

user manual

Multi-Washer 10000 Series with Pneumatic Pump

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index

1.00	overview	page
1.01	Safety Precautions	5
1.02	Overview	5
1.03	Package Contents	6
1.04	Dimensions	7
2.00	installation	
2.01	Preliminary Tasks	8
2.02	Panel Mounting	8
2.03	Peripheral Elements	8
2.04	Tubing	9
	Water Inlet	9
	Chemical Pickup	9
	Distributor Manifold Hoses	10
	High Pressure Air Connection	10
	Optional Air-Assist Flush	11
2.05	Electrical Connections	11
	Input: Main Power Connection	11
	Input: Air Pressure Sensor Connection	12
	Input: Drum Level Sensor Connection	12
	Input: External Emergency Stop Connection	13
	Output: External Alarm Indicator Connection	13
	Output: Distribution Manifold Solenoid Connection	14
	Output: Air Assist Flush Connection	14
	Communication: Machine Communication Boxes	15
	Wiring	15
	Box Identification DIP Switch Settings	15
	End of Line Jumper	16
	Filter Voltage Input Jumpers	16
	Communication: Machine Signals	17
	Communication: DIP Switch 5 - Auto-Formula Select Time	17
3.00	system start-up	
3.01	Configuring the System Settings	21
3.02	Prime the Hoses that go to the Washer Extractors with Water	21
3.03	Prime the Suction Hoses of every Product	21
3.04	Calibration of Products	21
3.05	Calibration of Water	21
3.06	Check the Dosage Calibration with Manual Dose	21
3.07	Adjusting Flush Time for Each Washer Extractor	21
3.08	Test the System	21

	page
4.00 service parts	22
5.00 warranty	
5.01 Limited Warranty	24
5.02 Limitation of Liability	24

1.00 overview

1.01 Safety Precautions



WARNING! Please read precautions thoroughly before operation. Meet all applicable local codes and regulations.

THANK YOU FOR YOUR INTEREST IN OUR PRODUCTS

Please use this equipment carefully and observe all warnings and cautions.

- Both the unit and its peripheral elements must be handled by qualified technical personnel.
- Make sure the installation is carried out according to the current regulations of the state, county and city.
- Do not mount the unit on an irregular or unstable surface.
- This unit is designed to work in a vertical position.
- The unit must be installed in an area with adequate clearance, far from possible impacts, electromagnetic noise sources and pipelines of gas, steam or water.
- The top of the cabinet is not a shelf! Do not leave objects on the unit.
- Warranty is voided if the user modifies, adds or suppresses any feature of the unit.
- All components involved in maintenance tasks must be the ones registered in the spare parts list supplied by the manufacturer. Otherwise the Warranty is void.
- The installation of the dosing system must be performed according to the instructions of this manual.
- Main electrical power supply must be 110-230VAC, at 50 to 60 Hz.
- Always use wires in good condition.
- The water supply and high pressure air supply to the unit must conform to the specifications of this manual.
- The unit should be configured according to the programming manual.
- All chemical products must be stored in approved containers, at a safe distance from the unit.
- The handling of chemical products requires the proper safety measures such as protective glasses, mask and gloves.

1.02 Overview

The Multi-Washer 10000 Series units are designed to dose chemical products to multiple washer extractors in commercial/ industrial laundries. The maximum number of products that can be used with a single unit is ten (10).

Depending on the size of the washers in the laundry, the system can be configured with one or two dosing channels (consisting of collection manifold, a pump, a flow meter, optional air flush, and distribution manifold). But regardless of the number of dosage channels the maximum number of washers the products can be distributed to by a single unit is ten (10).

All the components of the system are consistent with general purpose industry standards, and the materials of construction are compatible with all normal laundry products.

The measurements made by the built-in flow meter ensure reliable, accurate and repeatable product dosage. The use of a flow meter also allows for additional safety measures and alarms to prevent mixing of chemicals.

The pneumatic wall-mount units have five major components:

- 1) The **collection manifold** (Mounted on the main panel.)
- 2) The **dosing channel** (From the collection manifold on the main panel out to the distribution manifold.)
- 3) The **distribution manifold**, (Mounted separately.)
- 4) The **calibration vase**. (Mounted separately.)
- 5) The **communications boxes** (To capture and transmit the signals from each washer extractor to the controller.)

When a qualified signal is detected by the communication box, the unit will dose the appropriate products according to the settings of the formula and washing phase being executed.

An external panel for an optional air flush can be used when larger doses or longer distances are required in order to deliver the chemical doses to the machines much faster and using less water.

1.00 overview

1.03 Package Contents

Multi-Washer 10000 with Pneumatic Pump, **1-Channel**

5 Product Systems

HYDSPD0036	5P, 4WE ,1CH,241,NEU,V
HYDSPD0019	5P, 6WE ,1CH,241,NEU,V
HYDSPD0020	5P, 8WE ,1CH,241,NEU,V
HYDSPD0021	5P, 10WE ,1CH,241,NEU,V

8 Product Systems

HYDSPD0037	8P, 4WE ,1CH,241,NEU,V
HYDSPD0022	8P, 6WE ,1CH,241,NEU,V
HYDSPD0024	8P, 8WE ,1CH,241,NEU,V
HYDSPD0026	8P, 10WE ,1CH,241,NEU,V

Multi-Washer 10000 with Pneumatic Pump, **2-Channel**

8 Product Systems

HYDSPD0038	8P, 4WE ,2CH,241,NEU,V
HYDSPD0023	8P, 6WE ,2CH,241,NEU,V
HYDSPD0025	8P, 8WE ,2CH,241,NEU,V
HYDSPD0027	8P, 10WE ,2CH,241,NEU,V

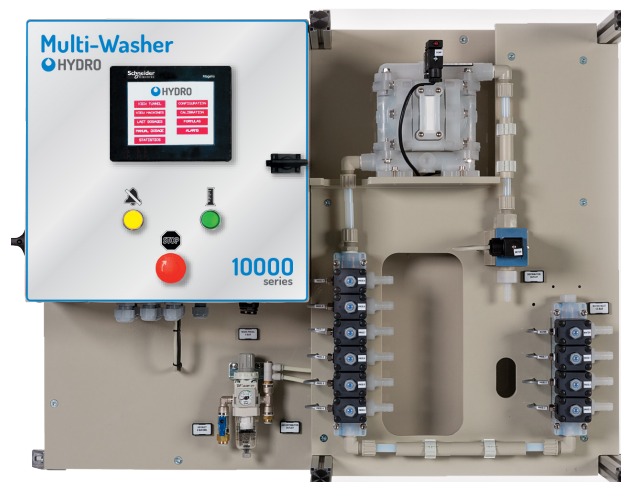
10 Product Systems

HYDSPD0039	10P, 4WE ,2CH,241,NEU,V
HYDSPD0028	10P, 6WE ,2CH,241,NEU,V
HYDSPD0029	10P, 8WE ,2CH,241,NEU,V
HYDSPD0030	10P, 10WE ,2CH,241,NEU,V

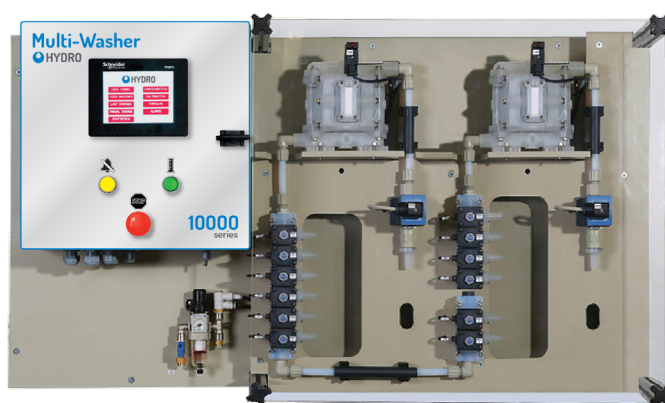
A key feature to these systems is delivering up to 10 chemicals to up to 10 washers with durable, pneumatic, double-diaphragm pumps.

Aiding in the reliability and longevity of the system is a water flush that cleans the entire channel after every product delivery.

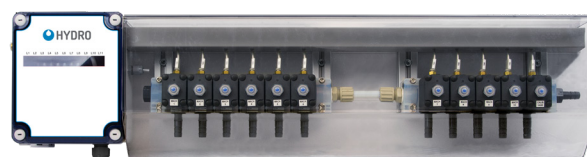
The collection manifold, both sides of the pump, the flow meter, and all the way through the distribution manifold to the washer is flushed with water, to prevent the effects of long-term chemical exposure.



Multi-Washer 10000 with Pneumatic Pump (1-Channel)*



Multi-Washer 10000 with Pneumatic Pump (2-Channel)*



Dositec Distributor (10 Washer)*

* Collector and Distributor Valve blocks could be Pneumatic (air) or Electro-mechanic (24Vdc) operated

1.00 overview

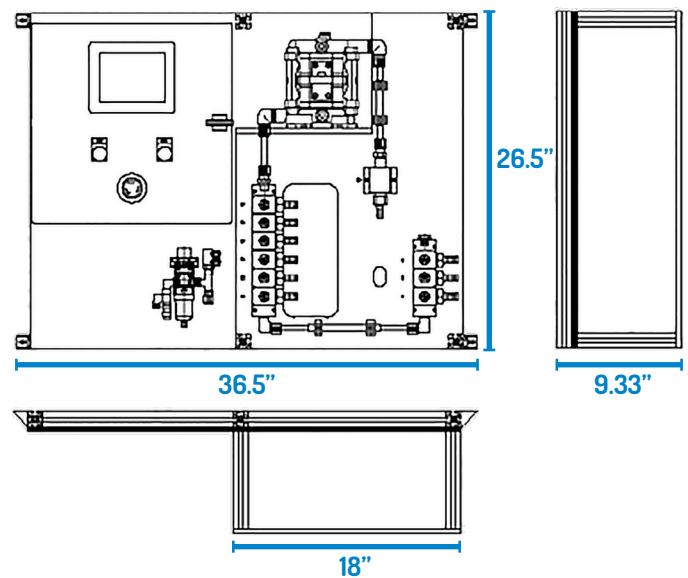
1.04 Dimensions

1-Channel Panel Dimensions

Panel Height: 26.5 in (670 mm)

Panel Width: 36.5 in (925 mm)

Panel Depth: 9.33 in (237 mm)

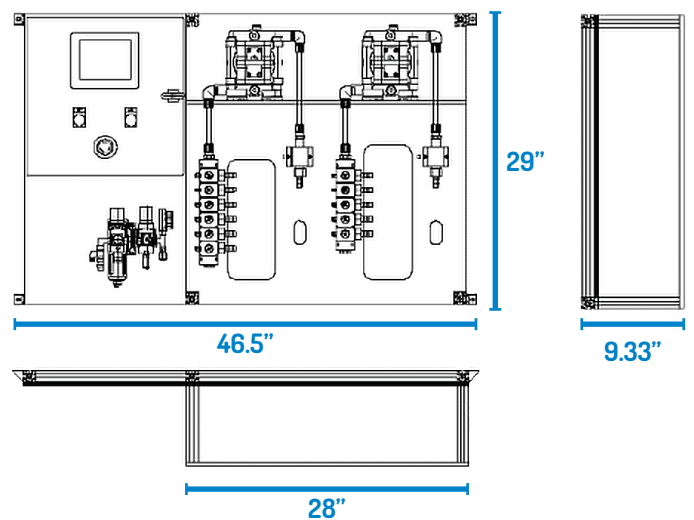


2-Channel Panel Dimensions

Panel Height: 29 in (737 mm)

Panel Width: 46.5 in (1180 mm)

Panel Depth: 9.33 in (237 mm)



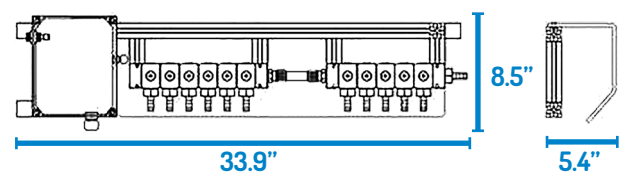
Distributor Dimensions

(10 washer model shown, width varies by model)

Distributor Height: 8.5 in (215 mm)

Distributor Width: 33.9 in (860 mm)

Distributor Depth: 5.4 in (138mm)



2.00 installation

2.01 Preliminary Tasks

It is highly recommended to visit the site well before installation, to familiarize yourself with the physical layout of the laundry, the machines present and their characteristics, the laundry products in use, and how any current laundry dosing system is being employed.

Pay attention to the entire laundry system, its requirements and its schedules, to ensure a smooth transition to, and installation of, your Multi-Washer system.

Learn the operations of all the washers, as well as the products they use, and why. Determine the capacities of the machines and what is involved in programming their signals.

Measure the distance between where the main panel will be installed and the location of the Distribution Manifold(s). Determine where the communication boxes will be installed for each washer, as well as the lengths of 4-conductor cable needed to daisy-chain them back to the main panel, and the lengths of 10-conductor cable from each communication box to each washer's signal terminals. Identify the voltage each washer is using for its signals. Determine how many conductors you need for connecting the main panel and the distribution manifold(s) and the distance for that connection.

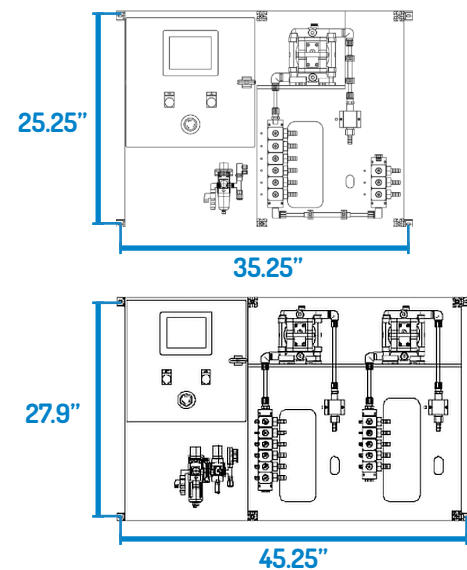
Measure the lengths of chemical delivery hose that will be needed to run from the main panel to the distribution manifold(s), from the distribution manifold(s) to the washers, and back to the calibration vase. Identify how the hoses will be routed, and what hardware will be required to accomplish that scheme. Identify where the bulk chemicals will be placed and the lengths of hose needed to connect them to the collection manifold of the main panel. Calculate how many hose clamps will be necessary to complete the installation.

It is recommended to order the specific installation kit for the system being installed, which is available from Hydro Systems. If the mounting hardware is obtained from local providers, all items should be the same as the ones listed in the kit.

Schedule an orderly transition from any previous dosing system in use, and investigate if any portions of that system must be removed before the installation of the Multi-Washer system. In case a previous unit is already working in the site, all the existing elements must never interfere with the new installation.

2.02 Panel Mounting

- In order to make the unit work correctly, it must be placed on a clear and flat wall.
- The system must be placed at such a height that the screen can be easily manipulated.
- The unit is mounted with four corner brackets that are **approximately** 25.25 in by 35.25 in (642 mm by 895 mm) for a 1-Channel unit or 27.9 in by 45.25 in (709 mm by 1150 mm) for a 2-Channel unit, but may vary slightly, so use the actual panel being installed as a template. For the supplied mounting hardware, drill four 5/16" (8 mm) holes at indicated locations.
- Insert the included fittings.
- Place the unit on the wall and use the included screws and mounting hardware to hang the system.



Approximate Dimensions for Mounting Brackets

2.03 Peripheral Elements

After placing the unit, it is necessary to mount the rest of the elements:

Distributor: This element is the responsible for diverting the products to the corresponding washer extractor. Only one machine is attended while the others are queued. It is recommended to set the distributor at a position equidistant from the washer extractors.

Calibration Vase: Since this vase is used for dosage calibration, it should be installed on the wall near the main panel. Please note the vase is connected by a hose to the distribution manifold. Make provision for draining the calibration vase and for overflow from the vent fitting.

Communication Boxes (machine signal interfaces): These elements are used to get the signals from the machines to the dispenser controller. There must be one box per washer extractor. The recommended position is a clear place on the wall behind every machine.

2.00 installation (continued)

2.04 Tubing

With all the components mounted, they can be connected with the delivery hoses. A flexible, reinforced, transparent, chemically-compatible hose of the proper inside diameter is recommended. The delivery hose connections are 1/2" barb and must be secured with worm-gear hose clamps. Check the fittings on the washers and the chemical drum pickup systems, in case an adapter will be required.

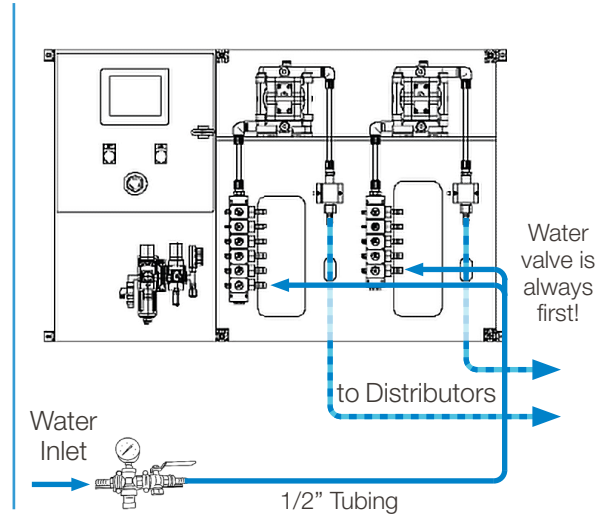
Water Inlet

The product delivery system will require **water flow of about 1 to 2 gallons per minute (gpm)** at a dynamic (valves open) **water pressure of 20 to 30 psi (1.5 to 2 bar)**. Do not use a source that feeds other devices, if during the feed the flow or pressure drops below these requirements.

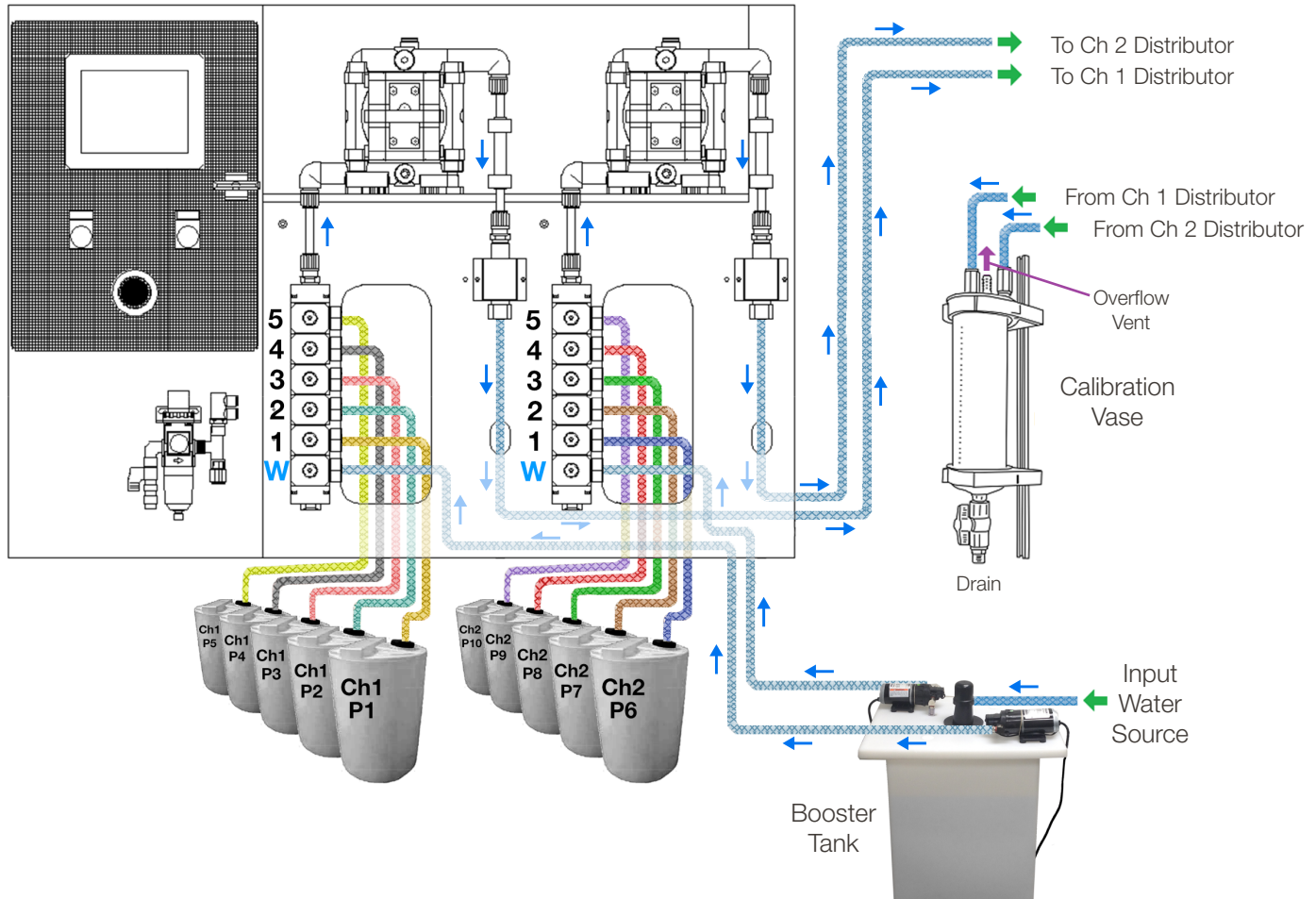
Water of a higher pressure will require a pressure regulator before the connection to the Multi-Washer system. If necessary, install the appropriate Hydro Systems Booster Tank to supply water at the proper flow and pressure.

Chemical Pickup

These are the hoses that connect the chemical drum pickup system to the Collection Manifold on the main panel. They allow product to be drawn into the delivery channel by the pneumatic pump during the dosage cycle. Consider how you want the chemical drums positioned to avoid having incompatible chemicals too close together, and to allow a neat routing of the hoses to the collection manifold on the main panel. Notice the water inlet is always the "first" valve (in the direction of flow) on each collection manifold. Also notice how the products are numbered and connected, starting next to the water, then progressing in the direction of the flow.



NOTE: 2-Channel images are shown. 1-Channel systems use the same setup, but with only a single dosing channel to connect.



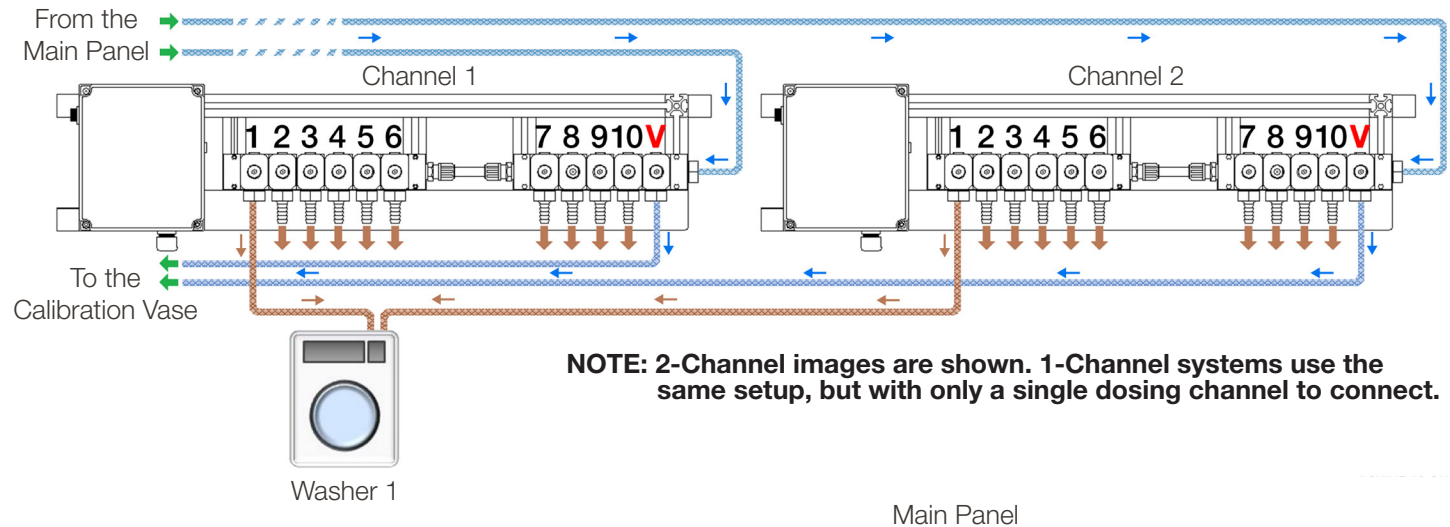
2.00 installation (continued)

2.04 Tubing (continued)

Distribution Manifold Hoses

The product delivery hose from each channel on the Main Panel runs to its own Distribution Manifold.

Then, from each distribution manifold, there is a hose that runs to each washer, and a hose that runs back to the Calibration Vase (which should be mounted near the main panel). The Calibration Vase solenoid will always be the rightmost and the washer solenoids numbering will always start at the left, as shown below. Some washers have two inputs, or you can “T” the dosage hoses that come from each channel, at the washer.



High Pressure Air Connection

Make sure there is sufficient air pressure, more than 60 psi or 4 bar, but not more than 120 psi or 8 bar.

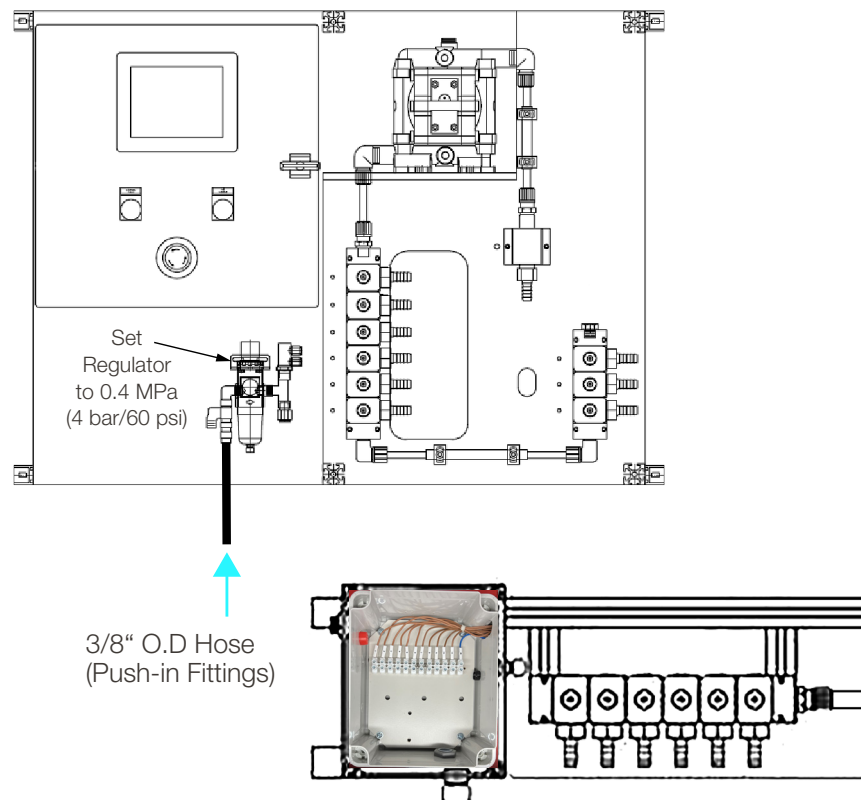
Air line coming into the main panel regulator must be a 3/8" (12mm) outside diameter plastic hose, and the fittings are a “push-in” design with no tools required.

“Push twice” to get the hose past the sealing O-ring and the grip ring.

To remove a hose from these fittings, push the external ring toward the fitting to release the hose so it can be pulled out.

These fittings seal best when the hose goes “straight in”, not pulled at an angle.

Once the main inlet is connected to the unit, **set the regulator on the main panel to 60 psi** or 4 bar.



2.00 installation (continued)

2.04 Tubing (continued)

Optional Air-Assist Flush

There are generally three reasons you might consider employing the optional Air-Assist Flush Panel:

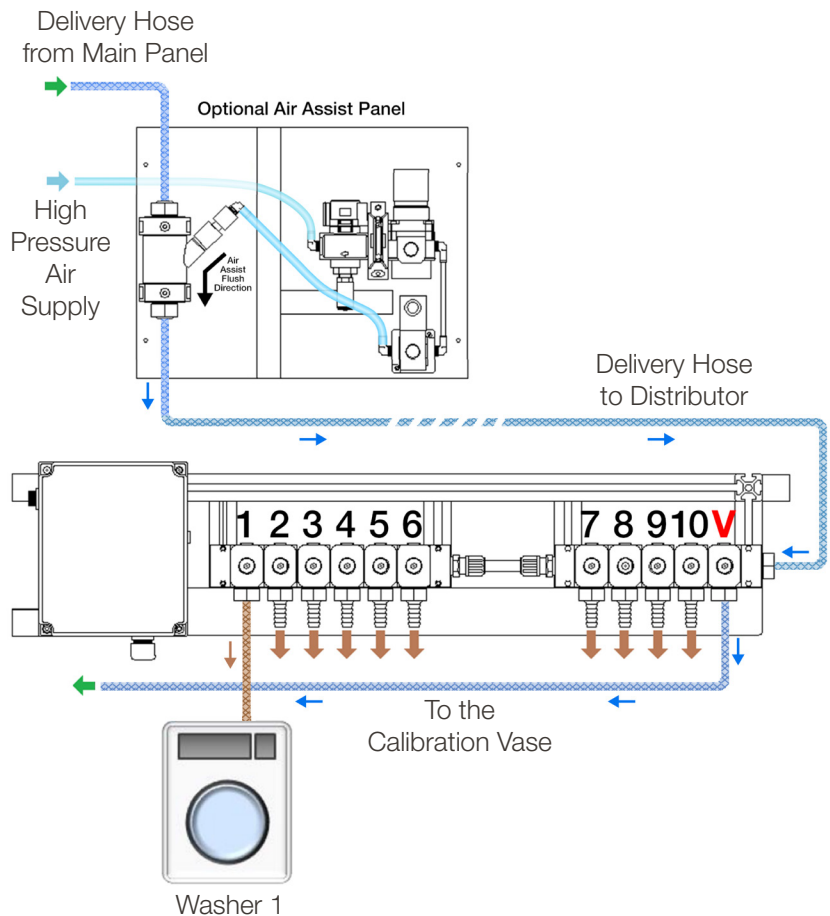
- 1) A long distance to some or all of the washers (over 100 feet / 30 meters).
- 2) Large dosage volumes of product to be delivered.
- 3) When you have short duration washer cycles.

The advantage of the air-assist flush is a much faster delivery than the water flush.

The compressed air will push the product dosage to the washer very quickly and also introduce much less water into the washer than would the normal water flush.

The set up is shown to the right with one distributor, but it would be the same for both channels.

The high pressure air supply should be independent; do not use the pre-regulated pressurized air supply from the main panel.



2.05 Electrical Connections (Main Power & Input / Output / Communications Connections)



Note: Do not power up the unit until ALL input, output and communications connections are connected.

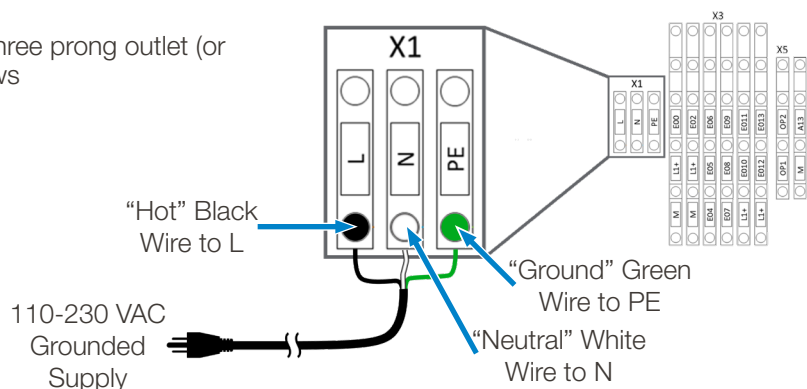
Input: Main Power Connection

The 110 - 230VAC power input must be an independent 3 wire supply and a dedicated 10-amp breaker is recommended. Never use a washer as the source for the input power supply.

The power cord must be plugged into a grounded three prong outlet (or equivalent) using all three wires on Bank X1 as follows

- Phase – 'L' connector. (Black wire in U.S.)
- Neutral – 'N' connector. (White wire in U.S.)
- Ground – 'PE' connector (Green wire in U.S.)

- 1) Black Wire to L
- 2) White Wire to N
- 3) Green Wire to PE



2.00 installation (continued)

2.05 Electrical Connections (continued)

Input: Air Pressure Sensor Connections

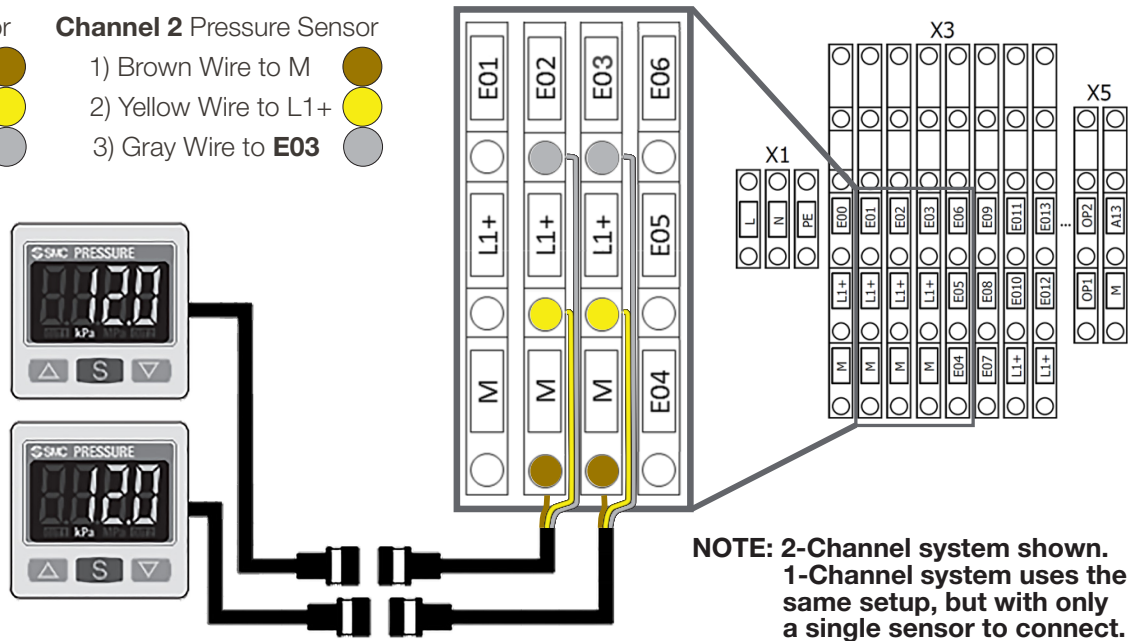
If your system includes the optional Air Assist Flush feature, you must connect the Air Pressure Sensors to the main panel on Bank X3. The Channel 1 sensor at M, L1+ and E02, and the Channel 2 sensor at M, L1+ and E03 as shown below. **Remove the jumper wires from L1+ to E02 and from L1+ to E03.** If the Air Pressure sensors are not being connected, those jumper wires must be in place or the system will go into alarm when the air pressure test is performed.

Channel 1 Pressure Sensor

- 1) Brown Wire to M
- 2) Yellow Wire to L1+
- 3) Gray Wire to E02

Channel 2 Pressure Sensor

- 1) Brown Wire to M
- 2) Yellow Wire to L1+
- 3) Gray Wire to E03



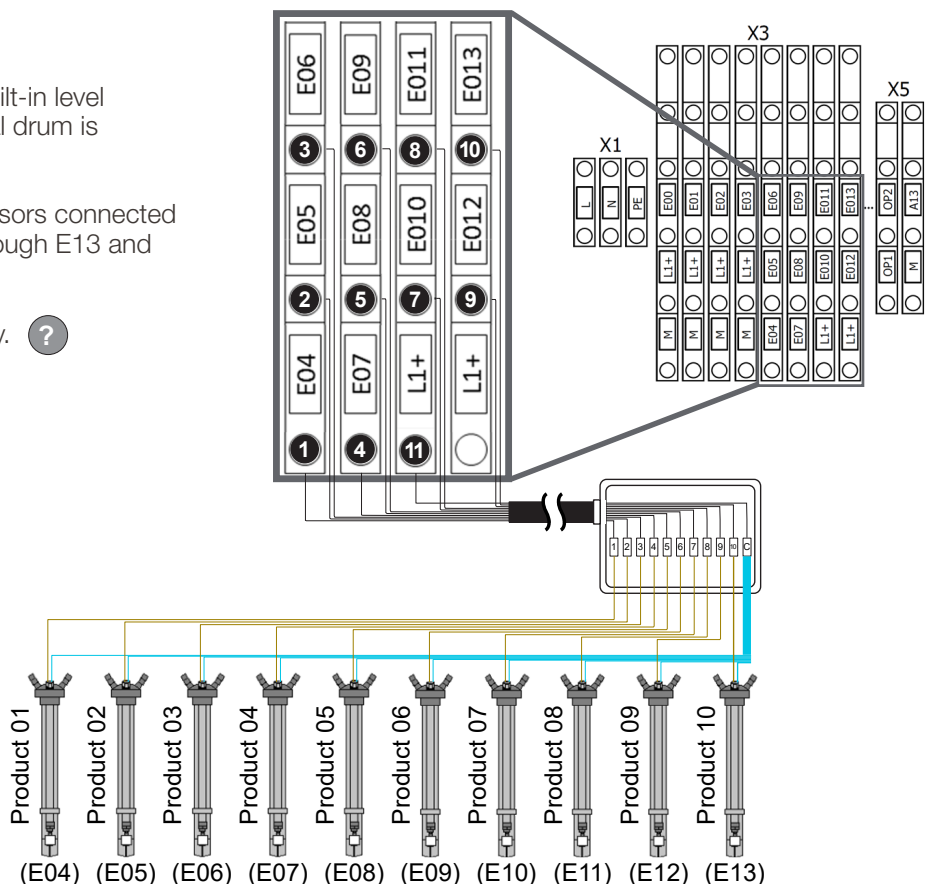
Input: Drum Level Sensor Connection

The Dositec Product Drum Lances have a built-in level sensor that can tell the system if the chemical drum is empty.

You can have as many as ten of the level sensors connected to the main panel, on Bank X3 using E04 through E13 and L1+ for the common ground connection.

Wire supplied by installer, colors may vary. ?

- Wire 1) Product 01 connects to E04
- Wire 2) Product 02 connects to E05
- Wire 3) Product 03 connects to E06
- Wire 4) Product 04 connects to E07
- Wire 5) Product 05 connects to E08
- Wire 6) Product 06 connects to E09
- Wire 7) Product 07 connects to E10
- Wire 8) Product 08 connects to E11
- Wire 9) Product 09 connects to E12
- Wire 10) Product 10 connects to E13
- Wire 11) **Common ground always connects to L1+**



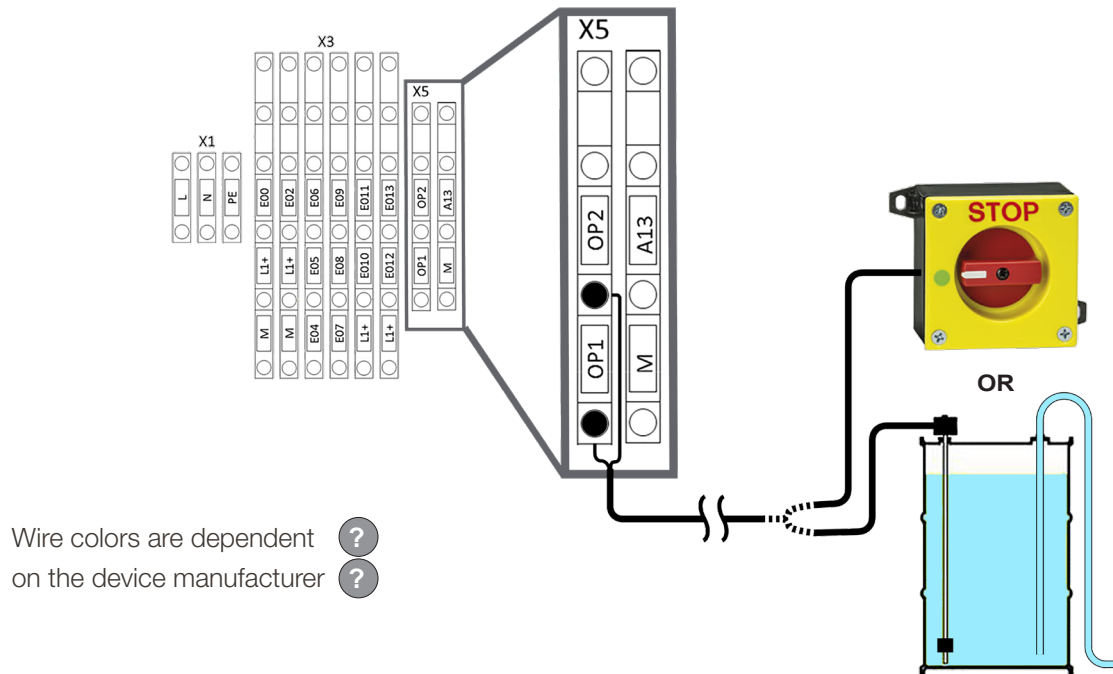
2.00 installation (continued)

2.05 Electrical Connections (continued)

Input: External Emergency Stop Connection

The contacts OP1 and OP2 on Bank X5 are configured for an External Emergency Stop function. It is a simple two-wire resistance circuit, like a switch. When the circuit is closed (low resistance/continuity) the system operates normally. When the circuit is open (high resistance/no continuity) the system will perform an Emergency Stop.

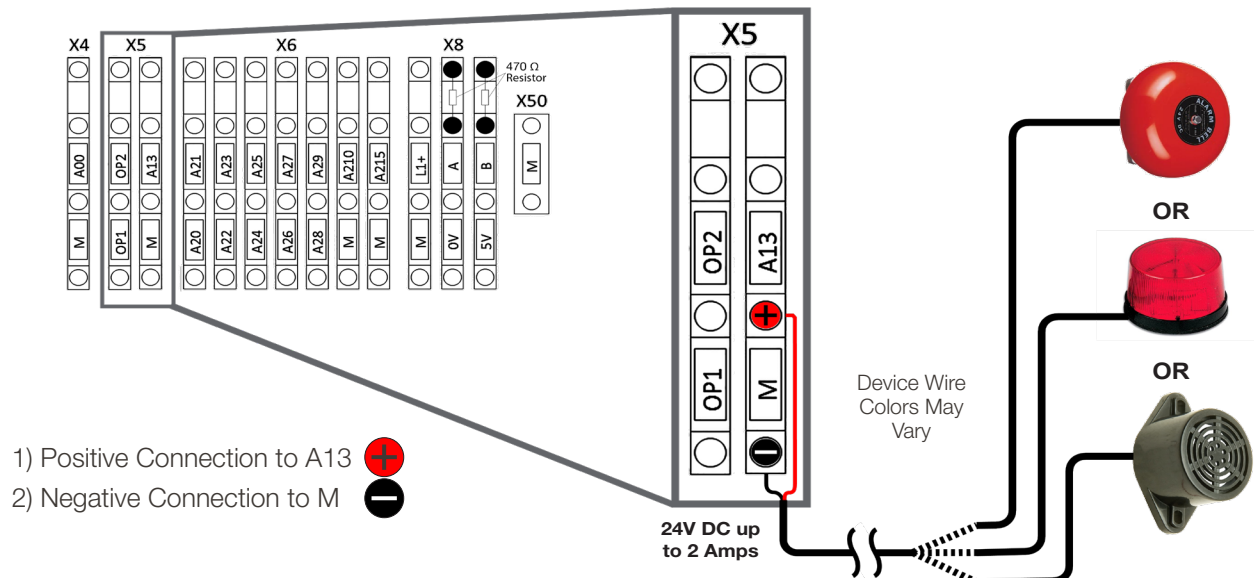
There is normally a jumper/bridge wire between OP1 and OP2 so the system will operate normally without an External Emergency Stop device. **Remove** the jumper/bridge wire when using these connections.



Output: External Alarm Indicator Connection

The Multi-Washer's main panel has a built-in alarm buzzer that is quite loud with a piercing sound, but it also has two contacts on Bank X5, at A13 and M, that are designed to energize an additional, external alarm indicator.

The contacts are configured to supply **24 Volts DC, at up to 2 amps**, to energize an external alarm indicator, like a strobe, buzzer or bell.



2.00 installation (continued)

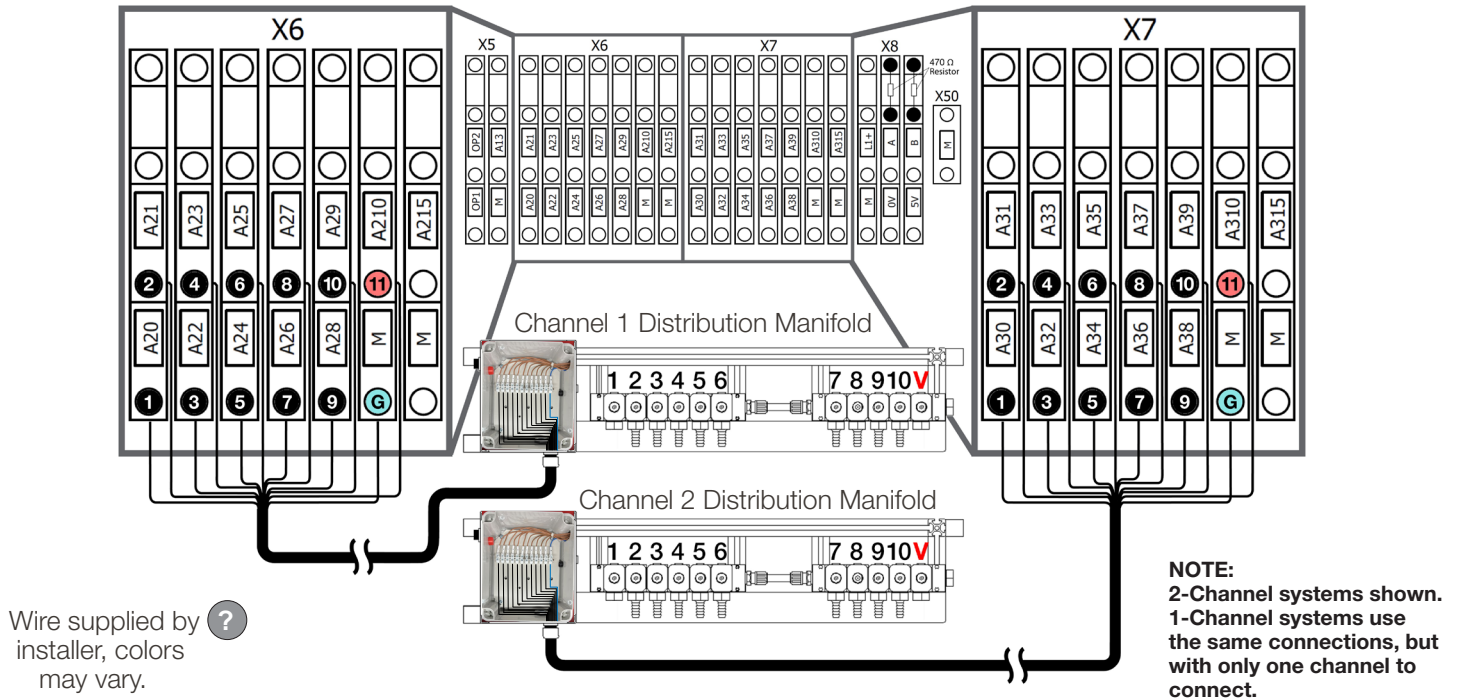
2.05 Electrical Connections (continued)

Output: Distribution Manifold Solenoid Connection

The PLC controls the solenoids in the Distribution Manifolds through connections made on Bank X6 and X7. Channel 1 uses A20 through A29 for chemical delivery, A210 for the Calibration Vase, and M as the common ground. Channel 2 uses A30 through A39 for chemical delivery, A310 for the Calibration Vase, and M as the common ground.

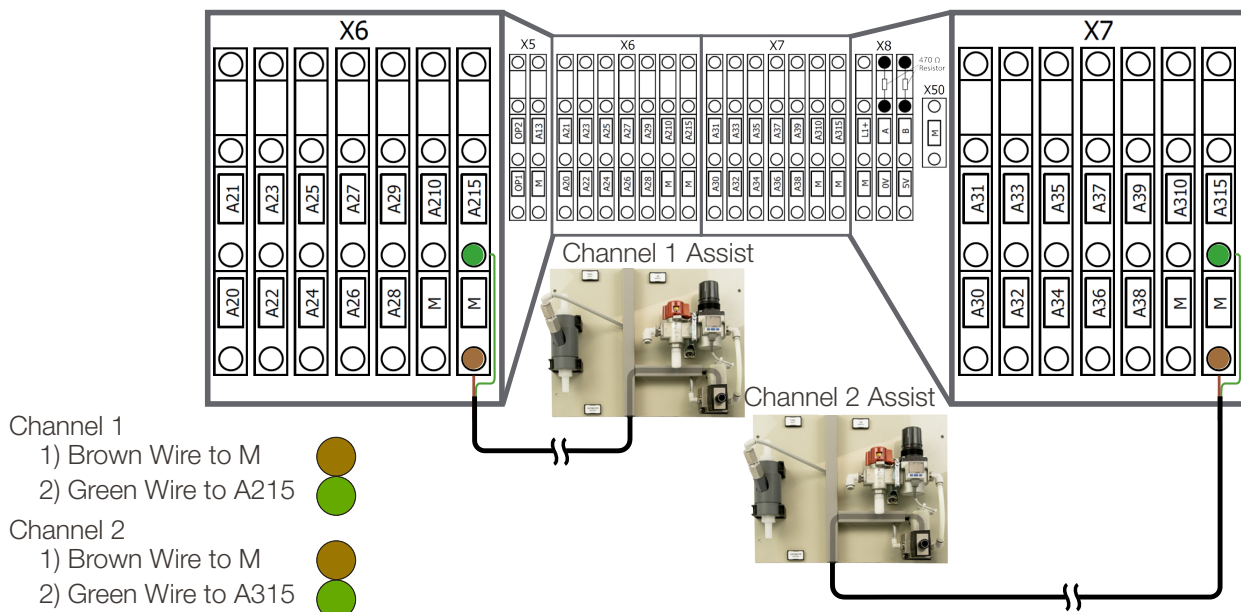
Note: The connector in the distribution manifold for the calibration vase solenoid **is always marked "11"**, even if less than ten washers are being serviced.

Note: The single color wire, marked 'M' is the common Ground.



Output: Air Assist Flush Connection

The optional Air Assist Flush system (if present) is controlled by the PLC using connections on Bank X6 and Bank X7. Channel 1 uses A215 and M, while Channel 2 uses A315 and M, as shown below.



2.00 installation (continued)

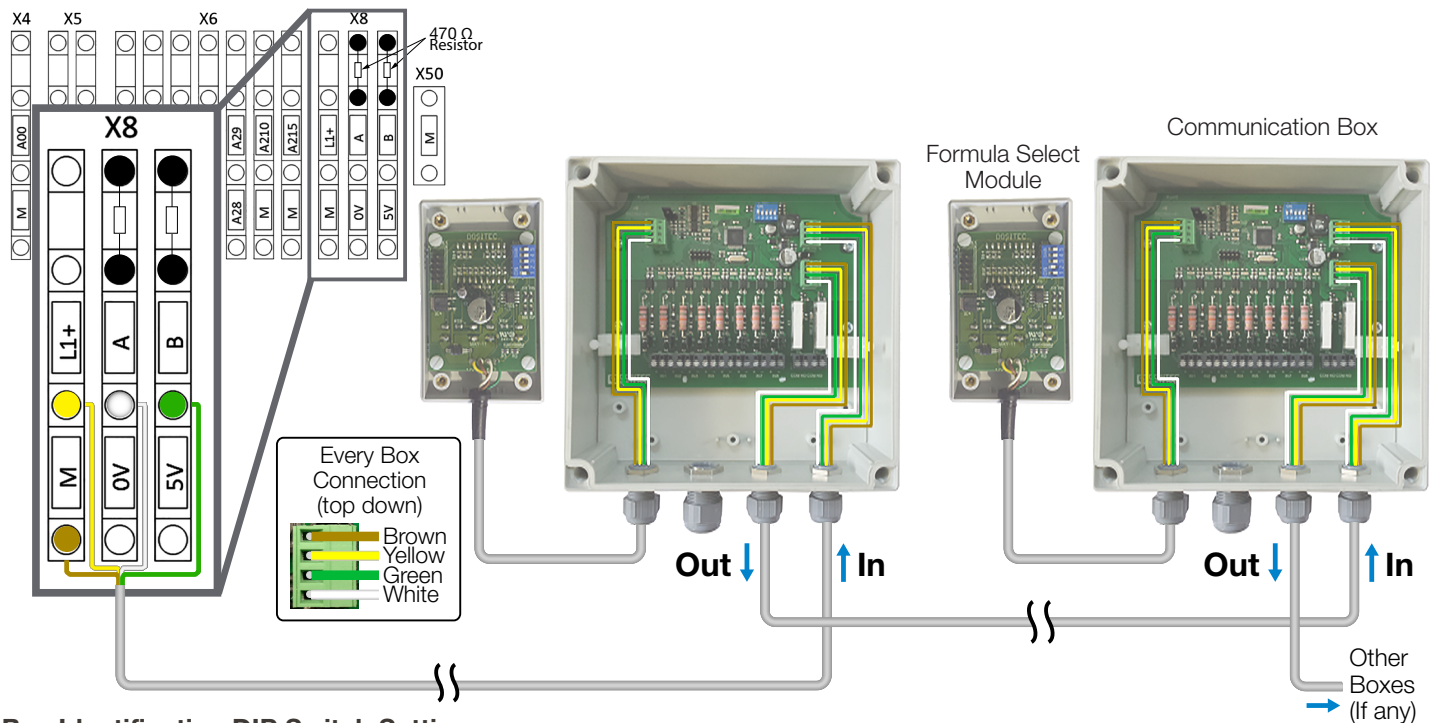
2.05 Electrical Connections (continued)

Communication: Machine Communication Boxes

The Multi-Washer's Communication Boxes are the interface between the signals coming from the washer and the formula programming to deliver certain products at certain times. The simple On/Off signals from the washer are translated into digital packets of information and transmitted back to the PLC over a digital network. This allows a single four-wire cable to daisy-chain from one communication box to another, which greatly simplifies installation.

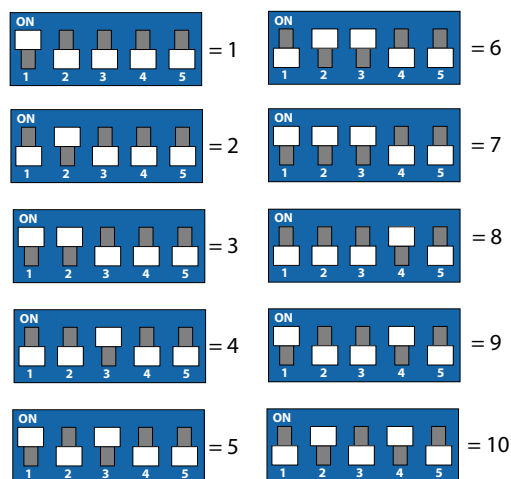
Wiring

The connection at the main panel is on Bank X8 at L1+, M, A and B as shown below. The four conductor cable runs to the "In" connector of the box closest to the main panel. Any remaining boxes are connected with a cable running from the "Out" connector to the "In" connector of the next box.

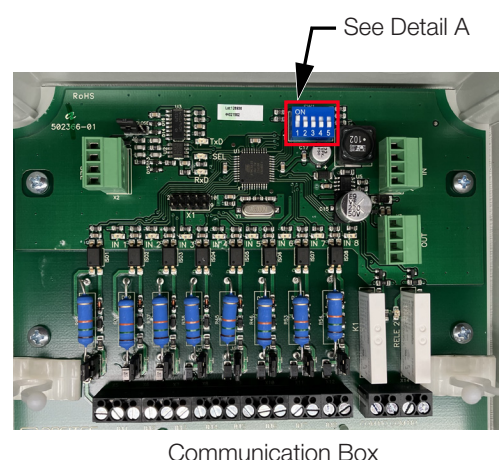
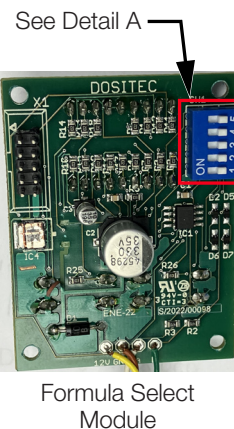


Box Identification DIP Switch Settings

The boxes are identified to the PLC by the DIP switch settings as shown below. If you are using the Remote Formula Selection accessory, their DIP switches must be set to match the Communication Box to which they are connected.



Detail A

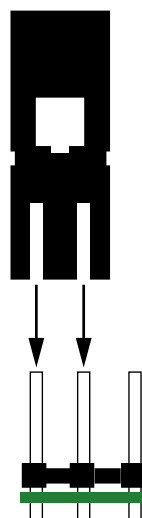
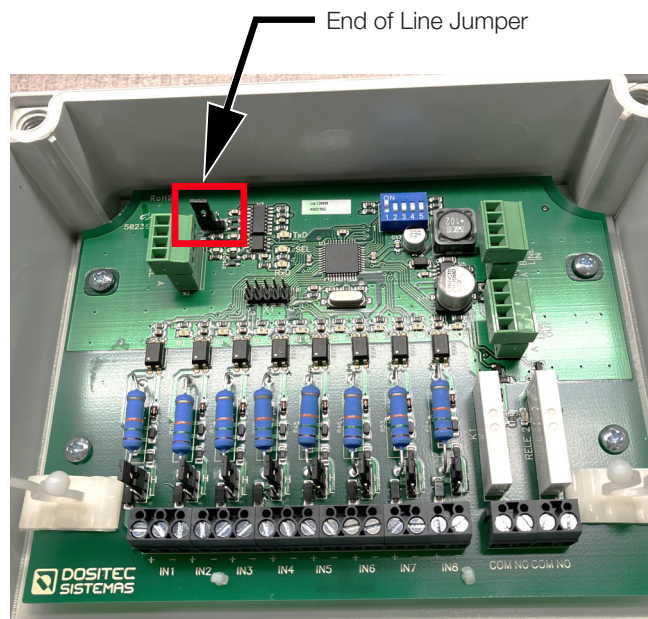


2.00 installation (continued)

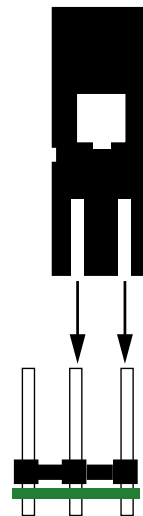
2.05 Electrical Connections (continued)

End of Line Jumper

The End of Line Jumper must be in the left position for the all the communication boxes, except for the last one, which must be in the right position. The last communication box usually connects the last washer.



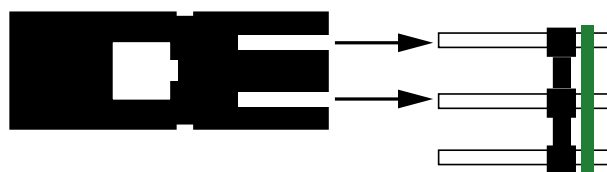
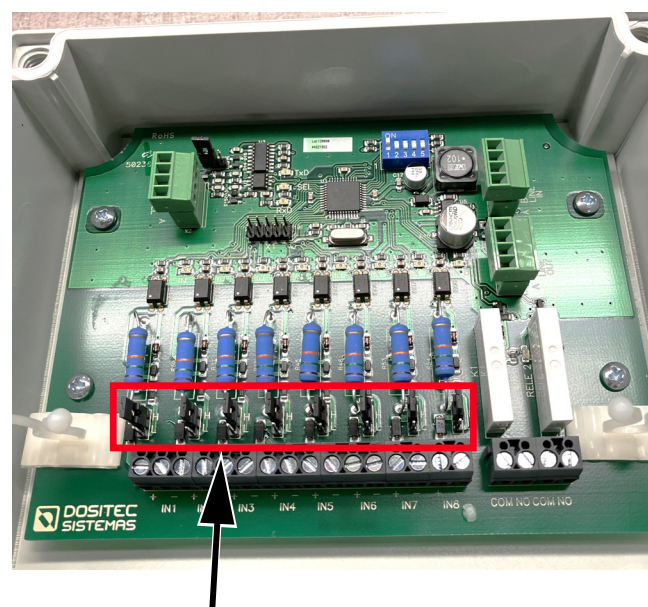
The jumper in this left position means communication box is connected to the washer that is NOT the last one.



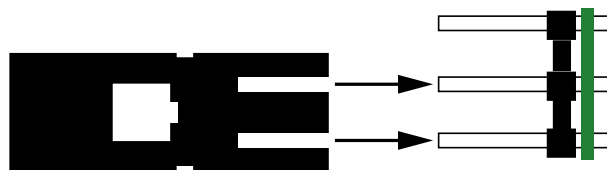
The jumper in this right position means communication box is connected to the last washer.

Filter Voltage Input Jumpers

The Communication Box is capable of receiving signal voltage from 18 V to 230 V. There is a jumper for each signal. They are placed between the resistors and the terminals of the inputs.



The jumper in the H (High) position means that the input voltage signals is between 80V - 230V.



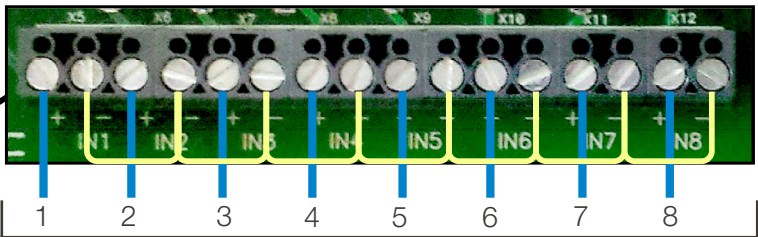
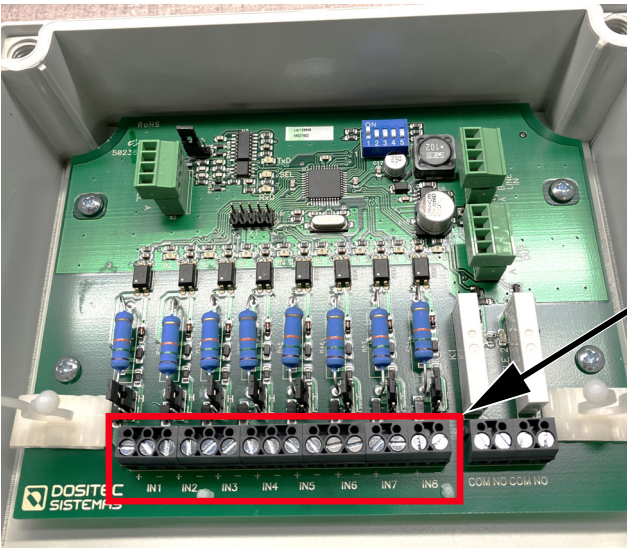
The jumpers in the L (Low) position means that the input voltage signal is between 18V - 80V.

2.00 installation (continued)

2.05 Electrical Connections (continued)

Communication: Machine Signals

The signal wires from each washer connect to their respective Communications Box using the row of connectors at the lower edge of the circuit board, with the grounds jumpered to have a common connection, as shown below.



Washer Signal Wires (Installer supplied wiring color will vary)

Communication: DIP Switch 5 - Auto-Formula Select Time

On the DIP switch that identifies the Communications Box (see above), **the fifth DIP switch is used to adjust the time period** for Auto-Formula Select (AFS).

With switch 5 in the **Off position, 5 seconds** is the AFS time, so an AFS signal of 15 seconds would select Formula 3. With switch 5 in the **On position, 3 seconds** is the AFS time, so an AFS signal of 9 seconds would select Formula 3.

There are 6 possible **ID Modes** of identifying a new incoming formula according to the possibilities of the signals. Please check with your washer providers to decide which ID Mode to use.

*** Note all examples used below are with the 5sec setting (Switch 5 OFF) and times shown would be different if Switch 5 was ON (3 secs).**

ID Mode 1: Time of signal 6

Every time signal 6 is received, the unit starts a new process. The formula number is determined by the time (in seconds) this signal remains active according to this table:

Formula	Time	Formula	Time	Formula	Time
1	5	7	35	13	65
2	10	8	40	14	70
3	15	9	45	15	75
4	20	10	50	16	80
5	25	11	55	17	85
6	30	12	60	18	90
				n	5 x n

Signal 6 cannot be used for dosing because it is already used for identification. Big formula numbers imply long times.

2.00 installation (continued)

2.05 Electrical Connections (continued)

ID Mode 2: Time of signals 1+5

Every time signals 1 and 5 are received **simultaneously**, the unit starts a new process. The formula number is determined by the time (in seconds) that these signals remain active according to this table:

N. For.	Time		N. For.	Time		N. For.	Time		N. For.	Time	
	S1	S5		S1	S5		S1	S5		S1	S5
1	10	5	11	15	5	21	20	5	31	25	5
2	10	10	12	15	10	22	20	10	32	25	10
3	10	15	13	15	15	23	20	15	33	25	15
4	10	20	14	15	20	24	20	20	34	25	20
5	10	25	15	15	25	25	20	25	35	25	25
6	10	30	16	15	30	26	20	30	36	25	30
7	10	35	17	15	35	27	20	35	37	25	35
8	10	40	18	15	40	28	20	40	38	25	40
9	10	45	19	15	45	29	20	45	39	25	45
10	Forbidden		20	Forbidden		30	Forbidden		40	Forbidden	

Both signals 1 and 5 are available for later dosing as long as they are received independently. This mode is recommendable when the machine allows controlling the time of two signals.

The maximum time that this mode takes is 45 seconds (for programs ended in 9).

ID Mode 3: Pairs of signals

Every time **two simultaneous** signals are received, the unit starts a new process. The formula number is given by the table below:

Formula	Signals	Formula	Signals	Formula	Signals
1	1+2	11	3+5	21	6+7
2	1+3	12	3+6	22	1+8
3	1+4	13	4+5	23	2+8
4	1+5	14	4+6	24	3+8
5	1+6	15	5+6	25	4+8
6	2+3	16	1+7	26	5+8
7	2+4	17	2+7	27	6+8
8	2+5	18	3+7	28	7+8
9	2+6	19	4+7	29	Forbidden
10	3+4	20	5+7	30	Forbidden

In this mode, no time control is needed. It is recommendable when the machine allows sending two simultaneous signals without the possibility to control their time. All signals are available after identification as long as they are received independently.

2.00 installation (continued)

2.05 Electrical Connections (continued)

ID Mode 4: Formula selector

This is a non-automatic way of identification. It is recommended when there is no possibility to control the signals of the washer extractor. By using the UP/DOWN buttons, it is possible to set the formula number. When the end of the cycle is reached (reset), the formula selector shows '00'.

ID Mode 5: Signal = Formula

Every time signal 6 is received, the unit gets ready to identify the new formula number. After this, the following incoming signal will determine the number of formula (no dosage will occur). The next time any signal comes (except from 6); the dosage associated to it will begin. This means we have a maximum of 7 formulas since the signal board has 8 inputs. Formula 6 is not available.

ID Mode 6: Binary

In this mode, the machine sends any combination of signals between 1 and 5. Signal 6 must be also sent simultaneously with this combination. The combination of signals defines a number in binary code. Signal number 6 tells the unit to begin a new formula whose number is the one defined by the combination. All the signals must take the same time, which must be greater than the acceptance time defined earlier.

Formula	Signals						Formula	Signals					
	1	2	3	4	5	6		1	2	3	4	5	6
1							17						
2							18						
3							19						
4							20						
5							21						
6							22						
7							23						
8							24						
9							25						
10							26						
11							27						
12							28						
13							29						
14							30						
15							31						
16							32	Forbidden					

The table shows the correspondence between the formula number and the signals received (solid squares).

This means that the program in the washer extractor must begin with a previous phase where the identification is carried out.

This phase can also be used to get some water level.

Once the formula is established, the next phases can contain the signals for the dosing orders

2.00 installation (continued)

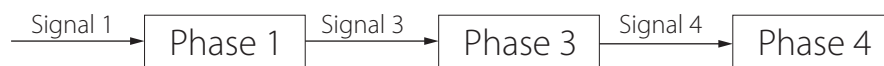
2.05 Electrical Connections (continued)

There are 4 possible **Working Modes** of dosing. They determine how the unit executes the dosage in every phase defined in the formula according to the reception of signals. Please check with your washer providers to decide which mode to select during programming.

Mode 1: 'Signal'

This is the most recommendable mode. We need the same number of available signals in the machine as dosing phases in the formula.

The unit will dose all the products involved in the phase which corresponds to the number of incoming signal. Once the products are dosed, the reception of the same signal number has no effect until the formula starts again. For this reason, all the phases are executed only once. See the example:

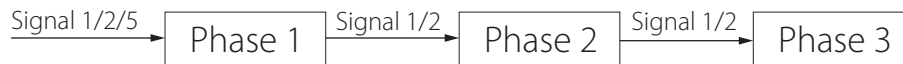


Mode 2 'Sequential'

The reception of either signal 1 or 2 makes the unit jump to the next dosing phase.

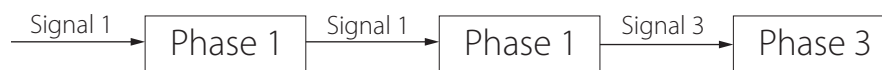
It is possible to leave phases without products in case we need to skip rinses. Just for the first phase, we can also use signal 5. (E.g. we can connect a filling valve to signal 5). In this way, we have one criterion for the formula start.

The reception of signal 5 after having executed the first phase has no effect. This mode is called 'drain' because we can always use the drain valve to advance every step in case there are no more signals available. The risk of using this mode is that the process in the machine must never be advanced manually due to synchronism with the unit would be lost. See the example:



Mode 3 'Signal + repetition'

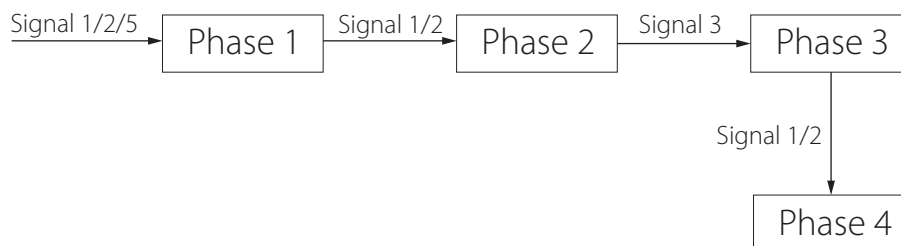
This mode works in the same mode as the first one. The only difference is that all the dosing phases are executed every time their corresponding signal is received. See the example:



Mode 3 'Signal + repetition'

Works like the sequential case with one exception: The progress from phase 2 to 3 can only be done with the reception of signal 3.

See a example:



3.00 system start-up

When you have finished the physical installation of the system, you can begin the start-up procedure, detailed below:

3.01 Configuring the System Settings

It is necessary to define all the parameters related to the unit, products, channels and washer extractors. Although you can do this at the front panel, it is easier to use Hydro Connect to configure the unit remotely from a PC.

3.02 Prime the Hoses that go to the Washer Extractors with Water

The hoses in the delivery channel and from the distribution manifold to the washers need to be filled with water. To do this, use the calibration screen and do successive 'Water' calibrations to each washer. Also fill the hose that comes back to the calibration vase by selecting it as the destination. Check for leaks before proceeding to the next step.

3.03 Prime the Suction Hoses of every Product

The hoses that run from product pick-up drum lances to the collection manifold on the main panel also need to be filled. Once again use the calibration function but this time select 'Product' as calibration mode. You can send the flow to a washer or the calibration vase, releasing the button to stop the dose as soon as the product hose is filled to the collection manifold. If you are sending the flow to the calibration vase, open the valve at the bottom of the vase.

After each calibration you will be required to run a flush to clean the delivery channel. If you are sending the flow to the calibration vase, watch out for an overflow when doing the flush. It is important to take into account the chemical incompatibilities when choosing the order of the products to prime. If the delivery channel or vase is not sufficiently cleaned by the flush, do a water calibration until you are satisfied.

3.04 Calibration of Products

Now that all the hoses are primed, you can do the product calibrations. Select the Product whose delivery you wish to calibrate in the calibration screen, and choose the calibration vase as the destination. Check that the valve at the bottom of the calibration vase is closed. Press and hold the calibration button while sending the dosage to the vase. Remember that the vase will begin to fill with water, not product, which is correct since the volume of water is the same as the volume of product being pulled from the collection manifold.

Release the button to stop the dose when there is a representative sample in the vase (use the average of the maximum and minimum dose for each chemical), check the volume scale on the side of the vase and enter the actual volume pumped on the PLC touchscreen in milliliters.

3.05 Calibration of Water

Although you could calibrate water delivery to the calibration vase, calibrating at the washer farthest from the main panel provides the worst case scenario for pumping against back pressure. Put a bucket or other container at the inlet hose for the washer, and hold the Calibration button down long enough to get a sizable volume delivered, like half a gallon (2 liters). Carefully measure the volume of water that was delivered and enter that volume in the Actual field for the calibration in milliliters.

3.06 Check the Dosage Calibration with Manual Dose

To verify the flow meter measurements, perform a manual dosage to the calibration vase, with the Flush option set to "No", and with the valve at the bottom of the vase closed. Then confirm the volume in the vase is the same as the manual dosage volume you entered on the PLC display. Since using the manual dose function to check the flow meter measurement must be done with the vase valve closed and without flush, you will have to open the vase valve and flush the delivery channel as a separate operation.

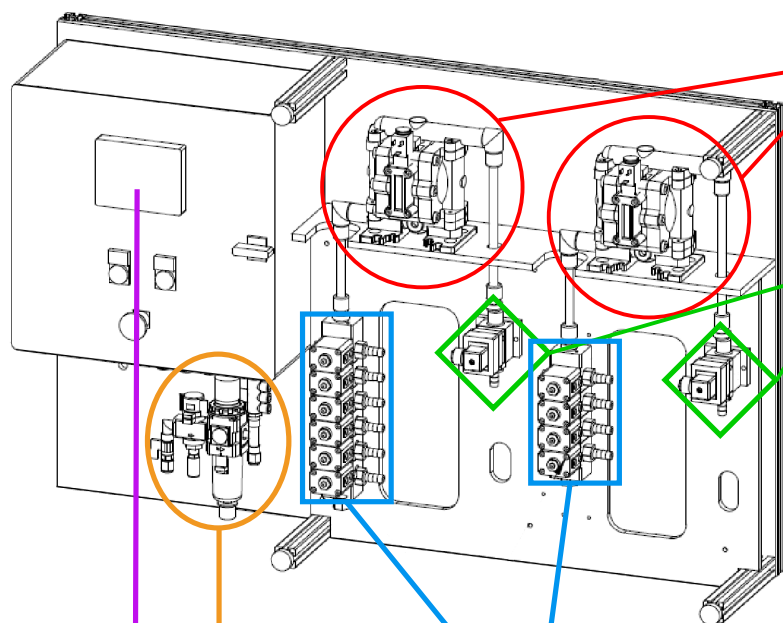
3.07 Adjusting Flush Time for Each Washer Extractor

Use the Manual Dose function (with the Flush Option set to "Yes") and send a dosage to each washer extractor. Choose a product with a noticeable color, so you can watch at the inlet of the washer extractor and see if the current flush volume is enough to take the full product dosage inside the washer. If the water flush volume needs to be adjusted, that is done on the "Parameters of Washer Extractors" screen.

3.08 Test the System

Run each washer one by one, and verify that the PLC is receiving all the washer's signals, and responding with the proper product delivery, based on the formula selected and the configuration for each wash phase. The number of the formula and the corresponding phases must be reflected in the "View machines" screen.

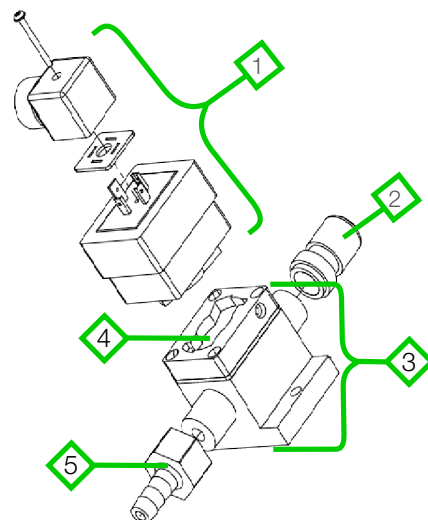
4.00 service parts



Replacement Pneumatic Pump HYD111310D4 (All-Flo) Assembly

NOTE: 2-Channel system shown. 1-Channel system uses the same parts, except as noted.

Flow Meter



	Pneumatic Solenoid Valve Blocks	Electro Magnetic Valve Blocks
2 Valve	HYD111712EST	N/A
3 Valve	HYD111713EST	HYD0217297301140
4 Valve	HYD111714EST	HYD0217297301141
5 Valve	HYD111715EST	HYD0217297301142
6 Valve	HYD111716EST	HYD0217297301143

Note: The Valve Block Type must match the Valve Block Switching Device (Refer Page 19.)

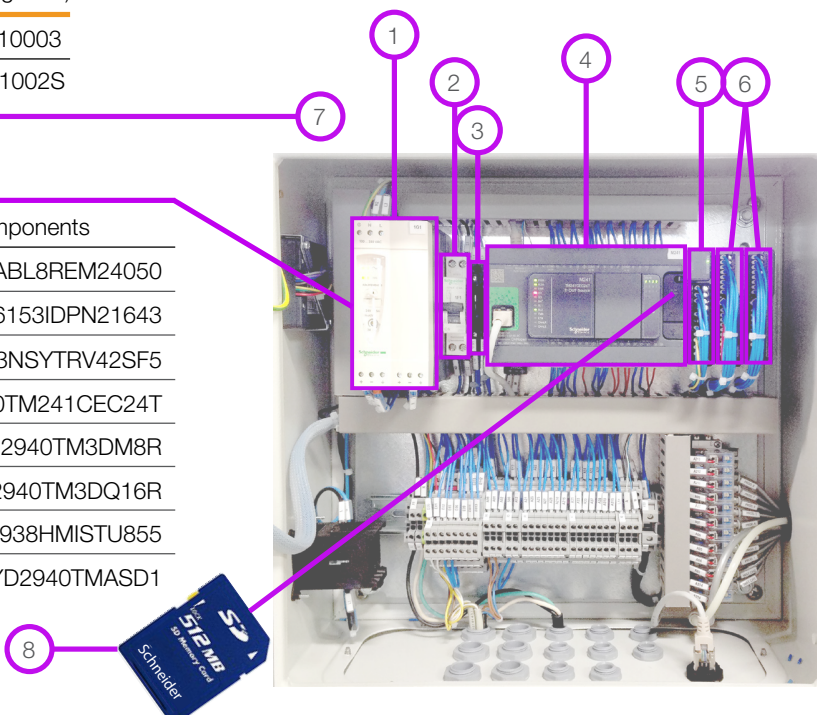
1	Kit, Flow Meter Sensor	HYD021713020002
2	Input Hose Fitting, 1/2"	HYD1318100FG4812PP
	Rigid PTFE Tube	HYD54808400299
3	Kit, Paddlewheel & Base	HYD0217297301490
4	Kit, PaddleWheel Only	HYD02171432300
5	Output Hose Barb, 1/2"	HYD54808400299

Assy, Air Regulator, 1 Channel HYD1117210003

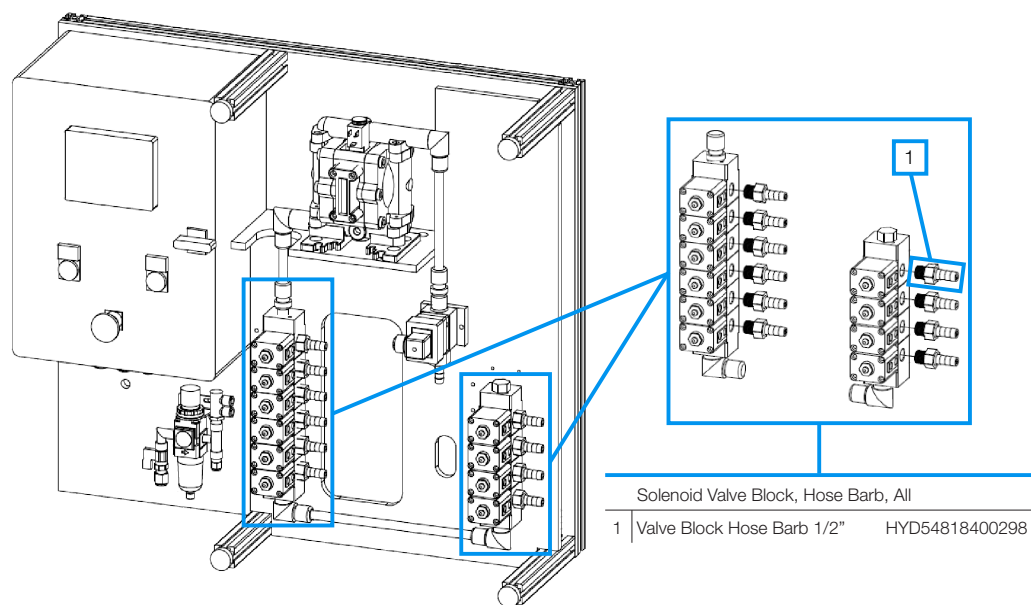
Assy, Air Regulator, 2 Channel HYD111721002S

M241 Pneumatic Wall-Mount Cabinet Components

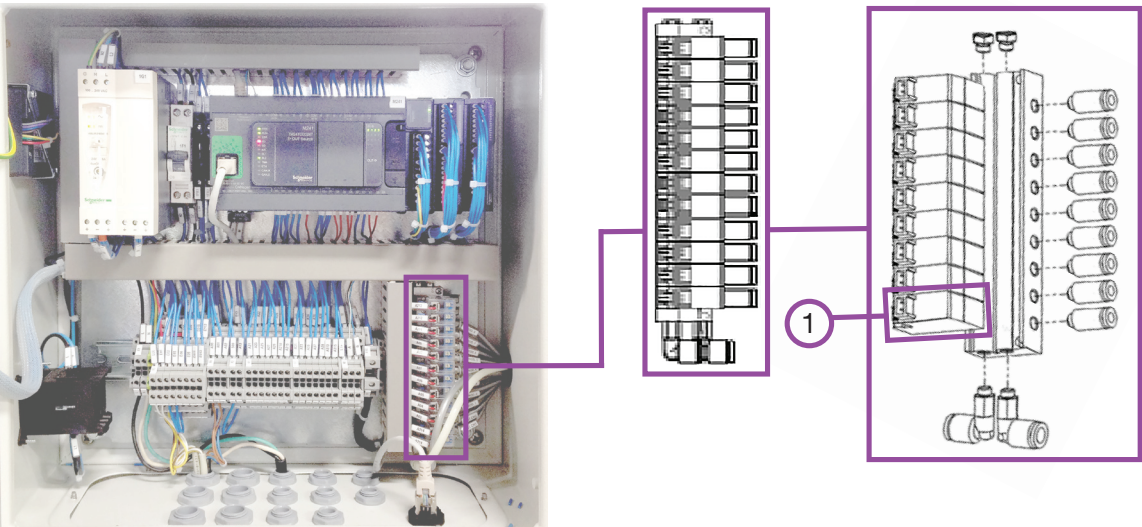
1	Power Supply - 24V 5A	HYD2940ABL8REM24050
2	Thermal Circuit Breaker	HYD6153IDPN21643
3	2-Fuse Block Connector	HYD2953NSYTRV42SF5
4	CPU - Model 241 PLC	HYD2940TM241CEC24T
5	4 Input / 4 Output Module	HYD2940TM3DM8R
6	16 Relay Output Modules	HYD2940TM3DQ16R
7	Color Touchscreen 5.7"	HYD2938HMISTU855
8	SD Memory 512MB for Schneider	HYD2940TMASD1



4.00 service parts (continued)



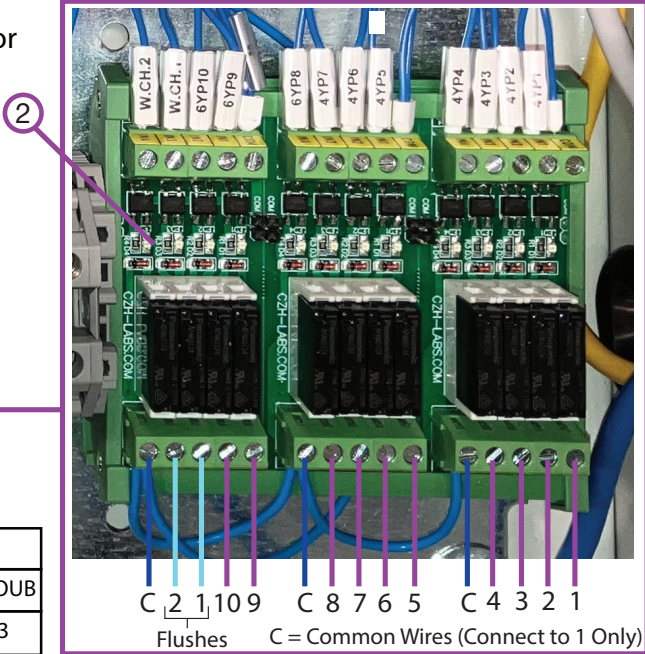
Pneumatic (Air) Operated Collector Valve Block



Electro-magnetic (24Vdc) Operated Collector Valve Block



Valve Block Switching Device		
1	Air Valve Coil - Pneumatic	HYD481715LOUB
2	Relay Board - Electro-Mechanical valve	HYD10100763



5.00 warranty

5.01 Limited Warranty

Seller warrants solely to **Buyer** the Products will be free from defects in material and workmanship under normal use and service for a period of one year from the date of completion of manufacture. This limited warranty does not apply to (a) hoses; (b) and products that have a normal life shorter than one year; or (c) failure in performance or damage caused by chemicals, abrasive materials, corrosion, lightning, improper voltage supply, physical abuse, mishandling or misapplication. In the event the Products are altered or repaired by **Buyer** without **Seller's** prior written approval, all warranties will be void.

No other warranty, oral, express or implied, including any warranty of merchantability or fitness for any particular purpose, is made for these products, and all other warranties are hereby expressly excluded.

Seller's sole obligation under this warranty will be, at **Seller's** option, to repair or replace F.O.B. **Seller's** facility in Cincinnati, Ohio any Products found to be other than as warranted.

5.02 Limitation of Liability

Seller's warranty obligations and **Buyer's** remedies are solely and exclusively as stated herein. **Seller** shall have no other liability, direct or indirect, of any kind, including liability for special, incidental, or consequential damages or for any other claims for damage or loss resulting from any cause whatsoever, whether based on negligence, strict liability, breach of contract or breach of warranty.



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