and pressing the delete button.

6.2. Alarms List

The following is a list of alarm messages that appear on the display according to the active alarm, the possible causes for the alarm and the action to take.

6.2.1. "Bad Conveying Hopper Loader #"

Description:

Malfunction in one of the hopper loaders.

Causes:

1. Material is not available for the hopper loader.
2. Malfunction in the vacuum system.

Action:

1. Check material availability.
2. Check the vacuum system.

6.2.2. "Bin Not Close"

Description:

The weighing bin is not empty when starting a new batch.

Causes:

1. Material level in the mixing chamber is too high.
2. The weighing bin is not draining material.

Action:

1. Check that nothing interferes with material draining from the weighing bin.
2. Check operation of the Demand sensor in the mixer chamber.
3. Check the air pressure supply (check pressure level of 6.5Bar on the air regulation unit).
4. Check the air valve and the air piston of the weighing bin's door.

6.2.3. "Divider Piston Not in Position"

Description:

This message is only relevant in CD dosing system with dividers.

Action:

1. Check the divider piston and magnetic sensors.

6.2.4. "Emergency Stop P.B"

Description:

The emergency stop pushbutton on the power cabinet is pressed.

Action:

Release the emergency stop switch and press the alarm cancel push button for 3 seconds. The system will resume working from where it stopped.

6.2.5. "Formula Not Replaced"

Description:

The formula in the program screen is different from the working formula.

Causes:

1. The operator has forgotten to press the *Formula Replace* key.
2. The operator started to replace the formula and didn't finish.

Action:

3. Press the *PROGRAM* button and verify that the working formula is the correct one. Either replace the formula by pressing *Formula Replace* or change the percentages in the program screen, so that they are identical to the working formula.

6.2.6. "No Flow Channel #"

Description:

The load on the load-cell does not change when material is supposed to be flowing into the bin. The channel that should be feeding the material is indicated in the alarm message.

Causes:

1. The channel is empty.
2. The channel doesn't work (main channel). If a vibrational channel is not working, there are separate alarms for that.
3. The weighing bin is open.
4. The weighing bin isn't free to press the load-cell.

Action:

1. In accordance with the type of channel that is not working, do the following:
   - Vibrational channel – check the working channel to see if it is empty. If it is, refill the raw material container of the channel. If material is flowing and the alarm persists, go to step 2.
   - Main channel – check if the channel is open and whether material is flowing. If the channel is empty, refill the raw material container of the channel. If material is flowing and the alarm persists, go to step 2. If the valve is closed, make sure the unit is connected to the air supply (check pressure level of 6.5Bar on the air regulation unit).
2. If there is raw material flowing from the channel and the No-Flow alarm is on, it is possible that the unit is clogged up with raw material. If it is, first perform the cleaning procedure described in section 4.3 (apart from clearing the containers of the channels) then restart the system. If the problem persists, proceed to the following:
   Open the mixing chamber service door and check if the bin is closed. If it is, proceed to step 3. If the bin door is open during a No-Flow alarm, it means that something is preventing the weighing bin from closing. Check that the air pressure is okay and that nothing is mechanically preventing the bin from closing. If nothing can be found, replace bin pneumatic valve.
3. Check that the bin is fastened to the load-cell, and that the load-cell is fastened to the chassis of the unit. Make sure that the bin does not come in contact with anything but the load-cell. If everything seems fine, stop and clean the unit and perform a calibration procedure as described in 5.1.
1.

6.2.7. "Low Battery in PLC"

Description:

The power of the backup battery of the Omron PLC is low.

Action:

Replace the battery in the PLC.

Note: use only Omron's original battery (3G2A9-BAT08).

6.2.8. "Material Leaking From Channel #"

Description:

Material is leaking from the channel.

Causes:

1. On channel #1 – no air supply, air valve failure or mechanical interference.
2. On channels #2-#6 – vibrator controller malfunction

Action:

1. If the alarm is for channel #1 check:
   - Air pressure supply (check pressure level of 6.5Bar on the air regulation unit).
   - Check intactness of the air valve.
   - Verify no mechanical interference disturbs the channel from closing.
2. If the alarm is for channels #2-#6 check the vibrator controller.

6.2.9. "Mixer is Empty"

Description:

The material level in the mixer chamber is below the Demand sensor for a long time (usually more than 90 seconds).

Causes:

The system's throughput is not sufficient.

Action:

Consult with Sysmetric about increasing the system throughput.

6.2.10. "Mixer Not Rotating"

Description:

The mixer overload protection has turned on.

Causes:

1. There was a disruption in the power supply.
2. The mixer is rotating in the wrong direction.

Action:

1. Open the power cabinet and turn the overload protection back on.
2. Verify that the mixer is rotating in the right direction, positive pressure mixer - clockwise, negative pressure mixer – anticlockwise (see 2.7). If the mixer is not rotating in the right direction change the phase order.
3. Check the power supply – 400 - 480 VAC, 3 Phase. A missing phase causes the mixer to rotate in the wrong direction.
4. Verify that the mixer door is shut.
5. Verify that the mixer door magnetic safety sensor is working properly.

6.2.11. "Vibrator Not Connected in Doser #"

Description:

The vibrator is disconnected.

Causes:

1. The vibrator's wires are disconnected from the vibrator controller.
2. The vibrator is malfunctioning.
3. Vibrator controller malfunction

Action:

1. Verify the connections of the vibrator's wires with the vibrator controller.
2. Replace the vibrator.
3. Replace the vibrator controller.

6.2.1. Recycle Screw Overload

Description:

This message is only relevant in CD dosing system with side feeder (recycle screw). Indicates screw motor overload.

Action:

1. Check the motor overload

6.2.2. "Short Circuit in Vibrator #"

Description:

One of the vibrators is electrically shorted.

Causes:

1. The vibrator is malfunctioning.
2. The vibrator's wires are electrically shorted.

Action:

1. Check the vibrator's wires and verify no short circuit.
2. Replace the vibrator.

6.2.3. Jumping (Skipping) Channel #2 (Recycled)

Description:

This message is only relevant in CD systems with recycled channel (channel #2). Indicates that channel #2 is empty and is now being skipped.

6.2.4. "Vibrator Card is Not Responding"

Description:

No communication between the PLC and the vibrator controller.

Causes:

Blown fuse in the vibrator controller card.

Action:

Check the fuses on the vibrator controller card. If a fuse is blown replace it with a new one.

Note: only use glass cylinder fuse 5x20mm of 3.15Amp.

6.2.5. "Weighing Error"

Description:

An illegal voltage (less than -1.5VDC or higher than 8.5 VDC) from the amplifier card has reached the Analog/Digital converter on the PLC.

Causes:

1. The unit is clogged up with material.
2. No power reaches the amplifier card.
3. The load on the load-cell is outside the allowed range (either overload or negative load).
4. The load-cell is not properly connected.

Action:

1. Check whether the unit is clogged up. If it is, stop the unit and clean it. It may become clogged if the Demand sensor is malfunctioning, or if one of the channels is constantly feeding material due to a malfunction of some other component.
2. Check if the green power LED indicators on the amplifier card are on. If they are, go to step 3. Otherwise resume power to the amplifier card.
3. Open the service door. See that the bin isn't touching anything. Make sure that the bin is fastened to the load-cell and that the load-cell is fastened to the chassis.
4. Stop the unit and perform a calibration check as described in 3.4.

6.2.6. "Dosing Not Accurate"

Description:
This fault is triggered when the difference between the target percentage and the actual percentage of a specific material exceeds the value defined in the Max Dosing Error field. The recommended setting is 3.00%.

- The alarm will not be activated during the first four batches after:
- Turning off the dosing system main switch (**System Switch**)
- Changing the recipe
- Pressing the alarm reset button

Causes:

1. Insufficient air pressure in Channel 1 piston, causing the channel not to close properly.
2. Faulty vibrator in Channels 2–5.
3. Mechanical or human interference with material flow in the channel.

Action:
It is recommended to catch the fault while it is active by observing the dosing system during preparation of at least 5 batches. The alarm will appear after the problematic channel has dispensed material. Troubleshooting depends on the channel:
Channel 1 – Check proper operation of the closing piston, piston valve, and correct air pressure at the system inlet.
Channels 2–5 – Check the condition of the vibrator legs (rubber not cracked).

6.3. Other Problems

The following are problems not detected by the system. Each problem is described along with its possible causes and the appropriate troubleshooting procedure.

6.3.1. Unit Does Not Make Batches

Description:

The machine needs material but the system is idle.

Possible Causes:

1. *SYSTEM* switch is off.
2. An alarm condition prevents the unit from working.
3. Demand sensor senses material, therefore, no new batch is being prepared. (See 2.9 for a description of the Demand sensor)
4. The PLC is not in "RUN" mode.

Action:

1. Check the *SYSTEM* switch. If it is off, toggle it. If it is on go to step 2. When the *SYSTEM* switch is on, the system status indicator lamp should be either on or flashing, if it is neither, check the *SYSTEM* switch itself and the indicator lamp.
2. Check the system alarm indicator. If it is flashing see section 6.2. Otherwise, go to step 3.
3. Check if the Demand sensor detects material. If it is, open the service door on the mixing chamber and check if the sensor is indeed immersed in raw material:

- If it is immersed in material, then the mixer is full and the unit is OK. If the dosing unit is floor-mounted, check the conveying system from the unit to the processing machine.
- If there is no material, recalibrate the sensor, or replace it if necessary (see 5.7).

4. Try switching screens on the display. If there is no response, the CPU is probably not in "RUN" mode. Turn the power off, wait 10 seconds and turn the power back on.

6.3.2. Unit Does Not Stabilize

Description:

One of the product's attributes (e.g. color) is varying. Alternatively, the product is uniform most of the time, but once in a while a major deviation occurs. No unit alarms are active.

Possible Causes:

It must be noted that any part of the unit could be causing the problem. For example, even if there is a color problem, the problem may be in the main channel which may be working in parallel with the color channel and thereby causing the desired amount of color to be reached too soon.
These are the main causes:

1. Two channels are working in parallel due to a malfunction of some component.
2. A problem with the weighing unit.

Action:

1. Check whether any alarm is being reported by the system. You can press the ALARM CANCEL button to see whether there is an active alarm or press ALARM to check the alarm log and see if there was an alarm in the system.
2. Perform calibration check as described in 3.4.

6.3.3. Mixer Overload Protection Trips Repeatedly

Description:

The mixer's motor overload protection trips several times a day or it trips every time the motor is started.

Possible Causes:

1. The mixer is rotating in the wrong direction.
2. The load on the mixer motor is too high because of a mechanical problem or because the mixer is clogged up with material.
3. Overload protection malfunction.

Action:

1. Check that the mixer motor is rotating in the direction pointed to by the arrow on the back of the motor. If not, switch between two power phases. See 2.7.
2. See if the motor is overheating or if grease is dripping out of the gearbox. These are signs of overload, should they occur, check for possible reasons: mixer clogged up with material or some other mechanical problem.
3. Replace the overload protection unit with a new one of identical specification.

ATTENTION!
ALL OPERATIONS CONCERNING CHECKS AND REPLACEMENT OF ELECTRICAL PARTS MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY

6.3.4. The Unit Does Not Stay Calibrated Over Time

Description:

The unit often fails the calibration test and needs to be recalibrated. The hysterasis and linearity checks have been found to be ok.

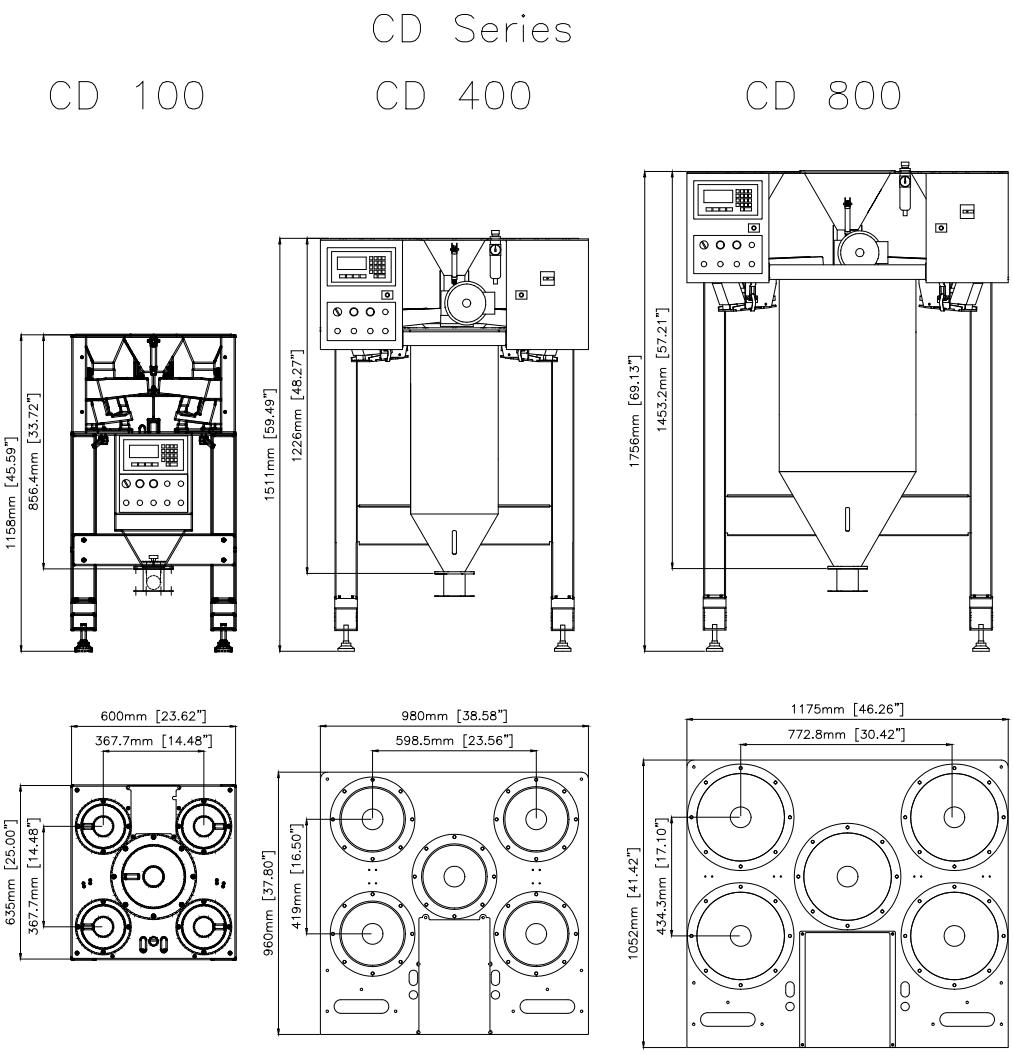
Possible Cause:

The power supply to the unit is not stable (typically too low).

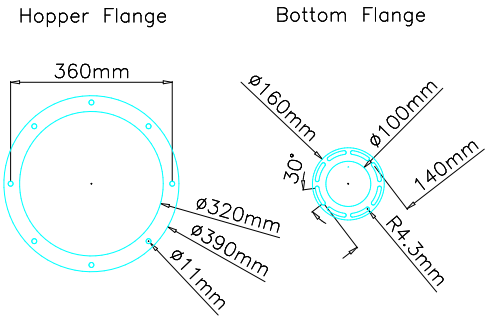
Action:

Measure the AC power supply to the amplifying card. The voltage between the two *9V* terminals (located on the upper left side of the card) and the *0V* terminal (located between the two *9V* terminals) should be 9-10VAC. If it is less than 9VAC, check the power supply to the dosing unit. The voltage should be within 10% of the rated voltage of the dosing unit. If the voltage is ok, perform calibration and check voltages periodically for an occasionally unstable supply.

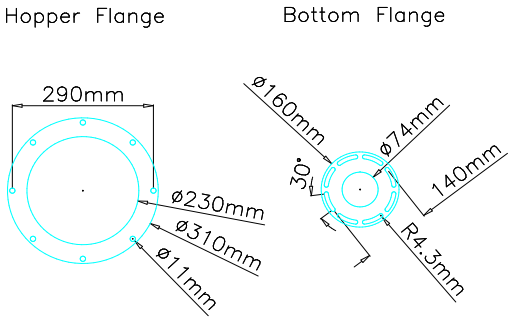
Appendix A – Dimensions and Volumes



General dimensions



Flanges dimensions CD800



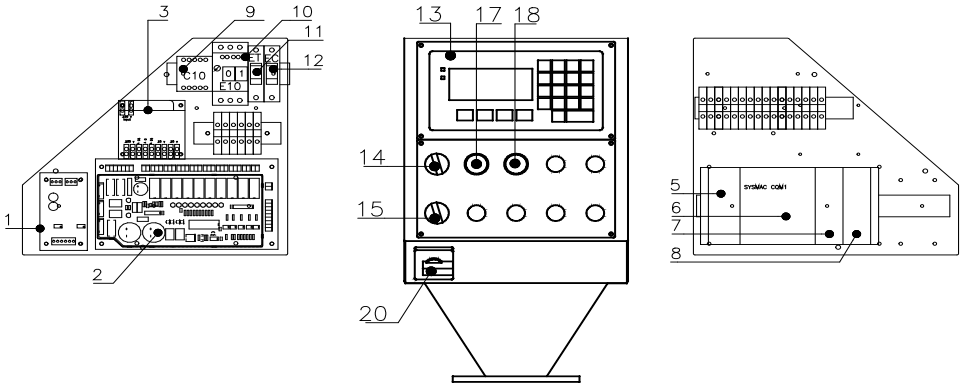
Flanges dimensions CD400/CD100

	CD100	CD400	CD800	CD800HD200	CD800HD400
Main Channel Container	3.3 Liter	3.3 Liter	7.3 Liter	7.3 Liter	7.3 Liter
Vibrator Channel Container	1.2 Liter	3.3 Liter	7.3 Liter	7.3 Liter	7.3 Liter
Weighing bin	4.2 Liter	9 Liter	20 Liter	50 Liter	50 Liter
Mixer Chamber	11 Liter	20 Liter	60 Liter	60 Liter	90 Liter

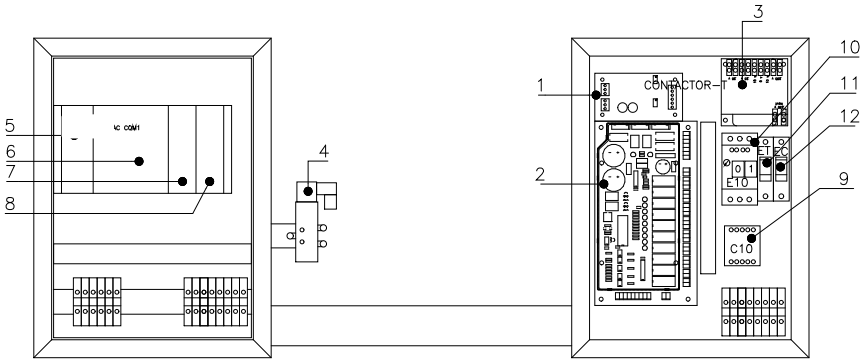
Volumes Table

Appendix B – Spare Parts List

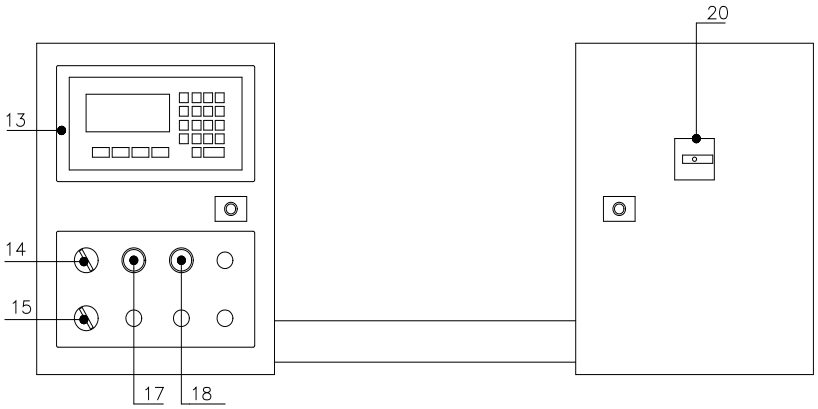
When ordering spare parts, specify the item number, catalog number and description.



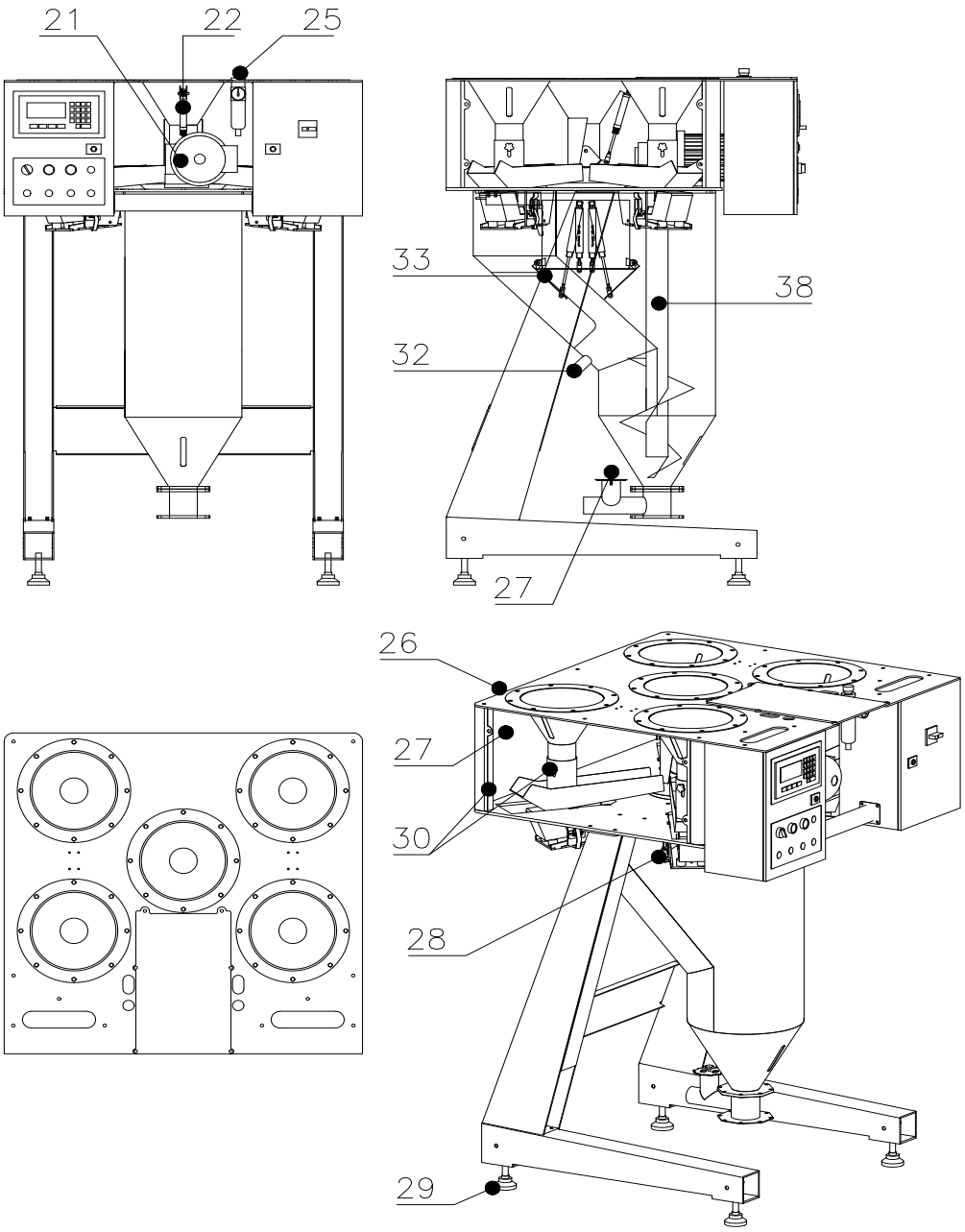
Power and control cabinets CD100



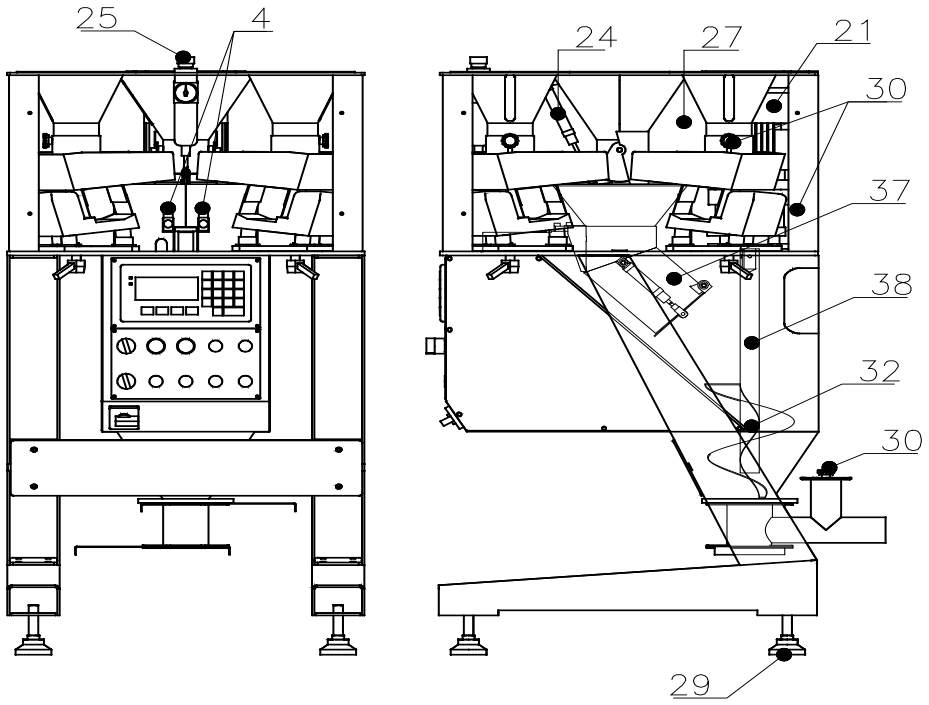
Power and control cabinets CD400/CD800 (interior)



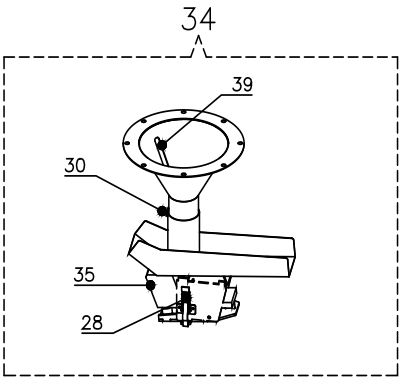
Power and control cabinets



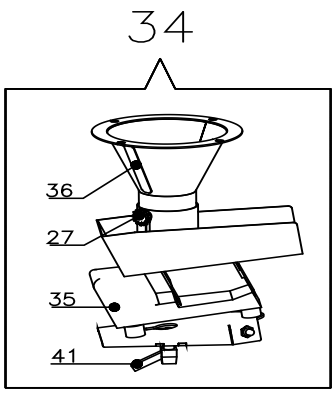
General View CD400/CD800



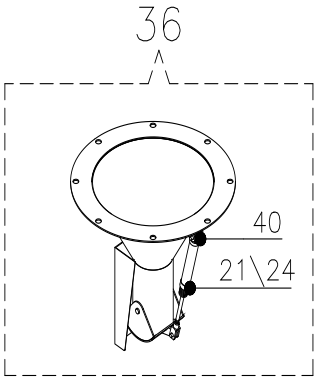
General View CD100



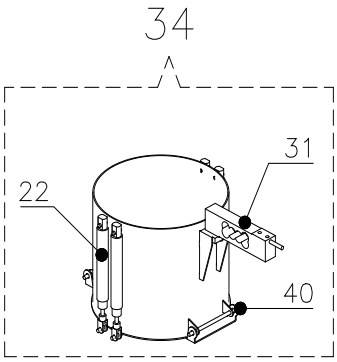
Vibration channel CD400/CD800



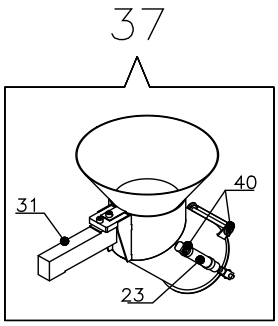
Vibration channel CD100



Main channel



Weighing bin CD400/CD800



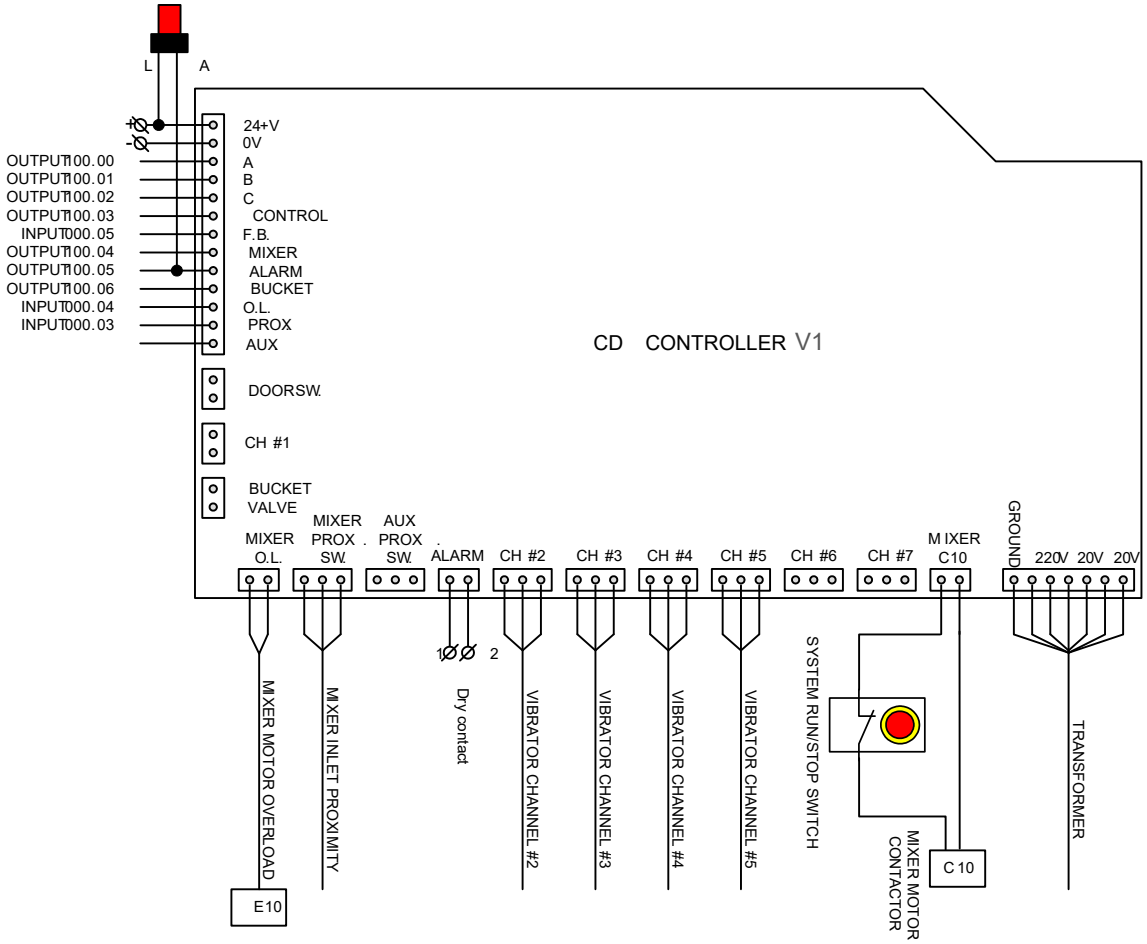
Weighing bin CD100

Item	Catalog Number	Description
1	*	Weighing load cell amplifier
2	M-A15	CD Controller (vibrators operating card)
3	E62	Transformer 230V / 10, 0, 10, 20, 20,230
4	P101	Solenoid Valve 24V DC 5x2 1/8”
5	E-100	Power Supply 2.5amp
6	*	CPU for CQM/CJ/CP1L PLC
7	*	Input CQM/CJ card
8	*	Output CQM/CJ card
9	AB 100-M05	Mixer motor contactor
10	AB 140M-C2M-1-1.6	CD100, CD400 Mixer motor overload
10	AB 140M-C2M-2.5-1.6	CD800 Mixer motor overload
11	AB B-S271M1A	Semi-automatic fuse, 1Amp, for power supply
12	AB B-S191C6	Semi-automatic fuse, 6Amp, for PLC
13	*	Omron NT/NS/NB display
14	AB 800EP-LSM23	Selector switch green lighted head
15	AB 800EP-LSM25	Selector switch orange lighted head
16	AB 800E-3DLOX10	Lighted switch complete
17	AB 800EP-LF4	Lighted push button head, red
18	AB 800EP-FA6	Lighted push button head, blue
19	AB 800E-3LX10	Switch complete
20	AB 194L-E12-1753	Main contactor
21	M-M4-3	Gear Motor for CD100
21	M-M4-5	Gear Motor for CD400
21	M-M4-7	Gear Motor for CD800
22	P1	Air cylinder 16x80 ISO, Weighing bin CD400&CD800
23	P2	Air cylinder 16x25 ISO, Weighing bin CD100
24	P3	Air Cylinder 16x50 ISO, Filling Valve CD100
25	P200	Air regulator with filter
26	231-3	Transparent cover, rear, for CD100
26	231	Transparent cover, rear, for CD400
26	231-1	Transparent cover, front, for CD800
27	232-3	Transparent cover, side, for CD100
27	232	Transparent cover, side, for CD400
27	232-1	Transparent cover, side, for CD800
28	M400	Spring Lock 6701
29	M3	Adjustable foot pad M16
30	M300	Screw with plastic head M6
31	E1040x15	Load Cell 15kg Tedea 1042, for CD100 & CD400
31	E1040x30	Load Cell 30kg Tedea 1042, for CD800
31	E1040x50	Load Cell 50kg Tedea 1042, for CD800 HD
32	E1	30mm Capacity switch, 24V DC
33	E2	Mixer door sensor
34	B1303	CD100 vibration channel assembly
34	B1300	CD400 vibration channel assembly
34	B1301	CD800 vibration channel assembly
35	M2101	Vibrator FMC FT-0
36	A3503-1	CD100 Central channel assembly
36	A3502	CD400 Central channel assembly
36	A3501	CD800 Central channel assembly
37	B2010	CD100 Weighing bin
37	A2001	CD400 Weighing bin
37	A2002	CD800 Weighing bin
38	A1200-18	CD100 Mixer standard auger
38	A1200-19	CD100 Mixer double auger

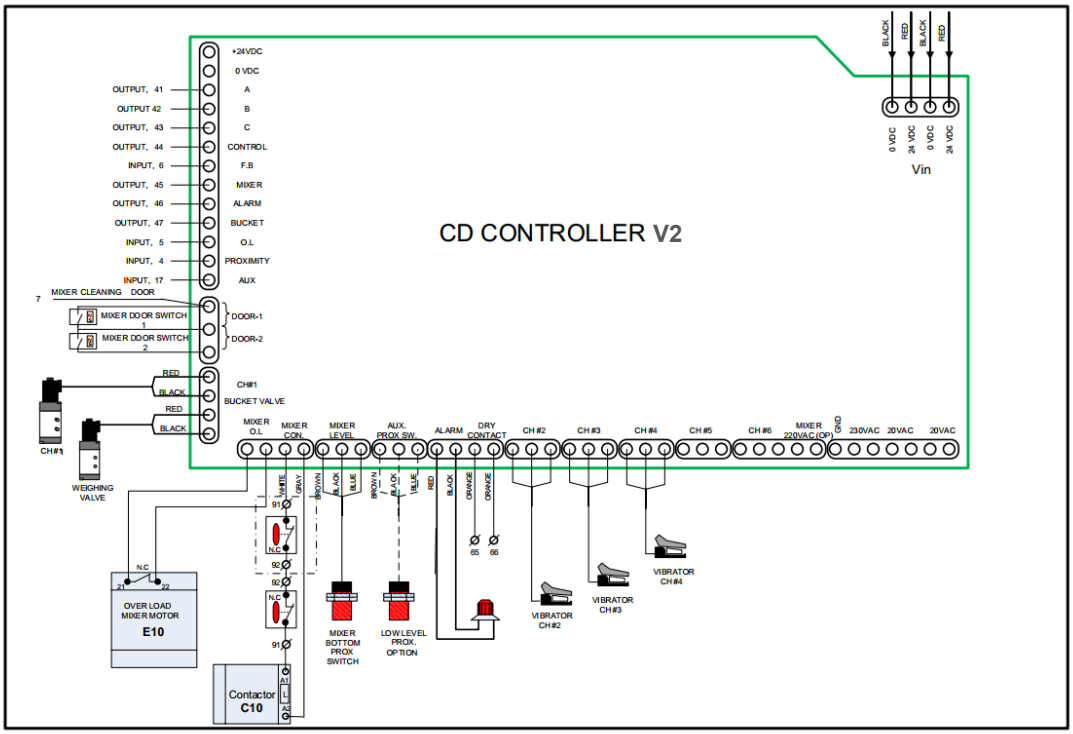
38	A1200-20	CD100 Mixer pushing auger
38	A1200-10	CD400 Mixer standard auger
38	A1200-11	CD400 Mixer double auger
38	A1200-12	CD400 Mixer pushing auger
38	A1200-14	CD800 Mixer standard auger
38	A1200-15	CD800 Mixer pushing auger
38	A1200-16	CD800HD-200 Mixer standard auger
39	100	Plastic glass
40	M1	Locking washer 6mm, starlock
41	M400-1001	CD100 Vibrator locking handle

* Per system configuration

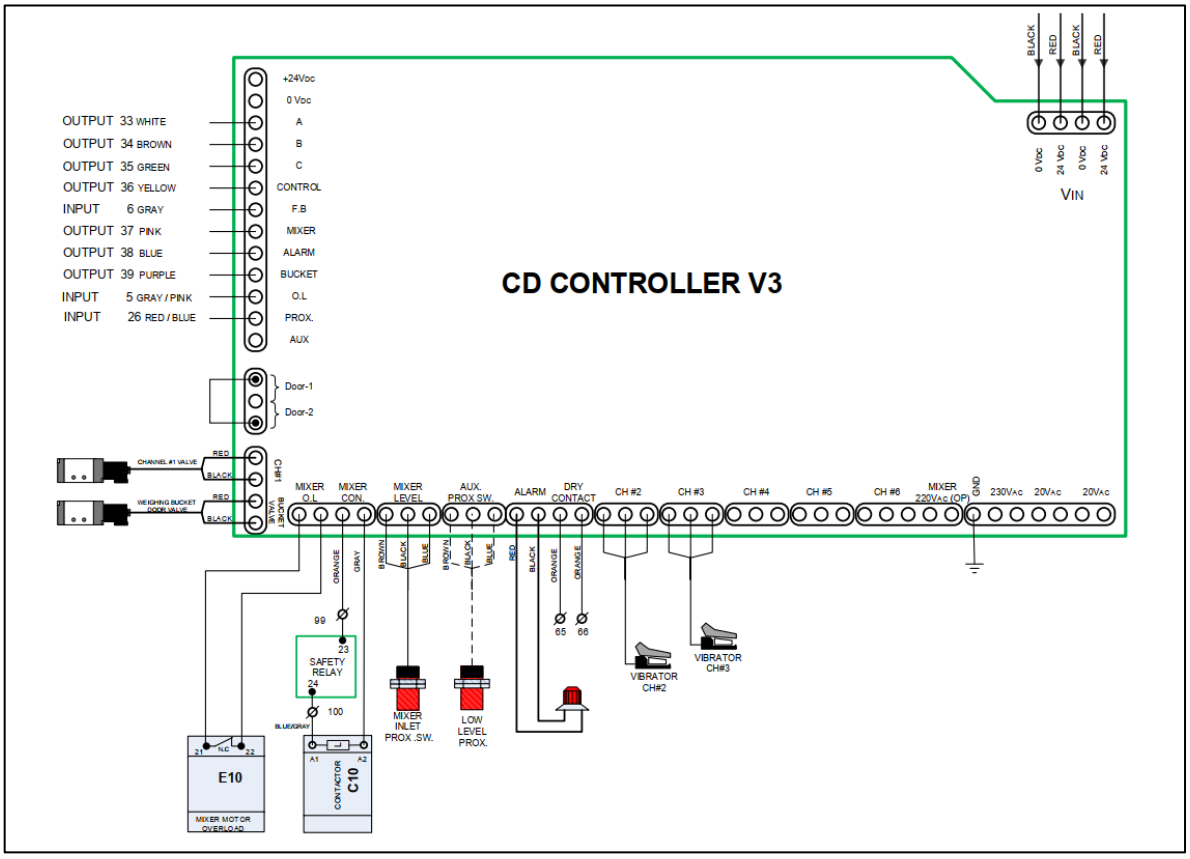
Appendix C – Electrical Diagram of CD Controller V1 (up to 2017)



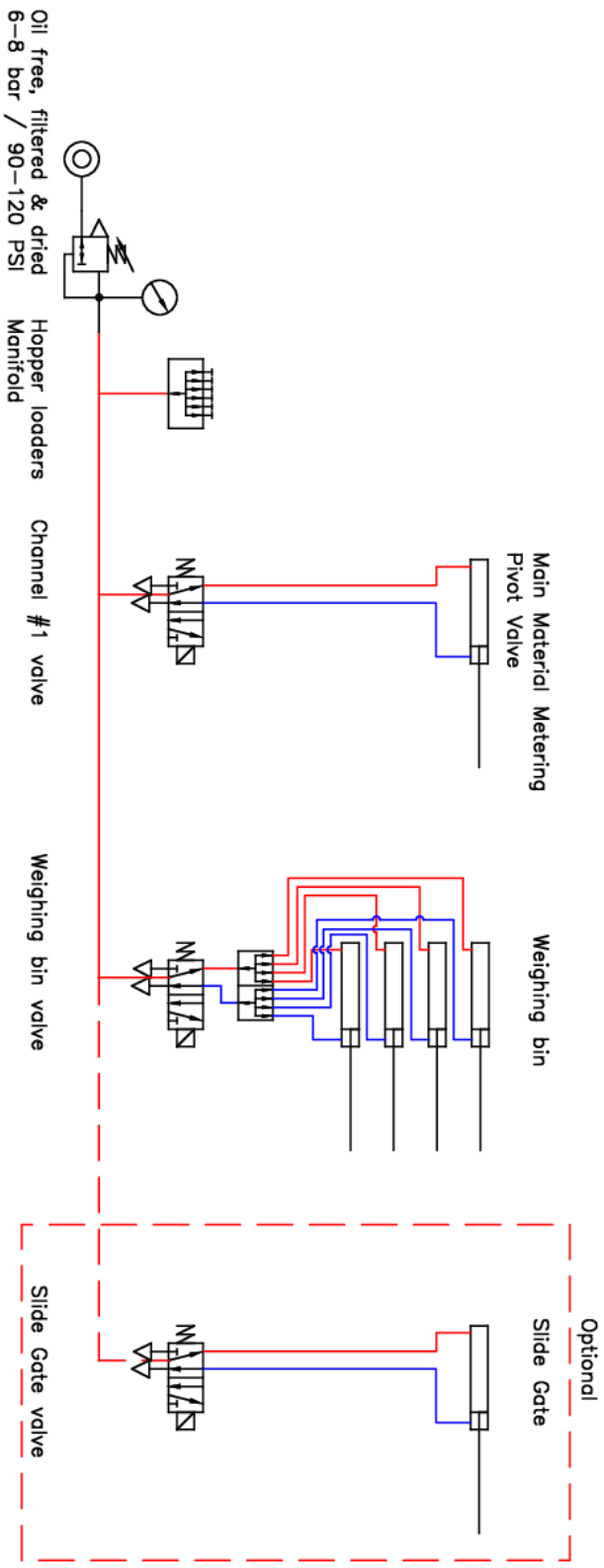
Appendix C1 – Electrical Diagram of CD Controller V2 (from 2017)



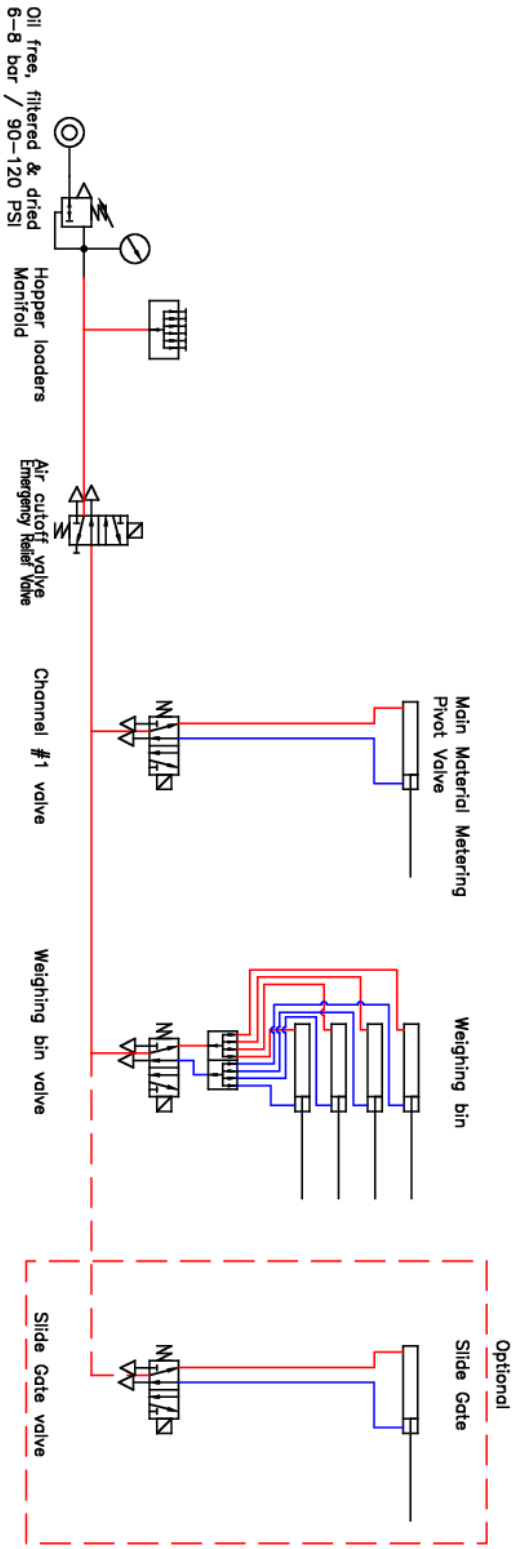
Appendix C2 – Electrical Diagram of CD Controller V3 (from 2020)



Appendix D – Pneumatic Drawing (prior to 2017)



Appendix D1 – Pneumatic Drawing (from 2017)



Appendix E – System Specification

Power Supply

- Voltage – 3 Phases 400 - 480 VAC
- Frequency – 50/60Hz
- Current – 2 Amp

Air Pressure

- Supply – 6-8Bar dry air
- 8mm fast connectors

Dimensions

- CD100 – 600x635x1158mm
- CD400 – 980x960x1511mm
- CD800 – 1175x1052x1756mm

Weight

- CD100 – 110kg
- CD400 – 130kg
- CD800 – 150kg

Environmental Conditions

- Storage:
  - Temperature -20°C to 80°C
  - Humidity 0-90%
  - Altitude up to 5000m
- Operation:
  - Temperature 0°C to 50°C
  - Humidity 0-85%
  - Altitude up to 5000m

Standards

- CE Approved – EN61010, EN61326

Appendix F: Certificates of Conformity

HERMON LABORATORIES

CERTIFICATE

CERTIFICATE OF CONFORMITY

**With EN 60204-1:2006, IEC 60204-1:2005,
ISO/EN 12100-1:2005, ISO/EN 12100-2:2003**

Certificate Number SYSSAF_EN.21445C

This certificate of conformity has been granted to the applicant based on the results of tests performed by Hermon Laboratories on October 2004 – December 2004 and on further evaluations, performed on December 2010 - February 2011, on a representative sample of the specified product.

Product description

Tested item:	Gravimetric Doser
Models:	CD800, CD400, CD100
Serial number:	Sample

Applicant/Manufacturer details

Name:	Sysmetric Ltd.
Address:	26 Hatasia St. P.O. Box 1122, Afula 18550 ISRAEL
Telephone number:	+972-4-6405857
Fax number:	+972-4-6405911

This is to certify that the tested product sample satisfies the requirements of the above listed standard.

Measurement/test results are contained in the test report: SYSSAF_EN.21445
The comments in the associated test report shall be taken into account and used in conjunction with this certificate

Michael Brun,
Product Safety Group Manager
Hermon Laboratories Ltd.

February 23, 2011 **Page 1 of 1**

EXPERTS IN GLOBAL COMPLIANCE SOLUTIONS

EMC Radio Telecom Environmental Product Safety International Approvals

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Email: mail@hermonlabs.com, www.hermonlabs.com

HERMON LABORATORIES

CERTIFICATE

CERTIFICATE OF CONFORMITY

With EN 61326-1: 2006, industrial locations equipment, Class A standard, harmonized under article 6(2) of EMC Directive 2004/108/EC

Certificate Number SYSEMC_EN.21424C_rev1

This certificate of conformity has been granted to the applicant based on the results of tests and evaluations, performed by Hermon Laboratories on November 22, 2010 on representative sample of the specified product.

Product description

Tested item: Gravimetric Dozer
Models: CD100, CD400, CD800

Applicant/Manufacturer details

Name: Sysmetric Ltd.
Address: P.O. Box 1122, Afula Illit, 18550, Israel
Telephone number: +972 4640 5857
Fax number: +972 4640 5911

This is to certify that the tested product sample satisfies the requirements of the above listed standard/s.

Measurement/test results are contained in the test report: SYSEMC_EN.21424_rev1.

The comments in the associated (if applicable) test report/s shall be taken into account and used in conjunction with this certificate

Michael Nikishin,
EMC & Radio Group Manager
Hermon Laboratories Ltd.

December 7, 2010 **Page 1 of 1**

EXPERTS IN GLOBAL COMPLIANCE SOLUTIONS

EMC Radio Telecom Environmental Product Safety International Approvals

Hermon Laboratories Ltd.
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HERMON LABORATORIES

Certificate of Conformity
with EN 61010-1 standard

N° SYSSAF_EN.16034C

Product definition..... : Gravimetric Doser
Type (Model) ..... : CD800
Applicant/Manufacturer..... : Sysmetric Ltd.
Address..... : Afula Ilit, Israel
Telephone number ..... : +972 4 6405857

This Certificate of Conformity has been granted to the applicant based on the results of tests and evaluations, performed by Hermon Laboratories on representative sample of the above-mentioned product from October to December, 2004.

The tested products satisfy the requirements of:
IEC 61010-1:01
The standard covers full safety demands to the product.

Evaluations/tests results are contained in the test reports:
SYSSAF_EN.16034.

Ami Friedman,
Technical Manager
Hermon Laboratories Ltd.

6 October 2005

The comments in the associated (if applicable) test report/s shall be taken into account and used in conjunction with this certificate.
The A2LA logo endorsement applies only to the test methods and the standards that are listed in the scope of Hermon Laboratories accreditation.

Ralcevet Ind. Zone, P.O.Box 23, Binyamina 30550 Israel
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HERMON LABORATORIES

CERTIFICATE

CERTIFICATE OF CONFORMITY

With EN 60204-1:2006/A1:2009; IEC 60204-1:2005/A1:2008; EN ISO 12100:2010 standards

Certificate Number SYSSAF_EN.30000C

This certificate of conformity has been granted to the applicant based on the results of tests and evaluations, performed by Hermon Laboratories in August 2017, on a representative sample of the specified product.

Product description

Tested item:	Gravimetric Doser
Model:	CD800
Serial number:	Sample
Hardware version:	N/A
Software release:	N/A

Applicant/Manufacturer details

Name:	Sysmetric Ltd.
Address:	26 Hatasia St. P.O. Box 1122, Afula 18550 ISRAEL
Telephone number:	+972-4-6405857
Fax:	+972-4-6405911

This is to certify that the tested product sample satisfies the requirements of the above listed standard/s.

Measurement/test results are contained in the test report: SYSSAF_EN.30000.

The comments in the associated (if applicable) test report/s shall be taken into account and used in conjunction with this certificate

Michael Brun,
Product Safety Group Manager
Hermon Laboratories Ltd.

December 20, 2017 **Page 1 of 1**

EXPERTS IN GLOBAL COMPLIANCE SOLUTIONS

EMC Radio Telecom Environmental Product Safety International Approvals

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HERMON LABORATORIES

To whom it may concern:

Hermon Laboratories has tested Sysmteric's Gravimetric Doser model CD800 according to IEC/EN 61010-1 standard, and found it to be in compliance with the standard's requirements.

Sysmetric has declared that models CD100 and CD400 are reduced size and power version of model CD800 mentioned above

Our conclusion is, (according to Sysmetric's declaration) , That models CD100 and CD400 also meets IEC/EN 61010-1 requirements.

Amos Maor,
Product Safety , Staff Engineer,
Hermon Laboratories Ltd.

January 4, 2018 Page 1 of 1

EXPERTS IN GLOBAL COMPLIANCE SOLUTIONS

EMC Radio Telecom Environmental Product Safety International Approvals

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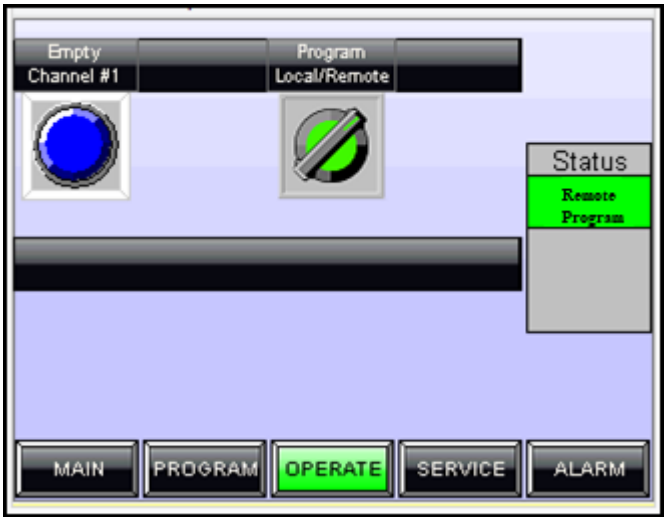
Appendix I: CD Series Dosing Systems with Remote PC Control

This option is available when the dosing unit is connected to a remote PC.
The Program Local/Remote switch appears in the **OPERATION** screen.
Program Remote – activating remote PC control only. This option enables formula replacement and totals reset via the remote PC only and not via the HMI screen. The Status in all relevant screens (**MAIN, PROGRAM & OPERATION**) will show *Remote Program*.
In this mode the channel percentages can only be set via the PC. In addition the material totals can only be reset via the PC.
Program Local- in this mode formula replacement and totals reset can be carried out via both the PC and the HMI screen.
The Status in all relevant screens (**MAIN, PROGRAM & OPERATION**) will show *Local Program*.

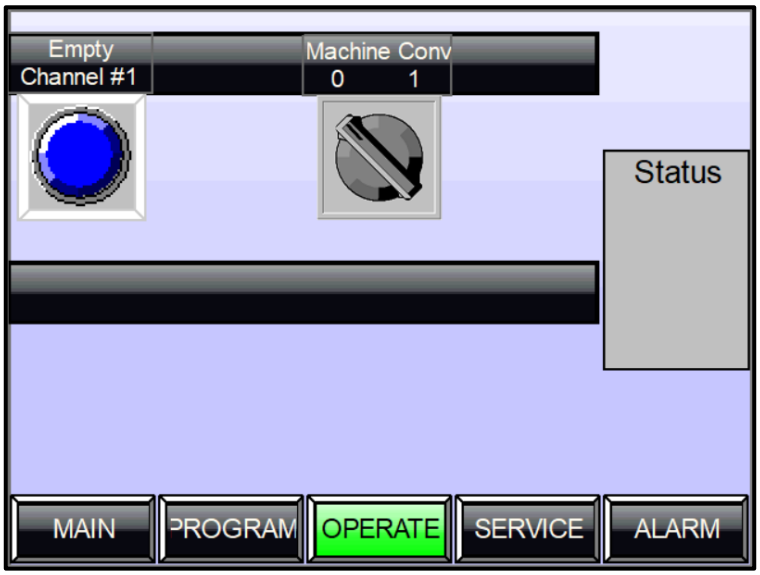


Operation Screen

Appendix II: CD Series Dosing Systems with Machine Loader

Machine Conv – activating hopper loader on the production machine for conveying material from the dosing unit to the production machine. This hopper loader is used when the dosing unit is not installed on top of the production machine.

Switch the machine conveyor ON/OFF in the **OPERATION** screen



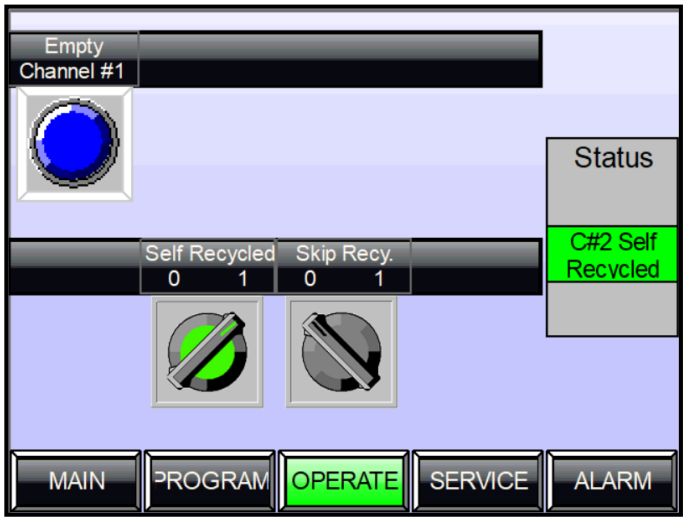
Operation Screen

Appendix III: CD Series Dosing Systems with Recycled Material and Channel Skipping

The dedicated recycled channel is channel #2 and it can work in two modes:

1. **Normal mode** (Self Recycled switch set to 0) – channel #2 is treated like any other component. In this mode automatic skipping is disabled.
2. **Recycled mode** (Self Recycled switch set to 1) – the material fed to channel #2 already contains all of the ingredients. Other additives ratio is automatically reduced accordingly to save money. In this mode, if channel #2 runs out of material the system will alarm and will automatically skip the recycled channel advancing to the next channel. This operation has no effect on the product and it will repeat every batch until the recycled channel is re-filled with material.

Enabling **Recycled** mode and auto skipping is carried out in the **OPERATION** screen.
In order to change the Recycled mode switch position – Channel #2 recipe % in the **PROGRAM** screen has to be zero.

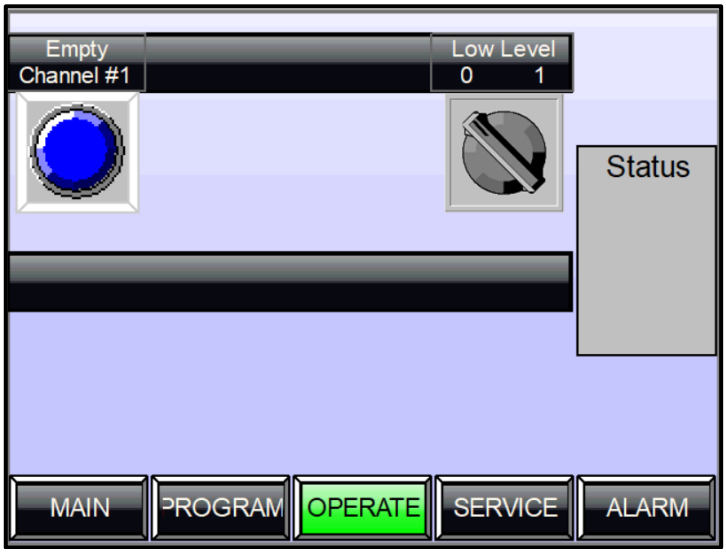


Operation Screen

Appendix IV: CD Series Dosing Systems with Low Level Mode

Low Level – preparing batches according to a low level proximity switch. When working at low level mode the system holds one prepared batch at the weighing bin which is dropped down to the mixing chamber according to the low level demand proximity switch (instead of holding the mixing chamber filled with prepared material). This option requires the installation of a low level proximity switch.

Switch the low level mode ON/OFF in the **OPERATION** screen.

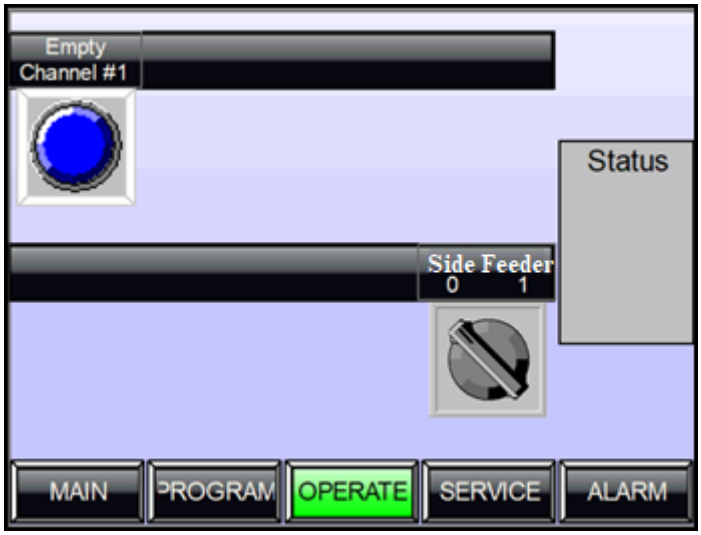


Operation Screen

Appendix V: CD Series Dosing Systems with Side Feeder (Recycling Screw)

This option is used to feed extrusion machines with continuous edge trimming.

Switch the feeder ON/OFF in the **OPERATION** screen.
When the SIDE FEEDER switch is ON it will automatically stop 30 minutes after the last batch preparation and will restart at the start of the next batch.



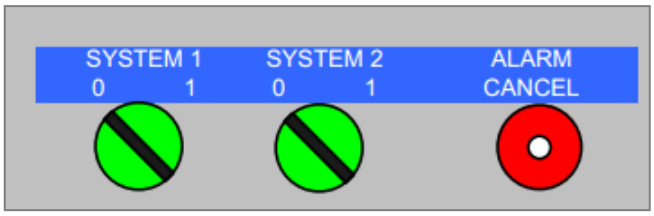
Operation Screen

Appendix VI: CD Series Dosing Systems with Divider

The Sysmetric CD Series dosing system has an option of a divider below the mixer.
The purpose of this is to use one dosing system to produce up to 4 different recipes at the same time.
Under the divider there are 2-4 containers.

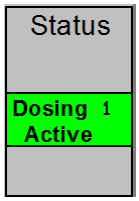
To set the recipe for each container – press “PROGRAM”
Use the “+” & “-“ to select the required container number.
Set the recipe and press “Recipe replace”.

Each container has is a green “System” switch on the panel.
To start dosing of each container – set the required “System” switch to “1”.



If container dosing is active – dosing system will keep making batches till material covers the top level proximity switch of the container.

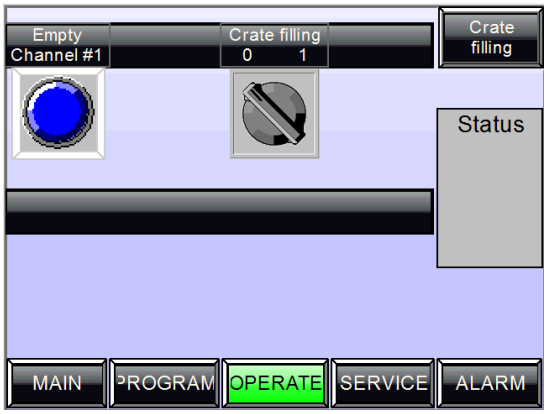
The “Status” section shows the number of the container whose recipe is in the weighing bucket.



The “Status” section also shows the number of the container whose recipe is in the mixer chamber.

Appendix VII: CD Series Dosing Systems with Crate Filling

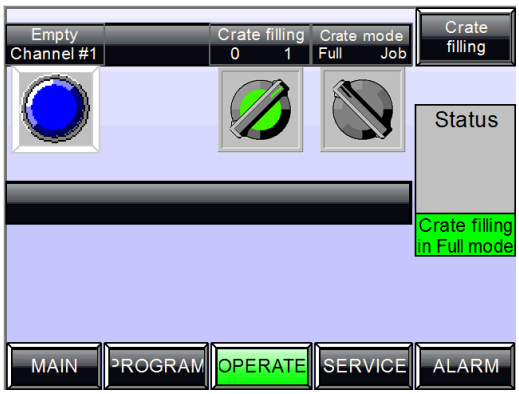
The CD batch type dosing system can fill crates with a blend of raw materials for the plastic industry. The system can be operated in three modes of operation according to the operation requirements: FULL CRATE MODE, JOB MODE & CONTINUOUSLY.
FULL CRATE: This mode fills crates to top and stops automatically while displaying the amount filled.
JOB MODE: This mode prepares a known amount of a blend into one or more crates.
CONTINUOUSLY: This mode works continuously.

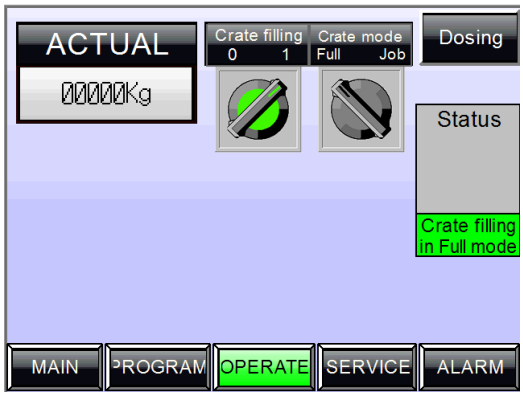


Operation Screen

Full Crate Mode

1. Switch the "CRATE FILLING" switch in the **OPERATION** screen to "1".
2. Switch the “CRATE MODE” switch to “FULL” position.
3. Push the “PROGRAM” button to display the **PROGRAM** screen.
4. Set recipe and press the "FORMULA REPLACE" button.
5. Position empty crate under the dosing system.
6. Turn “SYSTEM” switch to “1” (The green switch on the cabinet door).
   The system will prepare several batches, mix it and release into the crate.
7. Press “CRATE FILLING” button to get to the “CRATE FILLING” screen, to monitor the actual amount of material inside the crate.
8. When the crate is full, the system will set the alarm “FULL CRATE”. This screen also shows the amount of material in the crate.
9. Turn “SYSTEM” switch to “0”.
10. Flatten the pile to empty the material in the mixer.
11. Either start a different recipe (step 3) or continue with the current recipe (step 5).

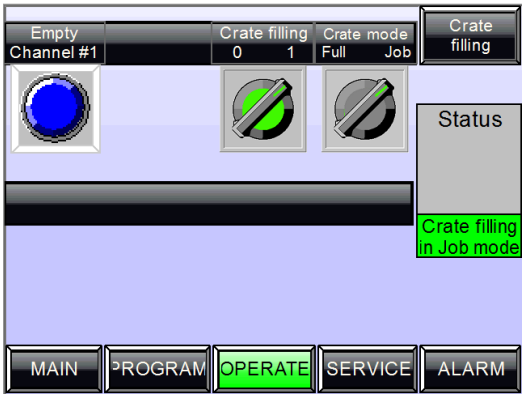


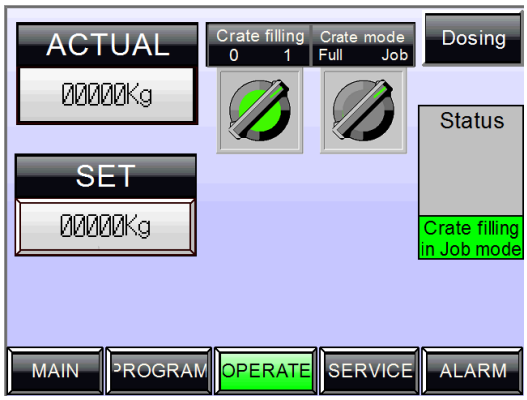


Job mode (according to weight)

1. Switch the “CRATE MODE” switch to “JOB” position.
2. Push the “PROGRAM” button to display the “PROGRAM” screen.
3. Set recipe, and press the "FORMULA REPLACE" button.
4. In "PROGRAM" screen - Push the “CRATE FILLING” button to get to the “CRATE FILLING” screen.
5. Set the job weight.
6. Locate empty crate under the dosing system.
7. Turn “SYSTEM” switch to “1” (The green switch on the cabinet door).
8. When the job will be completed, the system will set the alarm “JOB COMPLETE”. If one crate is too small for the job then the system will halt displaying the “FULL CRATE” alarm. The operator should flat pile, replace the crate and switch “SYSTEM” switch to”0” and “1” again.

* If a job has to be terminated before completion, turn the “SYSTEM” switch to “0” and the “CRATE FILLING” switch to “0”and press the alarm push button for 5 seconds. This will reset the job accumulator.





Continuously

1. Switch the “CRATE MODE” switch to “0” position.
2. Push the “PROGRAM” button to display the “PROGRAM” screen.
3. Set recipe, and press the "FORMULA REPLACE" button.
4. Turn “SYSTEM” switch to “1”.
5. The system will prepare batches continuously.