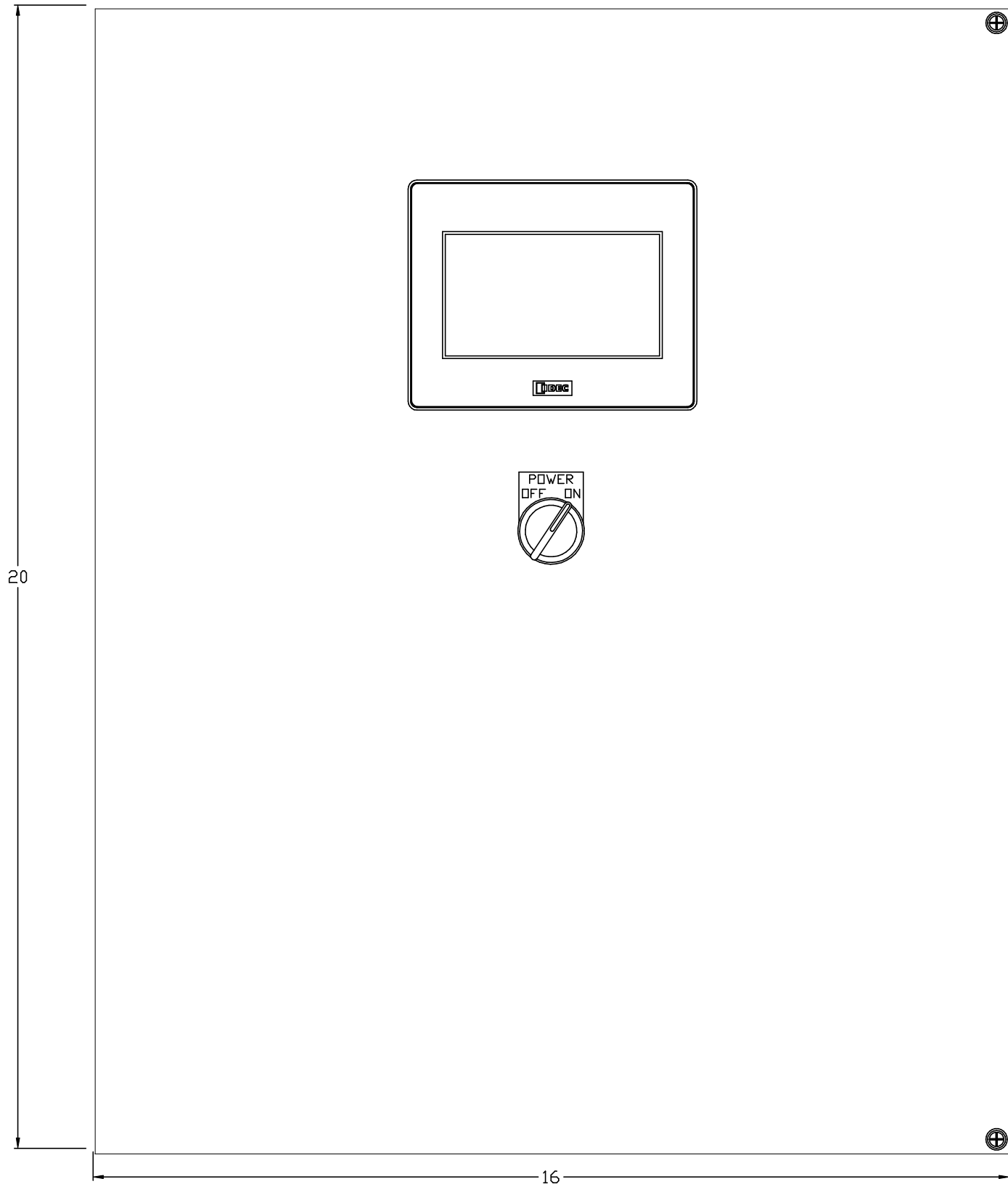


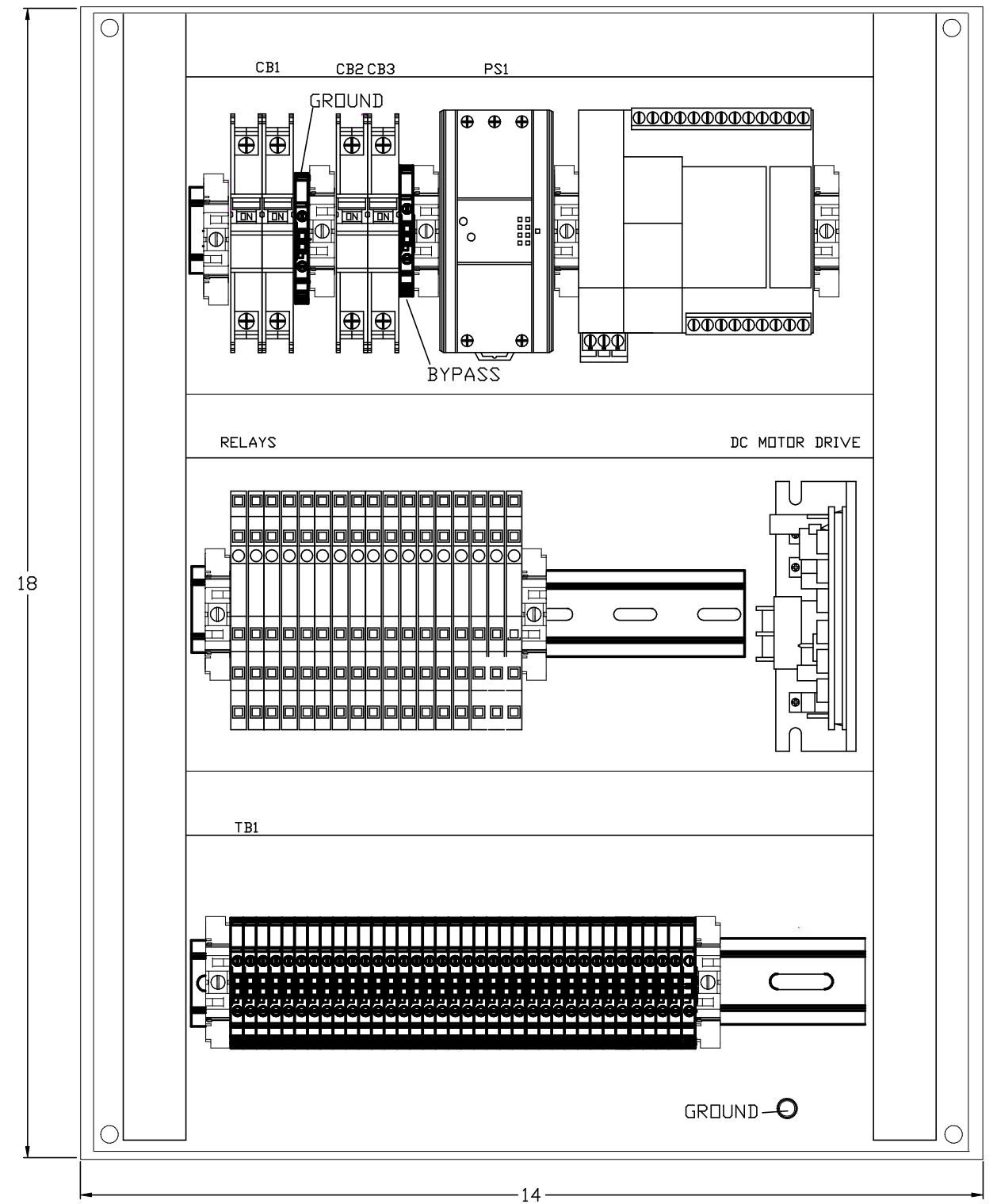
Forsta Filters Inc.
www.forstafilters.com
PO Box 341830,
Los Angeles, CA 90034
info@forstafilters.com
888.9-FORSTA
Ph: 310.837.7177
Fx: 310.837.6477



**EC-4-LP-PLC-IDEC
BACKWASH CONTROLLER
OPERATION & MAINTENANCE MANUAL**



NOTE:
CONNECTIONS TO THE PANEL MUST BE UL LISTED CONDUIT FITTING MINIMUM RATING TYPE NEMA 4x.



JCS AUTOMATION, LLC

PHONE: (661) 350-8091
PO BOX 901655; PALMDALE CA 93590-1655

NOTES:

DESCRIPTION:

MECHANICAL LAYOUT FOR 4-FILTER BACKWASH CONTROL SYSTEM WITH DC MOTOR DRIVE.

CUSTOMER: FORSTA FILTERS INC

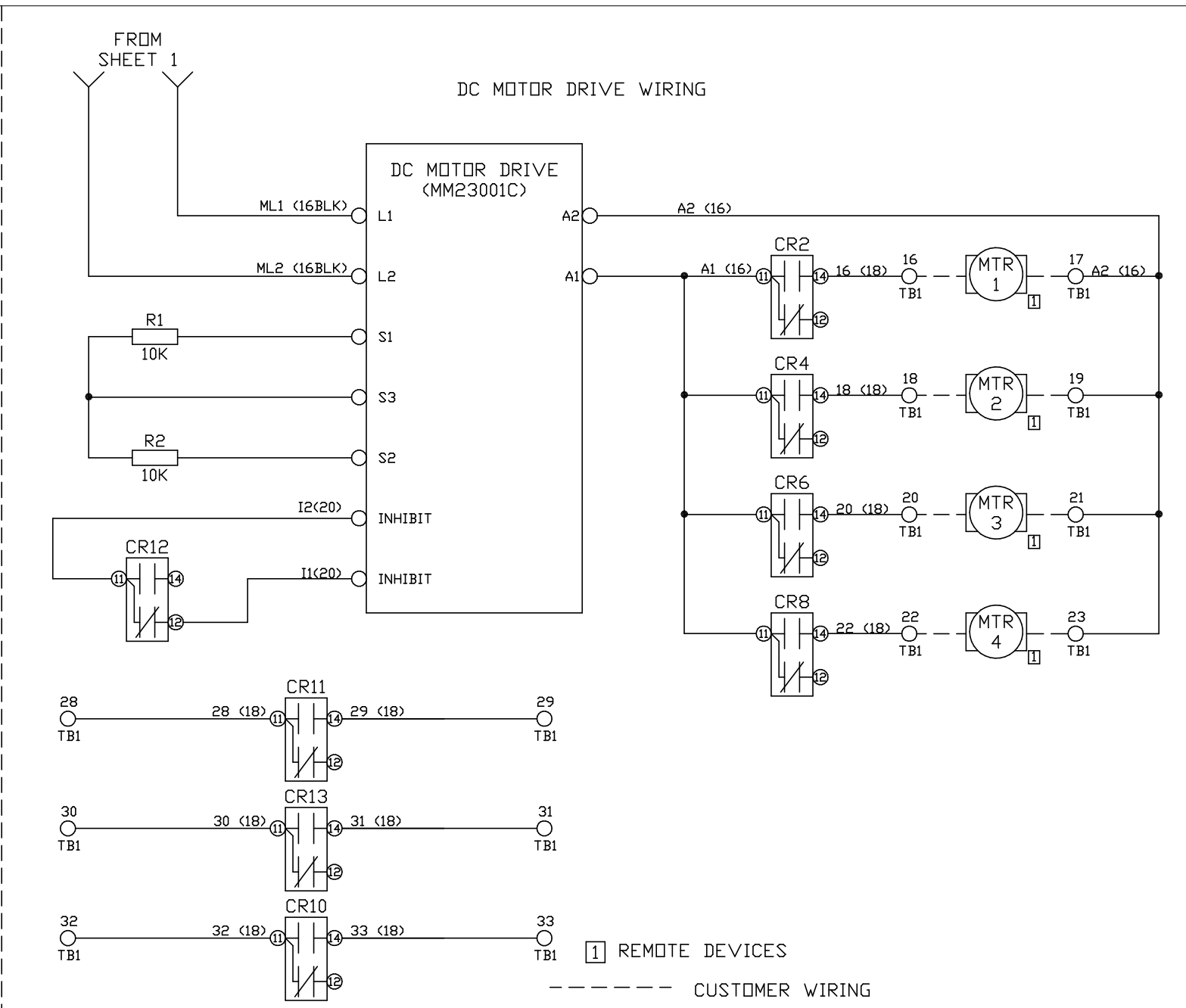
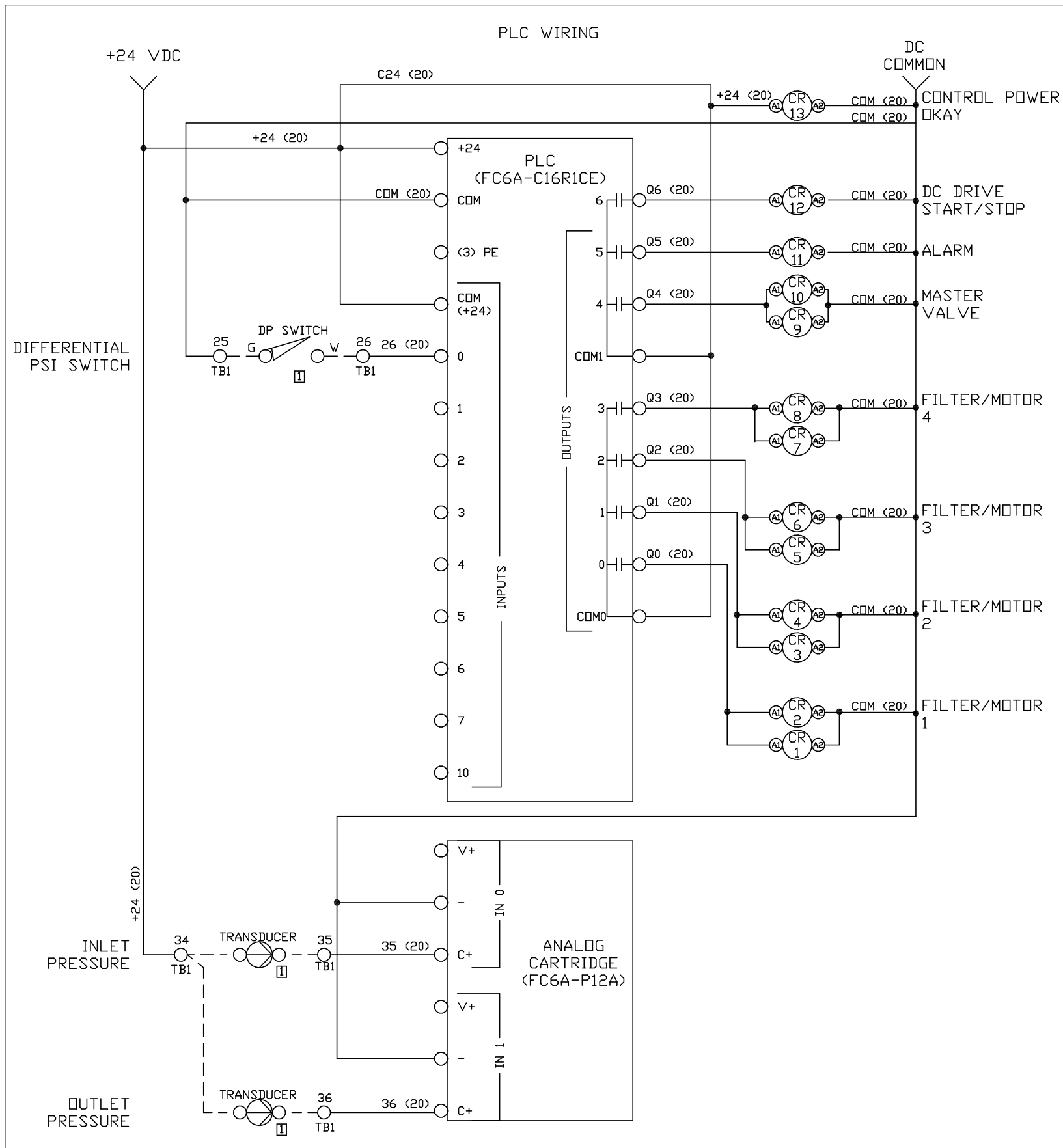
DRAWN BY:
MARK C. MAHONEY

DATE:
05/09/20

SCALE:
N/A

DWG NO.
FF050620-M REV 1.DWG

REV
B



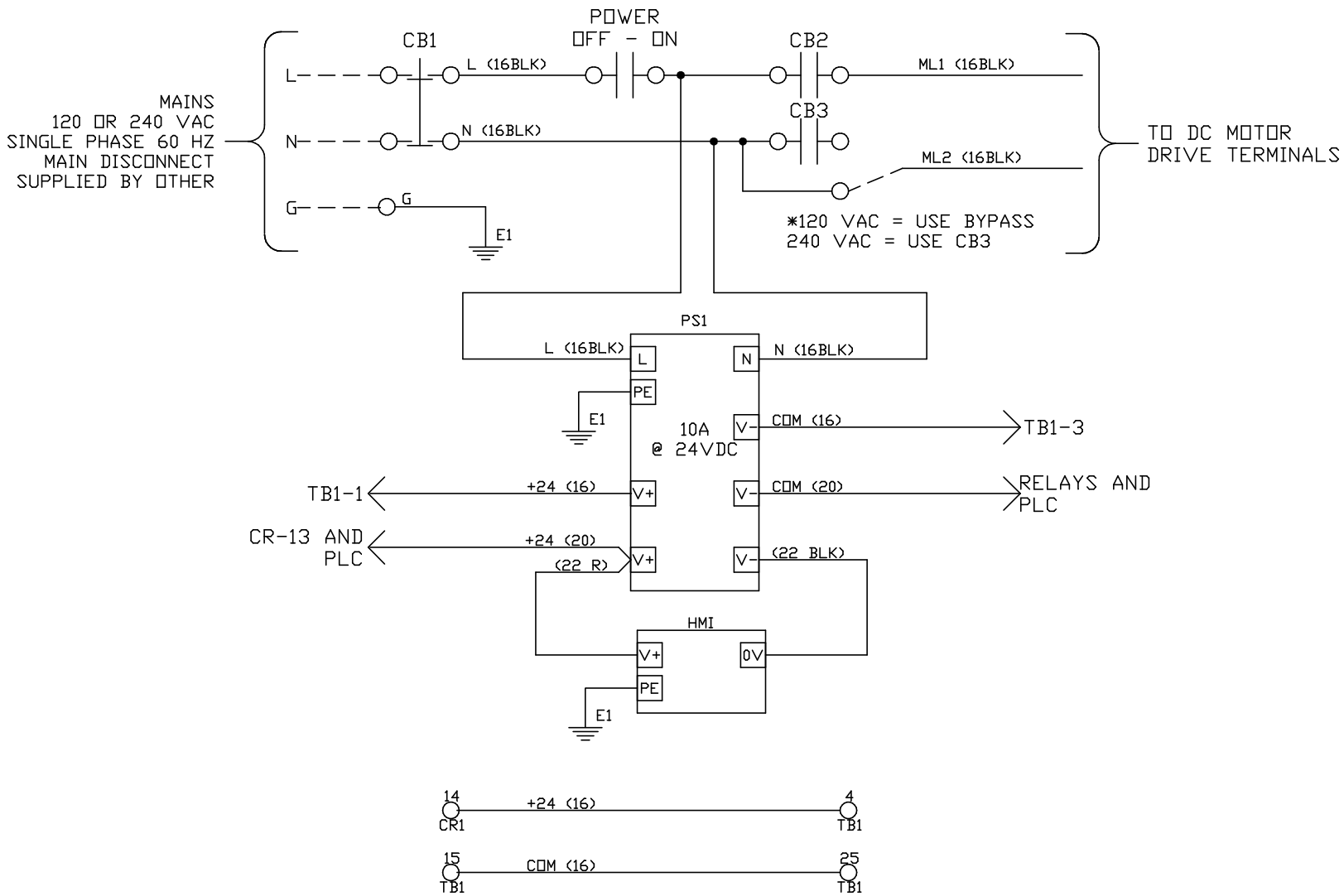
1 REMOTE DEVICES

----- CUSTOMER WIRING

NOTES:
 1. TIGHTEN TORQUE FOR TERMINALS ON TB1 IS 5.31 L.B.IN.
 2. MINIMUM WIRE SIZE FOR CONNECTIONS ON TB1 IS 18 AWG.

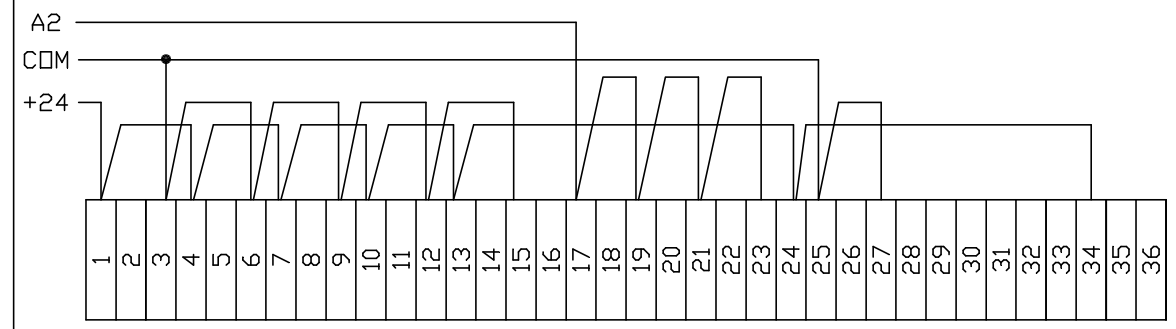
JCS AUTOMATION, LLC				
PHONE: (661) 350-8091 PO BOX 901655; PALMDALE CA 93590-1655				
NOTES:		DESCRIPTION: FACTORY WIRING - PLC AND DC MOTOR DRIVE CONTROL CUSTOMER: FORSTA FILTERS		
DRAWN BY: MARK C. MAHONEY	DATE: 05/09/19	SCALE: N/A	DWG NO. FF050620-IW2 REV 1.DWG	REV B

POWER DISTRIBUTION WIRING



* FACTORY SETTING

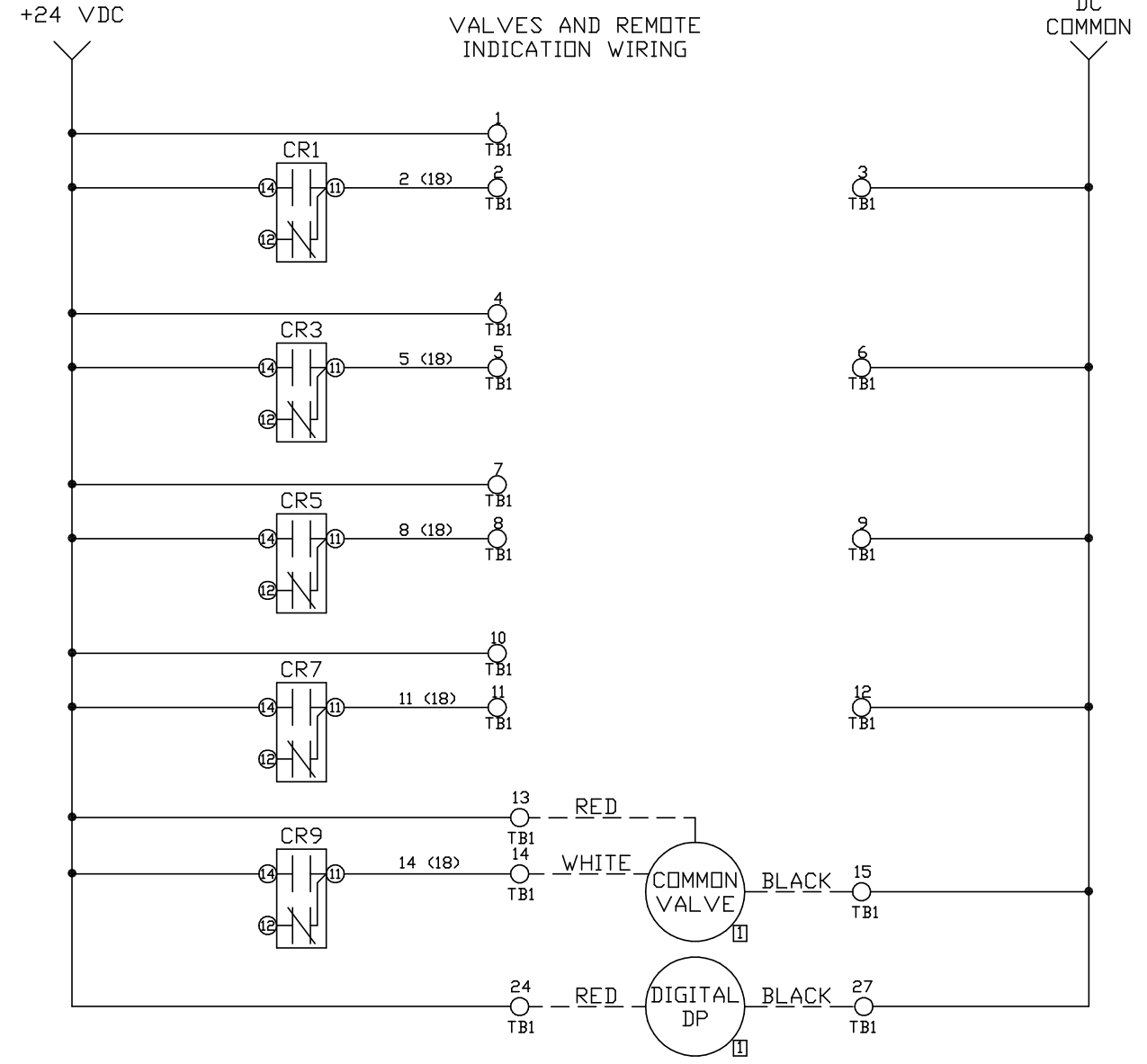
TB1 JUMPERS LAYOUT



RELAY JUMPERS

CR1-A1 TO CR2-A1
 CR3-A1 TO CR4-A1
 CR5-A1 TO CR6-A1
 CR7-A1 TO CR8-A1
 CR9-A1 TO CR10-A1
 CR1-A2 THROUGH CR13-A2
 CR1-14, CR3-14, CR5-14, CR7-14 AND CR9-14
 CR2-11, CR4-11, CR6-11 AND CR8-11

VALVES AND REMOTE INDICATION WIRING

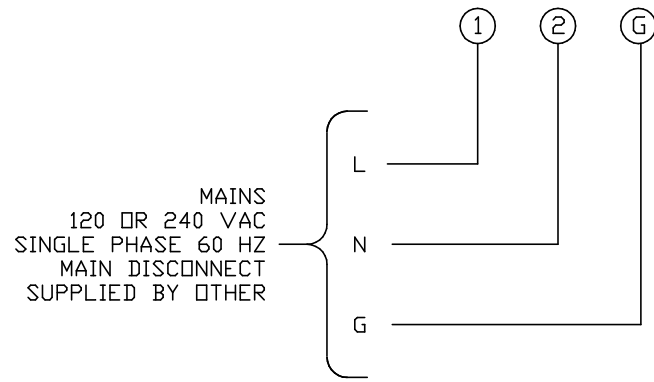


JCS AUTOMATION, LLC

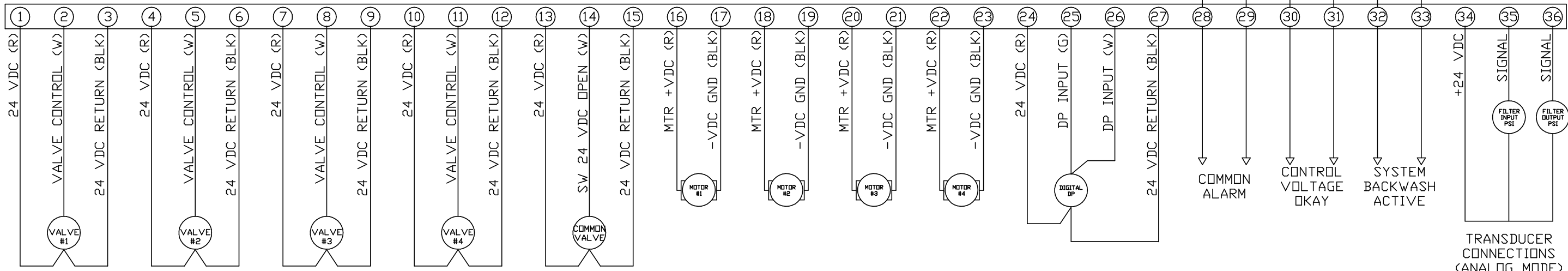
PHONE: (661) 350-8091
 PO BOX 901655; PALMDALE CA 93590-1655

NOTES:		DESCRIPTION: FACTORY WIRING - POWER AND VALVE CONTROL CUSTOMER: FORSTA FILTERS		
DRAWN BY: MARK C. MAHONEY	DATE: 05/09/19	SCALE: N/A	DWG NO. FF050620-IW1 REV 1.DWG	REV B

CB1 - MAIN POWER CONNECTION



TB1 - VALVE CONNECTIONS



ALL OUTPUTS
(3 AMPS MAX)

TRANSUCER
CONNECTIONS
(ANALOG MODE)

JCS AUTOMATION, LLC

PHONE: (661) 350-8091
PO BOX 901655; PALMDALE CA 93590-1655

NOTES:		DESCRIPTION: CUSTOMER WIRING - 4 FILTER BACKWASH CONTROL SYSTEM WITH MASTER VALVE AND DC MOTOR DRIVE.			
		CUSTOMER: FORSTA FILTERS			
DRAWN BY: MARK C. MAHONEY	DATE: 05/09/20	SCALE: N/A	DWG NO. FF050620-CW1 REV 1.DWG	REV B	

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Revision History

Revision #	Description	Date
1	Initial Draft	March 25, 2021
2	Changed the MODBUS write-up to match the program revision 1.01	March 28, 2021

1.0 System Outline

The system is designed to monitor and activate a cleaning cycle for up to four (4) filters in parallel. The controller allows the user to adjust the flush duration and the specified periodic backwash. Other features include force a backwash cycle, counter reset and alarm reset.

The system will operate in two modes. These modes will be user selected. The selections are DIGITAL or ANALOG. If digital is selected, the system will monitor the differential input from the remote mounted gage – supplied by other. If analog is selected, the system will monitor the two transducer inputs - supplied by other, for a high differential pressure set point, set by the user to initiate a backflush cycle.

1.1 Sequence of Operation:

The following section describes the sequence the controller will utilize to perform a system backwash. If the system is enabled and differential pressure monitored by the differential pressure switch, or transducer pressure in - transducer pressure out, depending on the control type selection. If the differential pressure has risen to be greater than the set point the controller will initiate a backwash cycle.

- A. The controller will start the Start delay. When this delay expires, the controller will change state from STANDBY to FLUSH VALVE 1. The following steps will occur:
 - a. The controller will signal the main valve to open and start the fixed two (2) second open delay.
 - b. When the main valve open delay expires, the controller will signal the DC motor drive to start.
 - c. The controller will then signal Valve #1 To open and switch the DC voltage to the DC Motor #1. The Backwash Delay will start timing.
 - d. When the backwash delay is complete, the controller will signal the valve for filter #1 to close, will switch the voltage off to the DC motor #1. The state will change to STANDBY and signal the main valve to close, if no other valves are utilized. If valve #2 is being utilized, then the state will change to DWELL and start the DWELL delay.
- B. When the DWELL delay is complete, the state will change to BW VALVE 2.
 - a. The controller will signal the valve for filter #2 to open and switch power to the DC motor #2. The Backwash delay will start timing.
 - b. When the backwash delay is complete, the controller will signal the valve for filter #2 to close and break power to DC motor #2. . The state will change to STANDBY and signal the main valve to close, if no other valves are utilized. If valve #3 is being utilized, then the state will change to DWELL and start the DWELL delay.
- C. When the DWELL delay is complete, the state will change to BW VALVE 3.
 - a. The controller will signal the valve for filter #3 to open and switch power to the DC motor #3. The Backwash delay will start timing.
 - b. When the backwash delay is complete, the controller will signal the valve for filter #3 to close and break power to DC motor #3. . The state will change to STANDBY and signal the main valve to close, if no other valves are utilized. If valve #4 is being utilized, then the state will change to DWELL and start the DWELL delay.
- D. When the DWELL delay is complete, the state will change to BW VALVE 4.
 - a. The controller will signal the valve for filter #4 to open and switch power to the DC motor #4. The Backwash delay will start timing.
 - b. When the backwash delay is complete, the controller will signal the valve for filter #4 to close and break power to DC motor #4. . The state will change to STANDBY and signal the main valve to close.

2.0 Special Features

2.1 Valve Selection

The system will allow for the user to select the amount of valves that the system is utilizing. The user can select up to four (4) valves to be operating.

2.2 Adjustable Delays

The controller will have field adjustable delays, using a password to gain access to the set points. There are a total of three (3) delays. These are:

1. Periodic: The delay between flush cycles. Adjustable from 0:01 to 24:00 hours.
2. Flush: The delay that the valve is signaled to be open. Adjustable from 0 to 59 seconds.
3. Dwell: The delay between valve being signaled to close and the next valve signaled to open. Adjustable from 0 to 59 seconds.
4. Start Delay: This delay will cause the system to ignore a start signal for the delay period. This delay is adjustable from 0 to 59 seconds.

2.3 Backwash Cycle Counter

The system will keep a count of all the backflush operations. There is the capability to reset this counter.

2.4 Manual Backwash Cycle Start

The controller will allow for the user to force a manual operation of the valves.

2.5 Alarm Operation and Contacts

There is a field adjustable set point for a backwash failure. If the system backwashes a total amount of the configured set point, then it will display an alarm condition on the display and turn on an output. The output is normally open and closes for indication. The contact is rated for 3 amps maximum.

2.6 Manual control of the outputs

If the system is disabled, the controller will allow for manual control of each of the outputs for diagnostic purposes.

2.7 Control Power Okay Contacts

If the system is okay, contact closes to indicate. The contact is normally open and closes for indication. The contact is rated for 3 amps maximum.

2.8 System Backwashing Contacts

If the system is backwashing, in manual or automatic, a contact will close to indicate the operation. The contact is normally open and closes for indication. The contact is rated for 3 amps maximum.

MODBUS registers for EC4-LP-PLC

The following is a list of the registers and coils that will be used in the project. A full description is supplied in the table.

For ethernet communications, the IP Address, Subnet Mask, and the Default Gateway can be configured on the communications configuration screen on the HMI.

Registers:

Registers are adjustable or varying data locations within the controller whose value is an integer value not just on or off. They can represent the system analog input for flow or pressure. The following is a list of the registers that can be accessed. The starting address of the registers is 40001.

Register	Name	Description	Register Type																										
1	Inlet Pressure	Range will be 0 to 150 PSI	Read Only																										
2	Outlet Pressure	Range will be 0 to 150 PSI	Read Only																										
3	Differential Pressure	Range will be 0 to 150 PSI.	Read Only																										
4	System Status	The following is the value for the system state. Range is 0 to 32,767. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Value</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>System in Standby</td></tr> <tr><td>1</td><td>Main Valve Active</td></tr> <tr><td>2</td><td>Backwash #1</td></tr> <tr><td>3</td><td>Dwell</td></tr> <tr><td>4</td><td>Backwash #2</td></tr> <tr><td>5</td><td>Dwell</td></tr> <tr><td>6</td><td>Backwash #3</td></tr> <tr><td>7</td><td>Dwell</td></tr> <tr><td>8</td><td>Backwash #4</td></tr> <tr><td>9</td><td>Settling</td></tr> <tr><td>10</td><td>In Test Mode</td></tr> <tr><td>11</td><td>Comm Lockout</td></tr> </tbody> </table>	Value	Description	0	System in Standby	1	Main Valve Active	2	Backwash #1	3	Dwell	4	Backwash #2	5	Dwell	6	Backwash #3	7	Dwell	8	Backwash #4	9	Settling	10	In Test Mode	11	Comm Lockout	Read Only
Value	Description																												
0	System in Standby																												
1	Main Valve Active																												
2	Backwash #1																												
3	Dwell																												
4	Backwash #2																												
5	Dwell																												
6	Backwash #3																												
7	Dwell																												
8	Backwash #4																												
9	Settling																												
10	In Test Mode																												
11	Comm Lockout																												
5	1000's Cycles	Range 0 to 32,767.	Read Only																										
6	100's Cycles	Range 0 to 999	Read Only																										
7	Periodic Time Remaining (hours)	Time remaining to the next periodic backwash cycle.	Read Only																										
8	Periodic Time Remaining (minutes)	Time remaining to the next periodic backwash cycle.	Read Only																										
9	Periodic Time Remaining (seconds)	Time remaining to the next periodic backwash cycle.	Read Only																										
10	System Lockout	A value greater than 0 is equal to system communications lockout, if the value is equal to 0, then the system is not locked out.	Read/Write																										
11	Remote Start	A value greater than 0 is equal to a remote start. When the sequence is complete, the controller will set the value back to 0.	Read/Write																										

4.0 Main HMI Screen

The following section describes the screens of the controller. The following screens are the main screens. Depending on the configuration of the system, all the options may not be displayed as shown below.

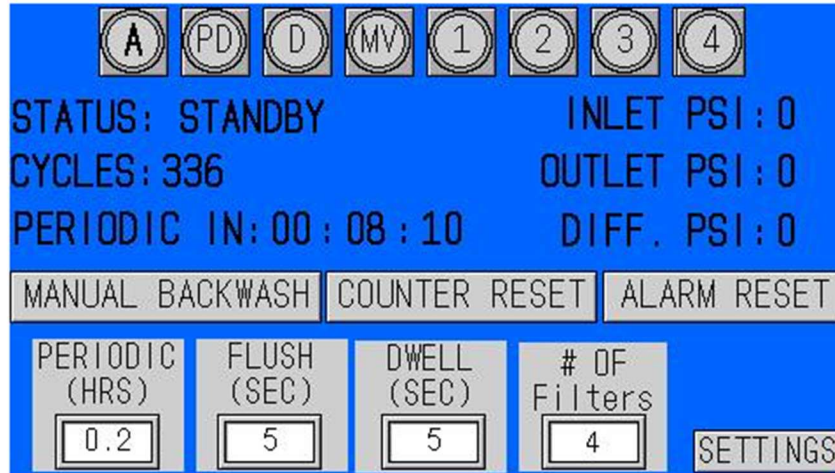


Figure 1: Main Screen, Analog

Notes:

1. A-LED indicates if there is an active alarm.
2. PD-LED indicate when there is a start from the digital pressure input.
3. D-LED indicates when the dwell is timing.
4. MV-LED indicates when the main valve is active.
5. 1-LED through 4-LED indicates the status of each valve. LEDs 2 through 4 are present when the selected number of filters are greater than 1. The following describes the color of the LEDs:
 - a. Grey – Not active but enabled.
 - b. Green – In operation.
 - c. Red – Disabled. This is achieved by touching the LED.
6. Status display shows the present of the system. The indications are:
 - a. Standby – System waiting for next sequence start.
 - b. Main Valve On – Indicates the main valve is on and the sequence has started.
 - c. Backwash #1 through #4 – Indicates that valve is in operation.
 - d. Dwell – Dwell is timing between valve operations.
 - e. Settling – Indicates the settling delay between cycles is active.
7. Manual Override Button will force a complete flush cycle.
8. Reset Alarm Button if pressed will reset an active alarm.
9. Set the periodic delay as desired for the system. This delay sets a timed flush cycle. This delay is adjustable from 0:0 to 24.0 hours. Set this value to zero (0) if this function is not to be utilized.
10. The Flush delay. This is how long the controller will hold the valve open for the flush cycle.
11. The Dwell delay. This is how long the controller will wait between the valve flush operations during the flush cycle.
12. # Of Valves button will allow for the selection of the total number of valves the system will control. Repeat touching to scroll between 1 and 4 valves.
13. Settings button will allow access to the set points.

5.0 Set Points Access

To access the set points, on the main display, depress the Settings button.

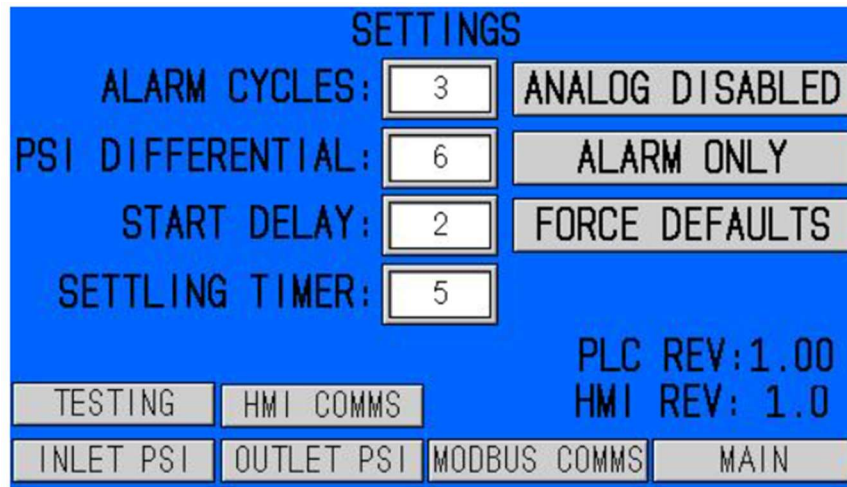


Figure 2: Settings Screen with analog

Notes:

1. ALARM CYCLES: Set Point allows for the selection of how many cycles the controller will perform without the digital or analog differential pressure being cleared before an alarm will occur. The value is adjustable from 1 to 20 cycles.
2. PSI DIFFERENTIAL: set point is for if the analog mode of operation. The value is adjustable from 1 to 20 PSI.
3. START DELAY: The value is adjustable from 1 to 300 seconds.
4. SETTling TIMER: The value is adjustable from 1 to 300 seconds.
5. Digital / Analog Control button will select the control type of the system. Selections include ANALOG DISABLED and ANALOG ENABLED. When enabled then the analog functions are enabled.
6. Alarm Selection button. The selections are:
 - a. ALARM ONLY – When the alarm is active, the system will indicate the alarm on the HMI and the contact closure but will continue to backwash. The alarm will stay active until the alarm is reset.
 - b. ALARM LOCKOUT – When the alarm is active, the system will indicate the alarm on the HMI and the contact closure but will be locked out until the alarm is reset.
7. FORCE DEFAULTS - will force the controller to put the factory default values into the set points.
8. TESTING button will allow access to the testingscreen. This will allow the user to control individual outputs.
9. HMI COMMS button will select the HMI ethernet communications screen. This selects the IP addressing of the HMI web page.
10. INLET PSI button will select the inlet PSI transducer calibration screen.
11. OUTLET PSI button will select the outlet PSI transducer calibration screen.
12. MODBUS COMMS button will select the MODBUS ethernet communications screen.
13. MAIN button will display the main screen.
14. PLC REV shows the revision number of the PLC software.
15. HMI REV shows the present revision of the HMI software.

5.1 Analog Settings Screen

To access the analog set points, press the Analog Settings button on the Settings screen. Shown is the inlet PSI screen. The outlet PSI screen has the same settings.

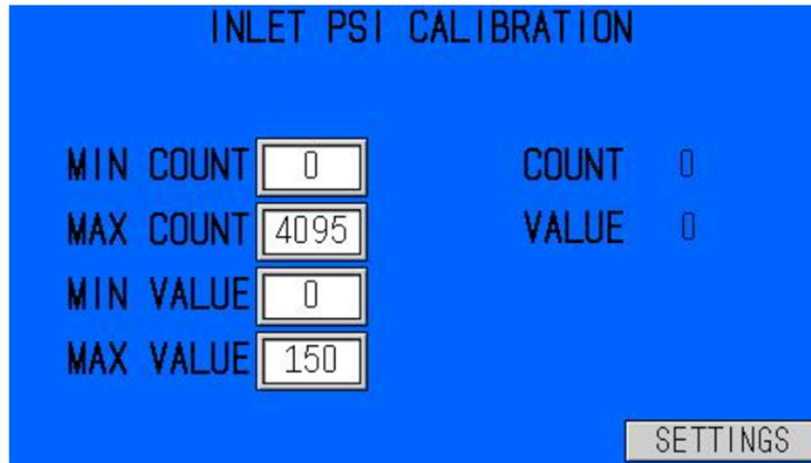


Figure 3: Analog Configuration screen.

Notes:

1. COUNT is the actual signal from the transducer. The value will vary between 0 and 4095.
2. VALUE shows the configured engineered value.
3. MIN COUNT: With the transducer input at 4 ma, set the value to the count value.
4. MAX COUNT: With the transducer input at 20 ma, set this value to the count value.
5. MIN VALUE: is set to the minimum value of the transducer. If it is rated for 0 to 150, then a 0 is entered here.
6. MAX VALUE: is set to the maximum value of the transducer. If it is rated for 0 to 150, then a 150 is entered here.
7. SETTINGS button returns to the Settings screen.

5.2 System Test Screen

To access the manual control of the outputs depress the System Test button on the Settings screen.

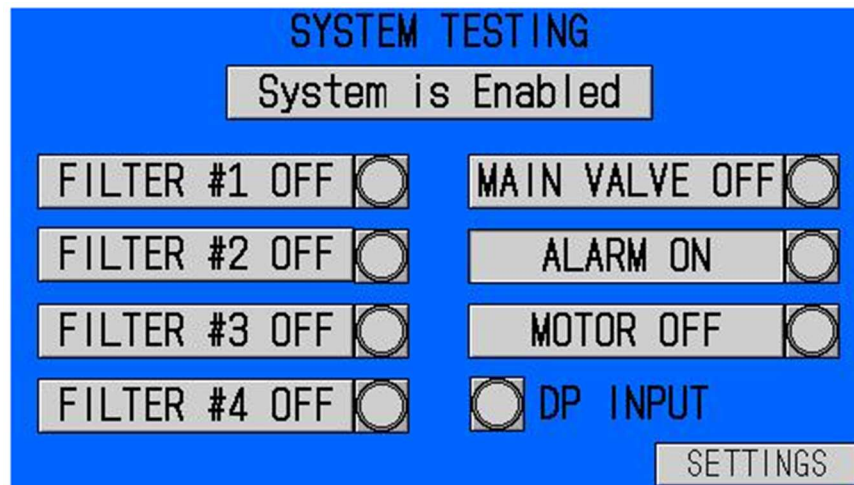


Figure 4: Manual control of outputs.

Notes:

1. TEST MODE button is used to enable the test mode operation. When enabled, the system is locked out to allow for forcing the outputs on and off.
2. Press the button for the desired output that needs to be forced on. These buttons only work when the system is disabled. Note that only one filter valve can be on at a time.
3. SETTINGS button returns to the Settings screen.

5.3 HMI COMMS Screen

To access the HMI comms page select the HMI COMMS button on the settings screen.

HMI COMMUNICATIONS SETTINGS				
IP	192	168	1	6
SUBNET	255	255	255	0
GATEWAY	192	168	1	0
SET CHANGES				
SETTINGS				

Figure 4: HMI Communication Settings screen.

Notes:

1. Enter the IP address for access to the HMI web page.
2. Depress the SET CHANGES button to confirm the changes. The HMI will reset and the new values will be active.
3. SETTINGS button returns to the Settings screen.

5.4 MODBUS COMMS Screen

To access the MODBUS COMMS screen, select the MODBUS COMMS button on the settings screen.

MODBUS COMMUNICATIONS SETTINGS

IP	192	168	1	50
SUBNET	255	255	255	0
GATEWAY	192	168	1	100

SET CHANGES

ACTUAL IP 192. 168. 1. 50

ACTUAL SUBNET 255. 255. 255. 0

ACTUAL GATEWAY 192. 168. 1. 100

SETTINGS

Figure 4: HMI Communication Settings screen.

Notes:

1. Enter the IP address for access to the HMI web page.
2. Depress the SET CHANGES button to confirm the changes. The actual values will change to confirm the new addresses.
3. SETTINGS button returns to the Settings screen.

6.0 Controller Set Points

The following section has the set point listing and the factory set point values.

6.1 Time delay Set Points

Delay	Adjustment	Factory Set Value	User Value
Periodic	Adjustable from 0.0 to 59:59 hrs.	05:00	
Backwash Delay	Adjustable from 0 to 59 seconds.	5	
Dwell Delay	Adjustable from 0 to 59 seconds.	1	
Start Delay	Adjustable from 0 to 59 seconds.	2	

6.2 Alarm Set Point

Set Point	Adjustment	Factory Setting	User Settings
Backwash Alarm	Adjustable from 1 to 20.	3	

6.3 Number of Valves

Set Point	Description	Factory Setting	User Settings
Amount of Valves	Adjustable 1 to 4	1	

6.4 Mode Select Set Points

Set Point	Adjustment	Factory Setting	User Settings
Mode Analog or Digital	Selections are ANALOG or DIGITAL	DIGITAL	

6.5 Analog Configuration Set Points

Set Point	Adjustment	Factory Setting	User Settings
Filter in PSI MAX Value	Adjustable from 0 to 500.0 PSI	150.0	
Filter in Minimum Value	Adjustable from 0 to 500.0 PSI	0.0	
Filter in Minimum Count	Adjustable from 0 to 32767	249	
Filter in Maximum Count	Adjustable from 0 to 32767	1023	
Filter out PSI Max Value	Adjustable from 0 to 500.0 PSI	150.0	
Filter out Minimum Value	Adjustable from 0 to 500 PSI	0.0	
Filter out Minimum Count	Adjustable from 0 to 32767	249	
Filter out Maximum Count	Adjustable from 0 to 32767	1023	

6.0 Controller Connections

The following section describes the connections to the controller in the system. The controller has a total of 8 digital inputs, 2 analog outputs for 4-20 ma analog inputs and 8 relay outputs.

6.1 Digital Inputs

Input	Nomenclature	Description
In_00	Differential input	Differential pressure input from differential pressure gauge.
In_01	Spare	Not used in this application
In_02	Spare	Not used in this application
In_03	Spare	Not used in this application
In_04	Spare	Not used in this application
In_05	Spare	Not used in this application
In_06	Spare	Not used in this application
In_07	Spare	Not used in this application

6.2 Digital Outputs

Output	Nomenclature	Description
Out_00	Valve #1	Controls Valve #1 operation
Out_01	Valve #2	Controls Valve #2 operation
Out_02	Valve #3	Controls Valve #3 operation
Out_03	Valve #4	Controls Valve #4 operation
Out_04	Master Valve	Controls Master Valve operation
Out_05	Alarm	Controls the alarm contacts.
Out_06	Motor Start	Controls the Inhibit input to the DC Motor Drive.
Out_07	Spare	Spare output

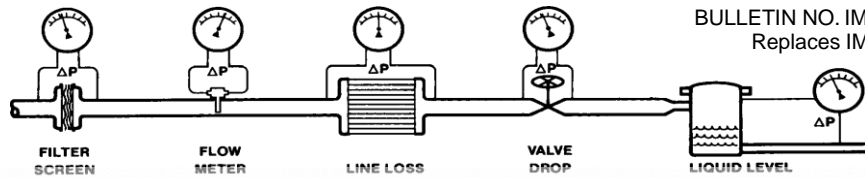
6.3 Analog Inputs

Output	Nomenclature	Description
An_In_00	Filter Inlet PSI	Transducer input for the filter input pressure
An_In_01	Filter Outlet PSI	Transducer input for the filter outlet pressure

Mid-West®

Instrument

MODEL 522 Installation and Operating Instructions



BULLETIN NO. IM522/14A
Replaces IM522/13A

SYMBOLS USED ON PRODUCT



Caution Risk of Dangerous. Please refer to this documentation when seen marked on the product.



Equipment protected throughout by double insulation.



This product is CE marked for conformance with the Low Voltage Directive (73/23/EEC)

INSPECTION

Before installation check the receiving paperwork and the intended application for correct part number, materials of construction, working pressure, dial range, etc. If equipped with switches, check electrical rating. Inspect for shipping damage and, if damaged, report it immediately.

NOTE - Before attempting repairs contact your local Mid-West Representative or our factory. Failure to do so will void any warranty.

INSTALLATION

The model 522 Indicating Differential Pressure Gauge / Switch is calibrated and tested prior to shipment and is ready for immediate installation. Use of the following installation procedures should eliminate potential damage and provide optimum trouble-free operation.

1. PROCESS CONNECTIONS

1/4" FNPT are provided as standard but check paperwork for connections or dered. There are two connections on the body identified as "hi" and "lo" for high pressure and low pressure. Be sure these get plumbed to the proper connections on your system. Improper connection will not damage the instrument, but it will not function properly.

2. INSTRUMENT LOCATION

On liquid service the instrument should be mounted **below** the process connections to facilitate self-bleeding. On gas service it should be located **above** the process connections to promote self-draining. If the process contains particulates, a "pigtail" loop or drop leg (manometer "U-tube" configuration) in the tubing will minimize the possibility of it migrating into the instrument.

MATERIALS:

Elastomers: As specified on the order

Body: As specified on the order

Internals: Acetal, Ceramic, & SS

Switch: Flame Retardant VALOX & Flame Retardant Epoxy

Connector: Polyamide 6, 30% Glass Fill, Flame Retardant

ELECTRICAL (LE OPTION- STANDARD) (SW OPTION - 3COLOR DIAL)



WARNING: ELECTRICAL CONNECTIONS SHOULD BE PERFORMED BY QUALIFIED PERSONNEL AND MEET REPRESENTATIVE NATIONAL ELECTRICAL CODE.

IT IS RECOMMENDED TO REMOVE POWER TO THE SWITCH PRIOR TO MAKING SET POINT ADJUSTMENTS.

CAUTION: THIS DEVICE DOES NOT REQUIRE POWER TO OPERATE. CONNECTION DIRECTLY ACROSS A MAINS POWER SOURCE MAY DAMAGE THE SWITCH.

The SPST (Single Pole Single Throw) switch is intended for on / off control or status input to devices that have load characteristics within the ratings of 60 Watts max, 3 A max., 240 VAC / VDC maximum. **The product of the switching voltage and current shall not exceed 60 W.**

The adjustable switch supplied with your order can be re-adjusted between 40% and 95% of the full scale range of the gauge by loosening the two adjustment screws and sliding the switch assembly. Sliding the switch to the left (facing the dial front) decreases the switch set point. Re-tighten the switch adjusting screws while applying light pressure to assembly to keep it from rotating or shifting.

Interface:

The DIN interface conforms to DIN 43 650A / ISO 4400 and **when mated** provides an IP65 rated protection class. The cable gland seal will accommodate an outer diameter of 4.5mm (.18") to 7mm (.28"). The right angle mating connector is supplied with the gauge upon order. Clocking (orientation) can be changed by prying out the insert and rotating the insert to the desired clocking (90° increments).

Wiring to the SPST switch is between terminals 1 & 2.

CE Marking Statements:

This product is CE marked in compliance with the Low Voltage Directive to EN-61010-1.

This product shall not be placed in an Explosive atmosphere as defined by the ATEX Directive 94/9/EC except if evaluated to be "Simple Apparatus" and it is installed in an intrinsically safe system.

This product may be classified as simple apparatus. However, the evaluation to the relevant portions of the applicable standards and clearly identifying the product as simple apparatus shall be the responsibility of the end user.

Pressure Equipment Directive:

The Pressure Equipment Directive has been determined to be **non applicable for CE marking**. These products are manufactured in accordance with article 3, paragraph 3 of the directive, "sound engineering practice". They fall below category I for non-hazardous gases, hazardous liquids, & non-hazardous liquids. This product also falls below category I for hazardous gases at or below 200 bar.

Simple Apparatus NEC 504.2

This product meets the simple apparatus definition as defined in NEC 504.2 of Article 504 (Intrinsically Safe Systems). Because of this classification, equipment listing is not required (504.4) and ordinary wiring methods shall be permitted (504.20) provided it is installed in an Intrinsically Safe System. Proper installation of this product in a hazardous location to the applicable requirements is the responsibility of the end user / equipment installer.

SPECIFICATIONS

WORKING PRESSURE: 1000 PSI (69 bar) for Aluminum and Stainless Steel
1000 PSI (69 bar) for Acetal

PROOF PRESSURE: 2000 PSI (139 bar) for Aluminum and Stainless Steel
2000 PSI (139 bar) for Acetal

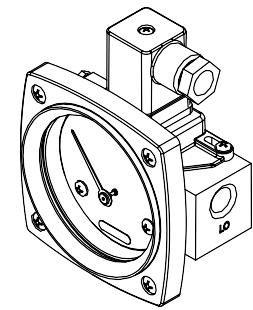
MAX. DIFFERENTIAL PRESSURE (HI TO LOW): 200 PSID (13.8 bar)

ACCURACY: ±5 % of Full Scale

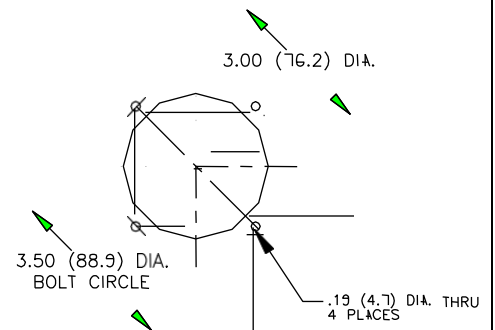
TEMPERATURE LIMITS: -40 °F (-40° C) to 200°F (93°C). These limits are based on the entire instrument being saturated to these temperatures. System (process) temperatures may exceed these limitations with proper installation. Contact our customer service representative for details.

STANDARDS: All Model 522 Series differential pressure gauges either conform to and/or are designed to the requirements of the following standards:

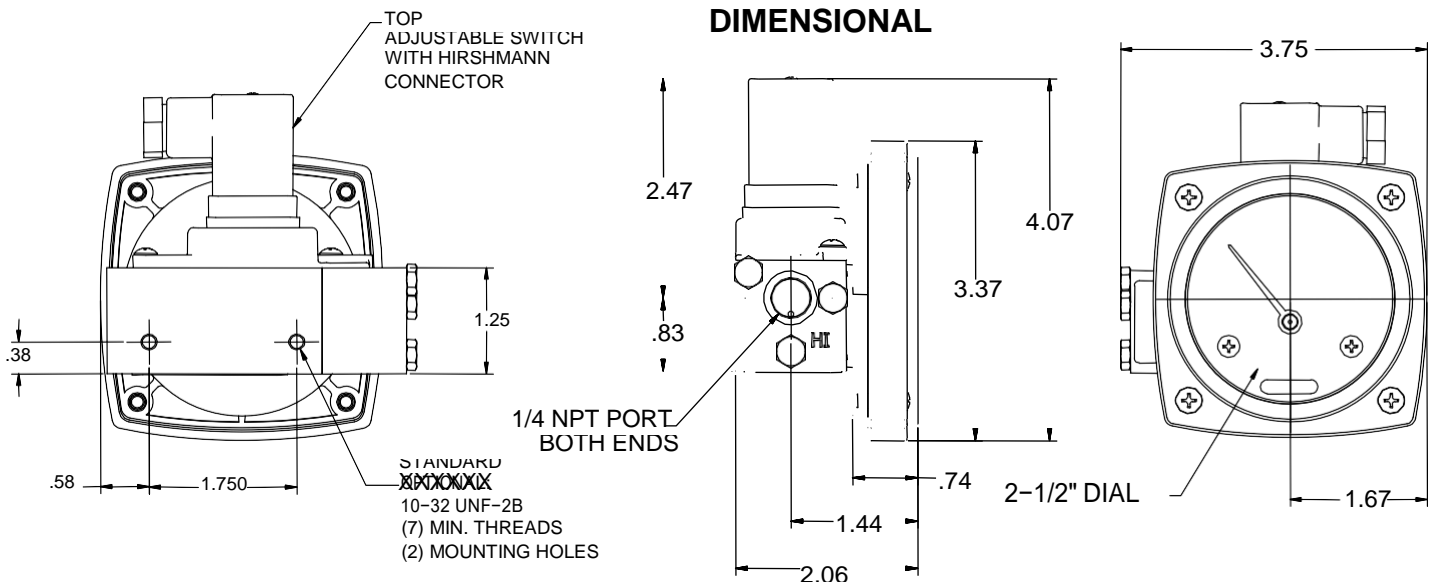
- | | |
|--------------|----------------------|
| ASME B1.20.1 | CSA-C22.2 No. 14 |
| ASME B40.1 | NEMA Std. 250 |
| EN-61010-1 | UL Std. No. 50 & 508 |



PANEL CUT-OUT

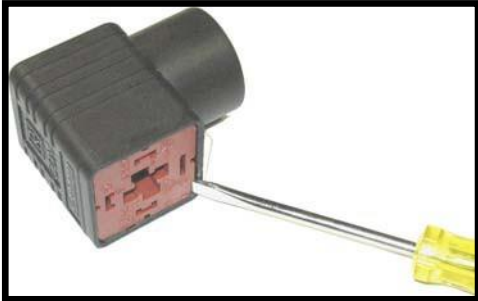


DIMENSIONAL



Mating Connector: Connection Instructions

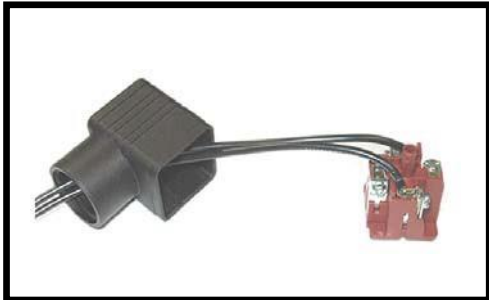
(Note: Delivered connector may appear different from item pictured)



Remove the plug-in connector from the gauge assembly and using a screwdriver pry out the insert from the connector shell.



Insert connection wires through the connector shell as shown.



Strip wire lead ends and connect to terminal locations 1 & 2 as shown. Terminals are marked.



Insert terminal connection insert into connector shell. Rotate if necessary to the desired clocking.

Mid-West[®]

Instrument

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