CITY OF Grand Junction COLORADO

Purchasing Division

ADDENDUM NO. 1

DATE: June 22, 2018
FROM: City of Grand Junction Purchasing Division
TO: All Offerors
RE: Water Treatment Plant, Collection and Distribution Supervisory Control and Data Acquisition Automation System (SCADA) RFP-4525-18-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. Is there already a pre-approved system integrator list?

   A. No

2. Q. Has the SCADA software been pre-selected?

   A. No

3. Q. Page 20 – 4.2.9 Pricing – It looks like the City wants a base (lump sum) price for:
   a. Hardware (PLCs, I/O, computer(s), network equipment
   b. Software (OS, Application Software, backup SW, etc.)
   c. License (& software support agreement)
   d. Labor for config of proposed system, startup, training, travel
   e. Travel costs for system install and start-up

   Is this also how the city wants the "complete breakdown list of pricing" as described In Section 5.0 Section E? Or does the pricing need to breakdown further into individual parts?

   A. These 5 categories for breakdown is sufficient.

4. Q. What quality of network connectivity exists between City Hall and the WTP?

   A. The current connection is a 200Mbps Microwave Link.

5. Q. Will the city provide required network equipment (i.e. Routers, switches) or are those contractor-supplied? It was suggested at the walkthrough that the city would provide those in order to keep hardware the same as currently used.

A. The city will provide the required networking equipment.

6. Q. Password management system? Sounds like this applies at the Operating System level. Or does it apply also at the application layer?

   A. The city already has an Operating System Password policy that enforces passwords at the application level. The application must also enforce the same password policies

7. Q. Attachment A lists both WTP process equipment and remote equipment – Does the Phase I scope of work include all items in the Attachment or only those that are required for “in-plant” process control?

   A. Phase 1 involves all items listed in Attachment A except those under the heading of "Include for Future Addition of". There are two new projects planned for late 2018-early 2019 that will require 1. Intake Structure Telemetry & 2. PRV Station Monitoring on Flowline to also be integrated into Phase 1 even though they do not exist at the present time. These two items are the only remote telemetry items to add for Phase 1 as the Purdy Mesa Remote Valve and the Kannah Creek Remote Control Valve are already functioning as part of the Kannah Creek WTP's SCADA system.

8. Q. On page 28 of the RFP (Include for Future Addition of), is the city wanting the contractor to include in this proposal all costs for implementing the data points described including hardware / software / installation, etc. or is the city’s intent to ensure that any provided SCADA equipment has the ability to expand in the future to be able to handle this equipment?

   A. The intent is to ensure that any provided SCADA equipment has the ability to expand to be able to handle this equipment. Other items to add to the “Future Additions List” include 1. Control and Monitoring of the Gunnison River Pump Station (2 pumps, 2 VFDs, flowmeter, pressure) 2. Reservoir #4 Level Sensor.

9. Q. For maintenance and support can we provide daily or hourly support costs for on-site and remote site support, since we cannot estimate total support needs?

   A. Yes, please provide daily/hourly support costs and/or proposed Maintenance Contract costs.

10. Q. Is upgrade of the Motor Control Center part of this project?

    A. It is not a part of Phase 1, but proposed cost of upgrading for budgetary purposes would be appreciated

11. Q. Will the City provide copies of the Input/Output database for all existing plant PLC’s and the Red Lion OIT prior to the bid as they are necessary to provide an accurate estimate of Phase I work?

    A. Yes

12. Q. Will the City make accessible or provide copies of all WTP control wiring drawings prior to the bid?

A. Yes

13. Q. What data points are currently recorded by the electronic chart recorders?

    A. 4 individual filters for flow, turbidity, and particle counts. Effluent flow, turbidity, chlorine, pH, Fluoride. Water tank level, free chlorine, city water main flows (x 2). Influent flow, turbidity, pH, chlorine, flowline pressure. Raw water flowlines flow, turbidity, pH (two of them all). Raw water pump flow. Clearwell level.

14. Q. Is the City looking for SCADA communications to remote sites to be on an ethernet / internet platform or is fixed band radio acceptable? Or a combination of technologies as required to make the system work as desired?

    A. This can be a combination of communications technologies if it is secured with the appropriate security controls.

15. Q. What are the new and total Input/Output counts for the budgeted Phase I portion of the project?

    A. Total I/O counts for Phase 1 will be determined through the design process with the selected integrator.

16. Q. Will the City provide a list of all remote sites to be included in Phase I?

    A. PRV Stations on Purdy Mesa Flowline 38.962 / -108.362
    B. Intake Structure Telemetry (phone/wifi-umbrella nearly) 38.963 / -108.227
    C. Purdy Mesa Control Valve & flowmeter (already wired to Kannah Creek SCADA system) 38.9688 / -108.2944
    D. Kannah Creek Control Valve & flowmeter (has radio system to Kannah Creek SCADA) 38.9616 / -108.2723

17. Q. Are there existing communications between the WTP and any Phase I remote sites? If so, what form of communication is being used and to which sites (i.e Hardwire, radio, Fiber, ethernet)?

    A. Purdy Mesa Control Valve and flowmeter are hard-wired to the Kannah Creek SCADA system
    B. Kannah Creek Control Valve and flowmeter signals are transmitted to the Kannah Creek SCADA system via a repeater and Phoenix Radio (900 MHz) located at the Kannah Creek Water Tanks on a highpoint above an to the southwest of Juniata Reservoir.

       The Kannah Creek SCADA system can currently be accessed by WTP staff via LogMeIn, where monitoring and control of the valves can be done.

18. Q. What if any PLC & operator interface equipment is being utilized at any Phase I remote sites?

    A See # 17

19. Q. I'd like information about the number and types of PLCs the SCADA is to connect to in phase 1. There are two ways to do this.

1. Send copies of the PLC files, this will contain the most information for me.
2. Send a list of the PLCs make and model, this will contain less information but is an option if it is not possible to give out the PLC code.

A. Some PLC files are attached to this Addendum. Due to software access issues, the attached does not represent the total PLCs in its entirety. The selected firm will be given access to the PLCs at the Water Plant after contract award.

20. Q. Can you send me IO lists per PLC if they are available? If they are not available this information can be found in the PLC files if they are sent as option 1a above.

A. Some PLC files are attached to this Addendum. Due to software access issues, the attached does not represent the total PLCs in its entirety. The selected firm will be given access to the PLCs at the Water Plant after contract award.

21. Q. There are different ways to handle remote access to the servers. Which method would be preferred?

1. VPN access to the control network, this will allow remote computers to connect into the network. This gives good freedom to work because people can use their own computers with their own programs to work on and monitor the system. However, this is less secure because it is more difficult for the City of Grand Junction to monitor 3rd party computers for malicious software intentional or not.
2. Dedicated engineering computer on the control network with Remote Desktop access, so users can login remotely and use the programs installed on that computer to work on the system. More secure because the engineering machine can be administered by the City of Grand Junction and users can only use the programs installed on it, hence reducing the risk of malicious software entering the system.
3. No remote access, all work and monitoring must be done from site. Most secure, least flexible.

A. All remote access to the City's internal resources must be done via a VPN connection requiring multi-factor authentication using the city's existing RSA SecurID services. The actual access level will stop at a dedicated computer and not access the secure controls network.

22. Q. If option 3.b is chosen would you like Rockwell Logix500 and Logix5000 software included in the bid? This will be used to view and edit PLCs, not a requirement for this SCADA job but would be useful in the future to help with remote troubleshooting. So it could be setup from the start if you like.

A. Remote troubleshooting is desirable, please include

23. Q. No contact information is provided in section 1.1 of the RFP, please provide information.

A. The contact for this RFP is the City Purchasing Representative Duane Hoff.
Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org
(970) 244-1545

24. Q. Provide a complete I/O list as mentioned in the pre-bid meeting.

A. Please refer to Attachment A & the PLC files provided

25. Q. What SCADA software is used at the KCWTP currently?

    A. Opto 22

26. Q. In the RFP it mentions budget cycles and 2018 plant improvement budget. Are these budgets provided or will they be discussed with the selected integrator to build the phases as discussed in the RFP?

    A. Budget will be discussed with the selected integrator.

27. Q. The RFP requires a long list of security features of the software provided (items in 4.2.7), yet requires a "Packaged software product" (4.2.4). We will be constrained by the selected "packaged software product" and the offerings as part of the vendor supplied package. Most current SCADA software packages offer most but not all of the required features. Is this a point of discussion during the design of the system with the city?

    A. List any exceptions to the security functions requirements in the RFP. The security features will be scrutinized by the City's IT Department for acceptability their its entirety.

28. Q. Often times we go thru a software and hardware selection process prior to costing out the hardware and software with the owner. Is this a desired step in the design process as it is currently not indicated in the RFP documents.

    A. Yes. Selection of desired hardware and software will be a step in the design process with the selected integrator. The cost of these components will be considered during their selection.

29. Q. Does the owner have a software preference for the SCADA software?

    A. No

30. Q. Does the owner have a PLC hardware preference for the SCADA Hardware?

    A. Different PLC brands exist throughout the water system. The City desires to make our infrastructure more consistent if possible. The PLC installed as part of the filter upgrade in 2016 was Allens/Bradley.

31. Q. A question was raised during the walk through regarding the programs for the current PLCs. Has that been verified that the programs with tag/register information would be available?

    A. Yes. Some PLC files are attached to this Addendum. Due to software access issues, the attached does not represent the total PLCs in its entirety. The selected firm will be given access to the PLCs at the Water Plant after contract award.

32. Q. I was wondering if I could arrange a site visit either next Monday or Tuesday to the remote locations that are called out in the SCADA system RFP.
    Those sites are critical to the bid process and very limited or no information was given in the RFP or the walkthrough about them.
    If a site visit cannot be arranged, are there pictures, hardware listing and GPS coordinates available for these locations?
    Sites of particular interest:

Gunnison River Pump Station
*Purdy Mesa Influent Control Valve
Purdy Mesa Remote Valve
*Kannah Creek Influent Control Valve
*Kannah Creek Bypass Valve
Kannah Creek Remote Control Valve
*Reservoir Pump 40 hp On/Off
*Reservoir Pump Valve%
*Reservoir 75 hp Pump On/Off
*Reservoir #3 & 4 Bypass Valve Control
Raw Water Intake Structure telemetry
Watershed Reservoir Telemetry & Valve control – not Phase 1
Monitoring of PRV stations on Flowline
Ridges Irrigation Pump Station – not Phase 1
Mantey Heights flow meter – not Phase 1

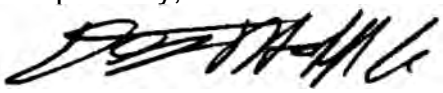
A. Information for Phase 1 sites in question has been listed above; sites with an asterisk (*) are located within the City WTP compound. If information has not been listed (ie. Mantey Heights), it is anticipated to be in a later phase.

33. Q. We would like to request an additional site visit to the Grand Junction Water Treatment Plant as well as the Kannah Creek Plant. We believe that it is our duty as an integrations company to do a thorough investigation of all control processes currently implemented to give the most comprehensive and sustainable course of action for current and future controls needs. It is our goal to be able to put forth the most competitive, accurate and accommodating bid as possible. However, to do such we would like some additional information that would be best gathered through another on site visit. The additional information that we believe is pertinent to the design and future allocation of controls is below.
    - Current make and model of RTU's/FIU Phoenix Radio 900 MHz
    - Information regarding telemetry system, network map, repeaters, frequency range, etc. Listed above
    - Future sites to be added and their function Listed Above in Attachment A
    - Current make and model of PLC's at Kannah Creek Opto10
    - Current communications protocols being used by SCADA at Kannah Creek ethernet
    - Available communications out of Kannah Creek, IP/TCP, Serial, Radio, etc. Currently using IP/TCP, no Serial, Radio would definitely need a repeater
    - Current means of instrumentation measurements and control at Grand Junction WTP, 4-20mA, HART, Modbus etc. 4-20
    - Existing wiring to all control valves at the Grand Junction WTP that are to be replaced Not as part of this project. It is the City's desire as part of a later phase to move the telemetry/control of 1) Finished water tank level, 2) City 24" Flowmeter, 3) OM 24" Flowmeter, 4) Reservoir 40 HP Pump On/Off, 5) Reservoir 75 HP Pump On/Off, 6) Reservoir Pump Valve Control, & 7) Reservoir Pump Valve % to a wireless system (radio, microwave, etc.) these components are all located within the compound and are currently hard-wired. Please take this into consideration as needed capabilities with future expansion.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,



Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado

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	TEMP		

PROGRAM COMMENTS

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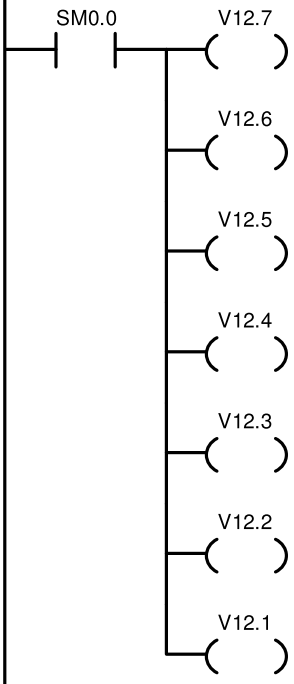
Network Comment



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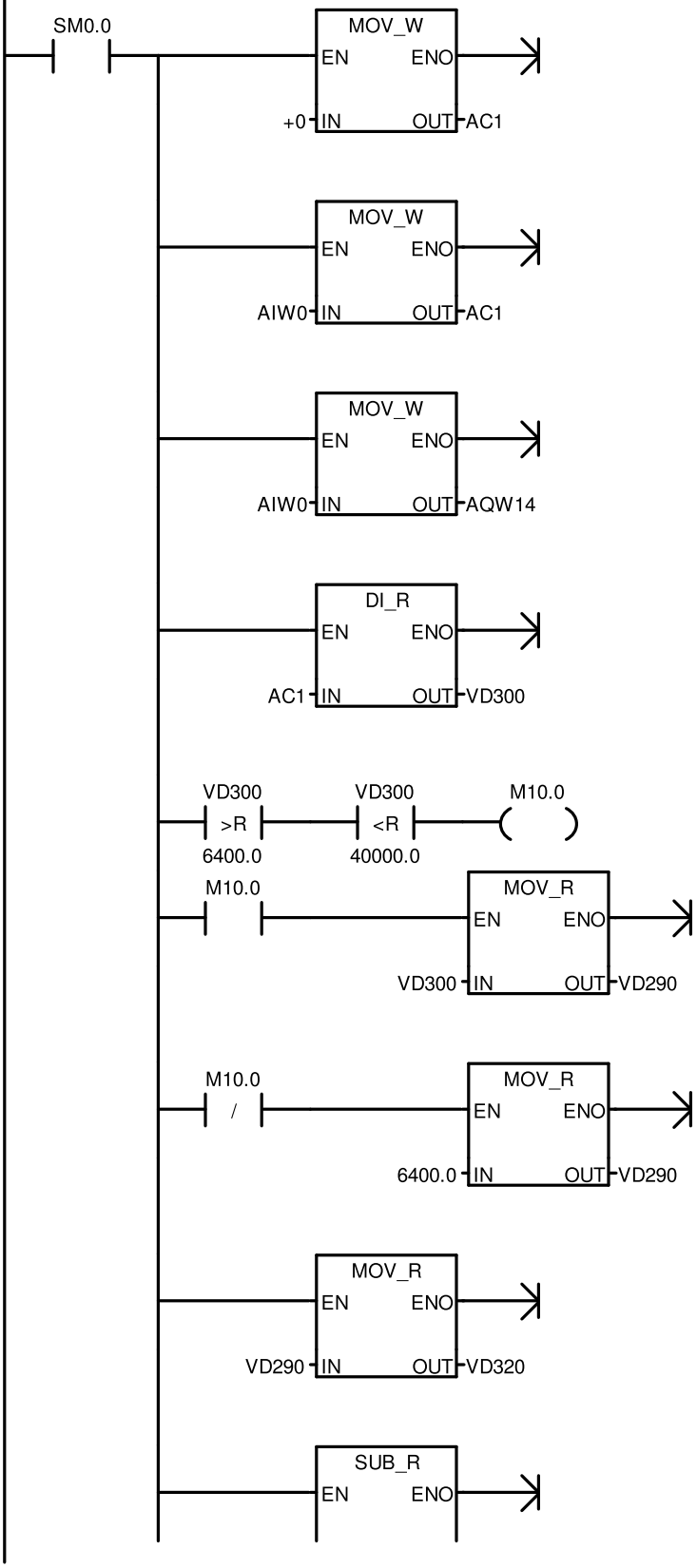

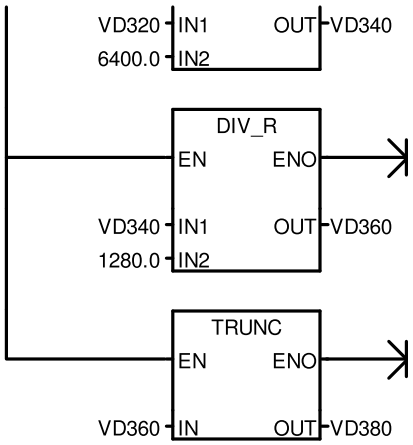
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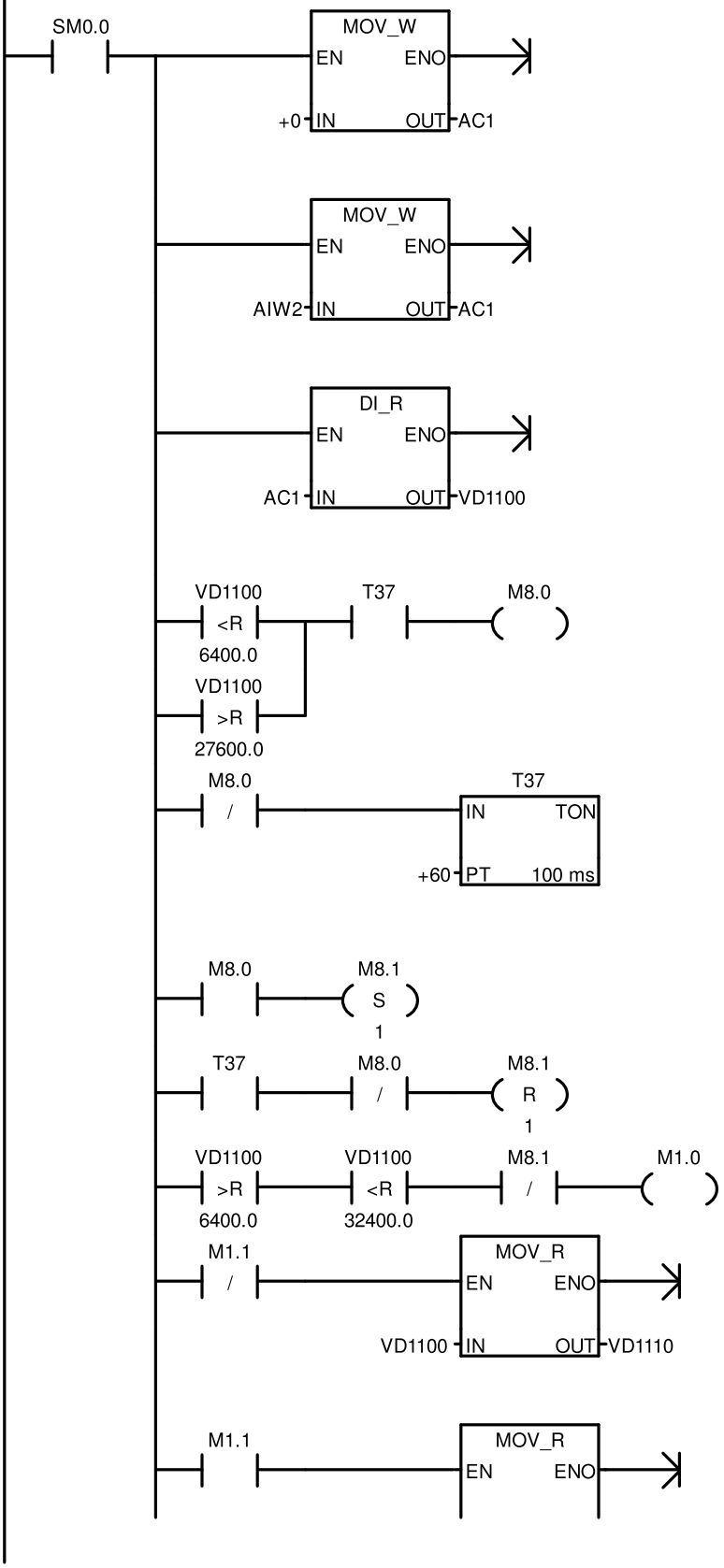

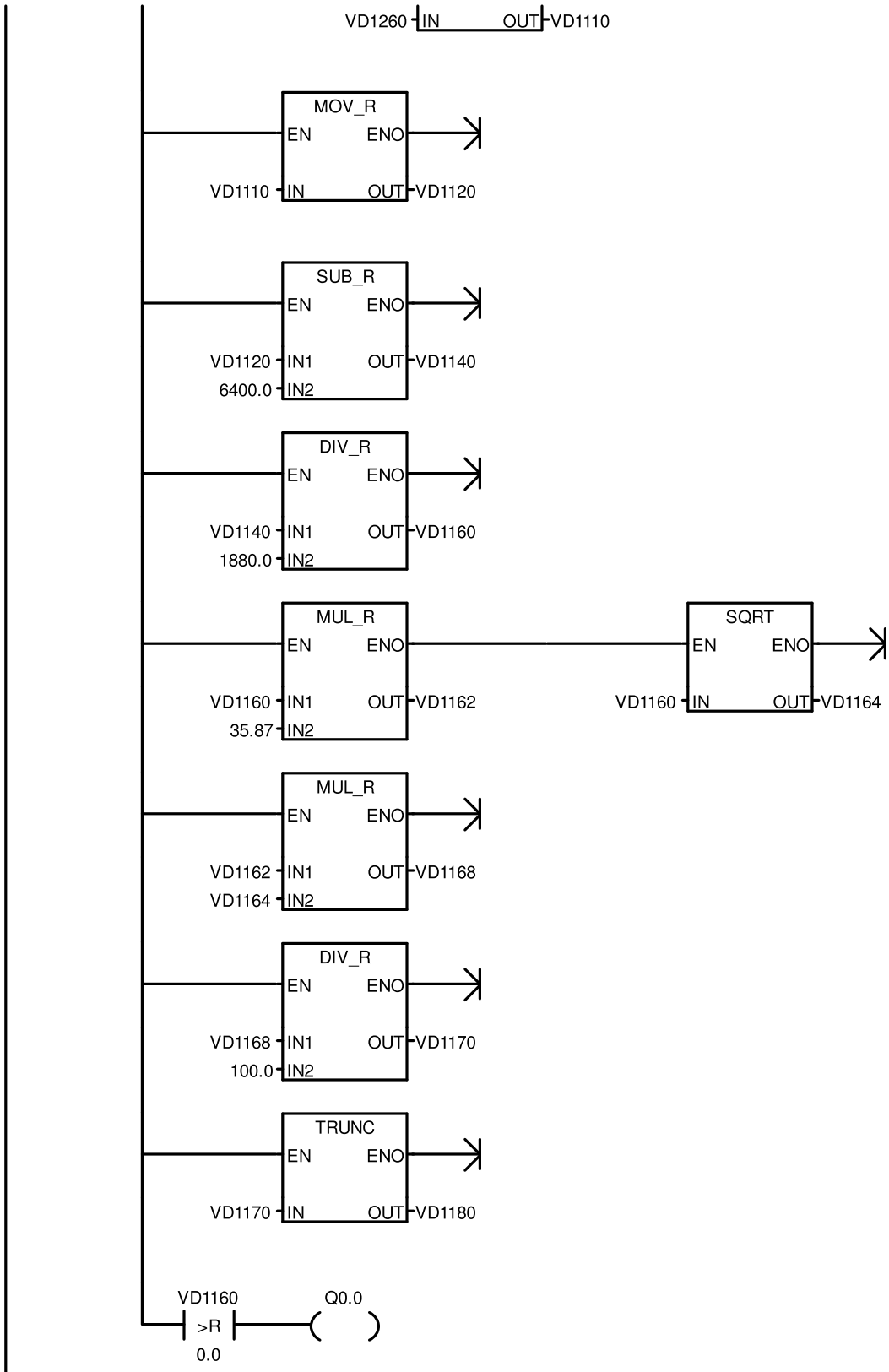
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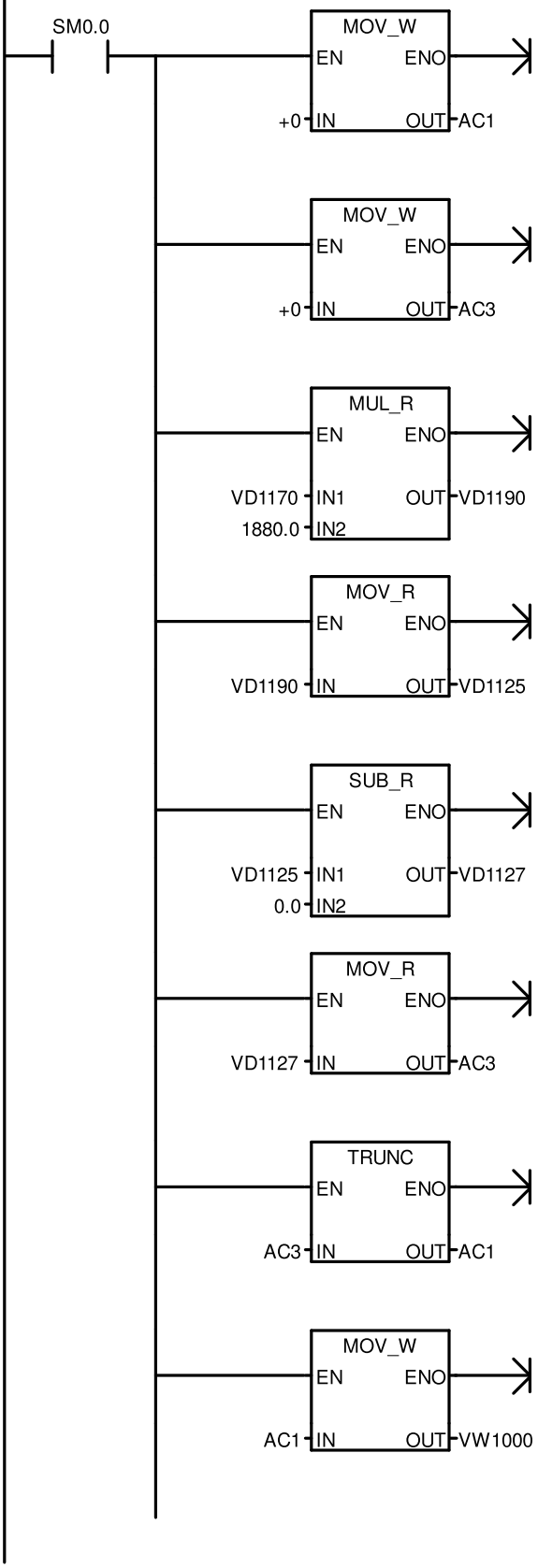

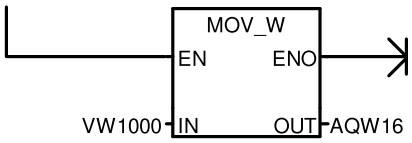
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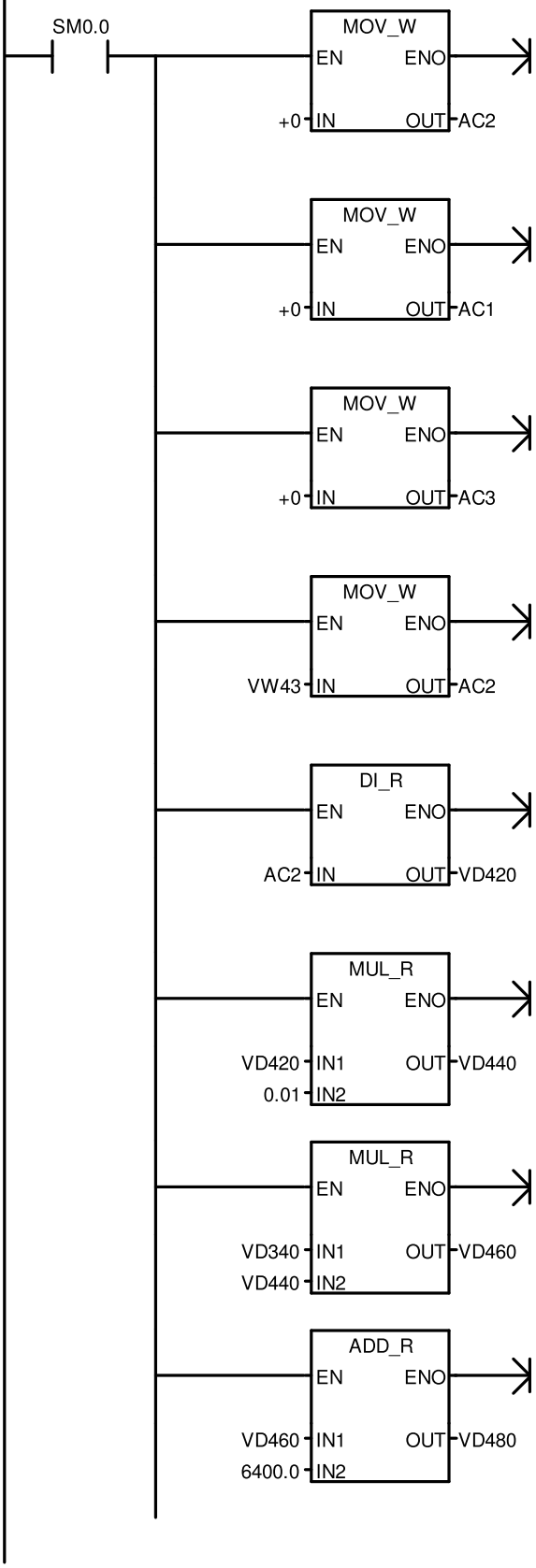
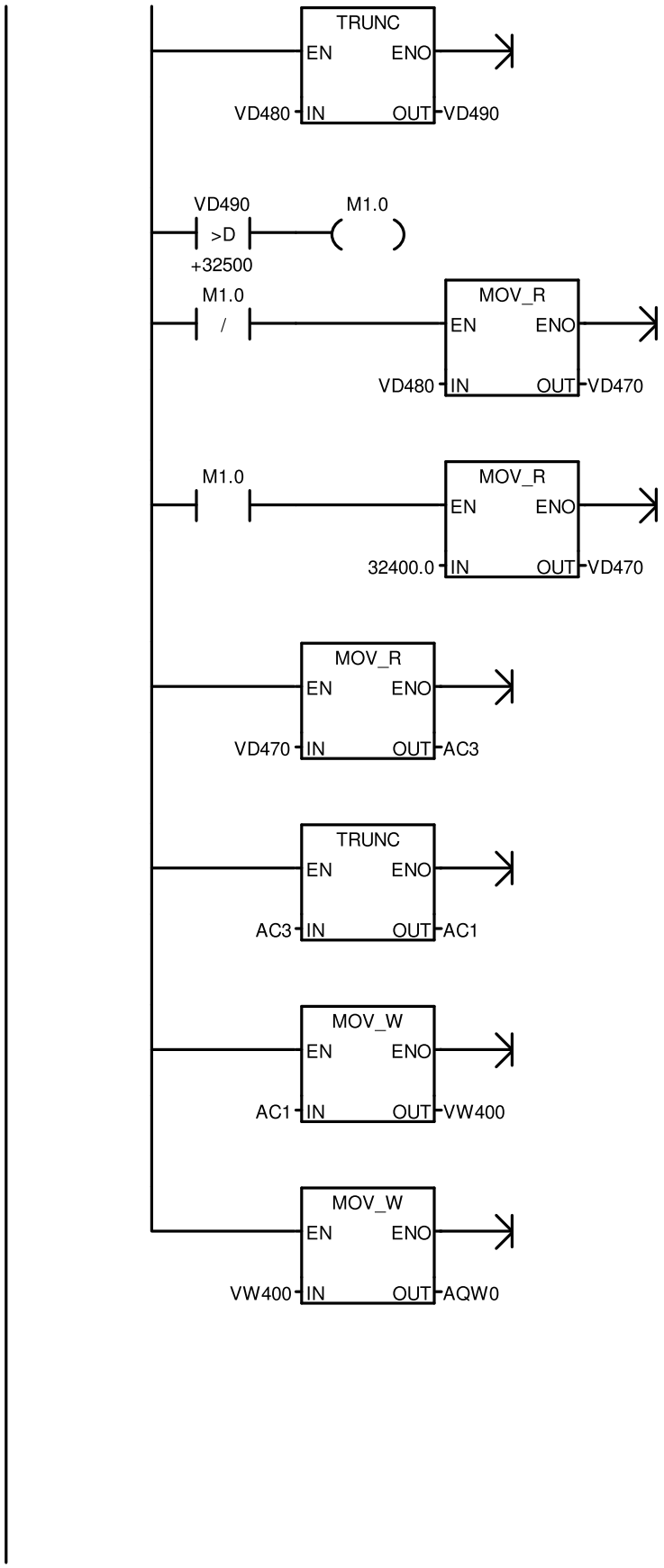
Network 5 ACH Feed Control

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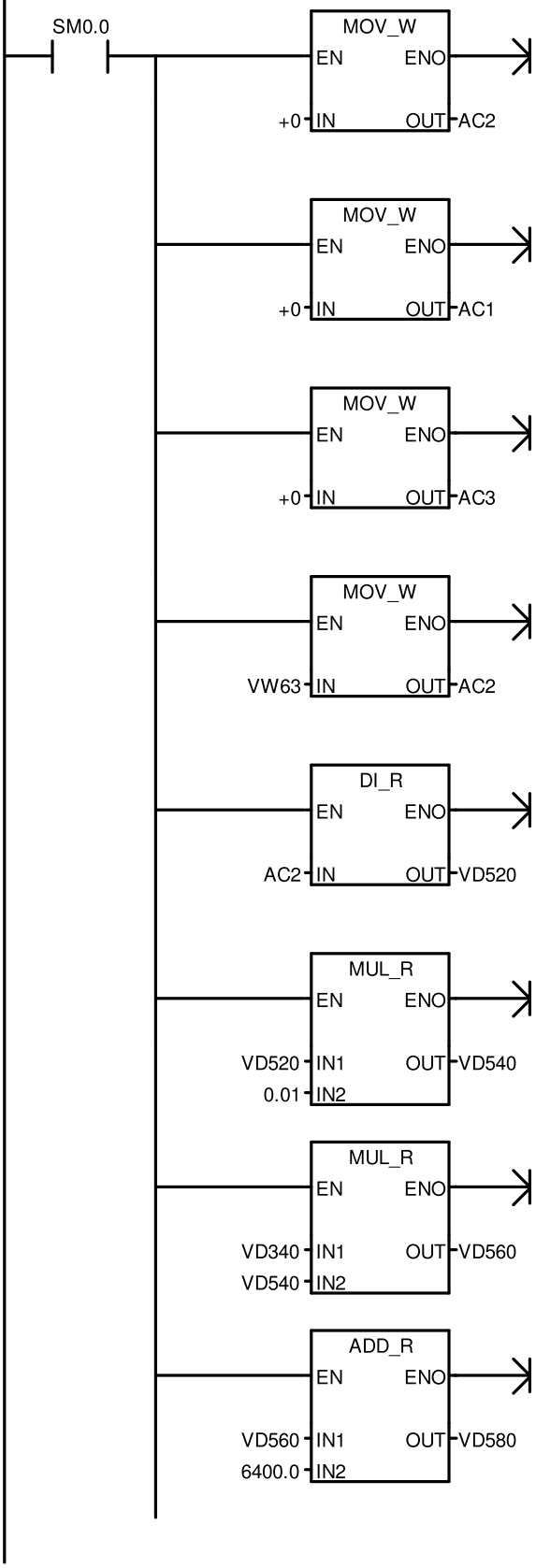
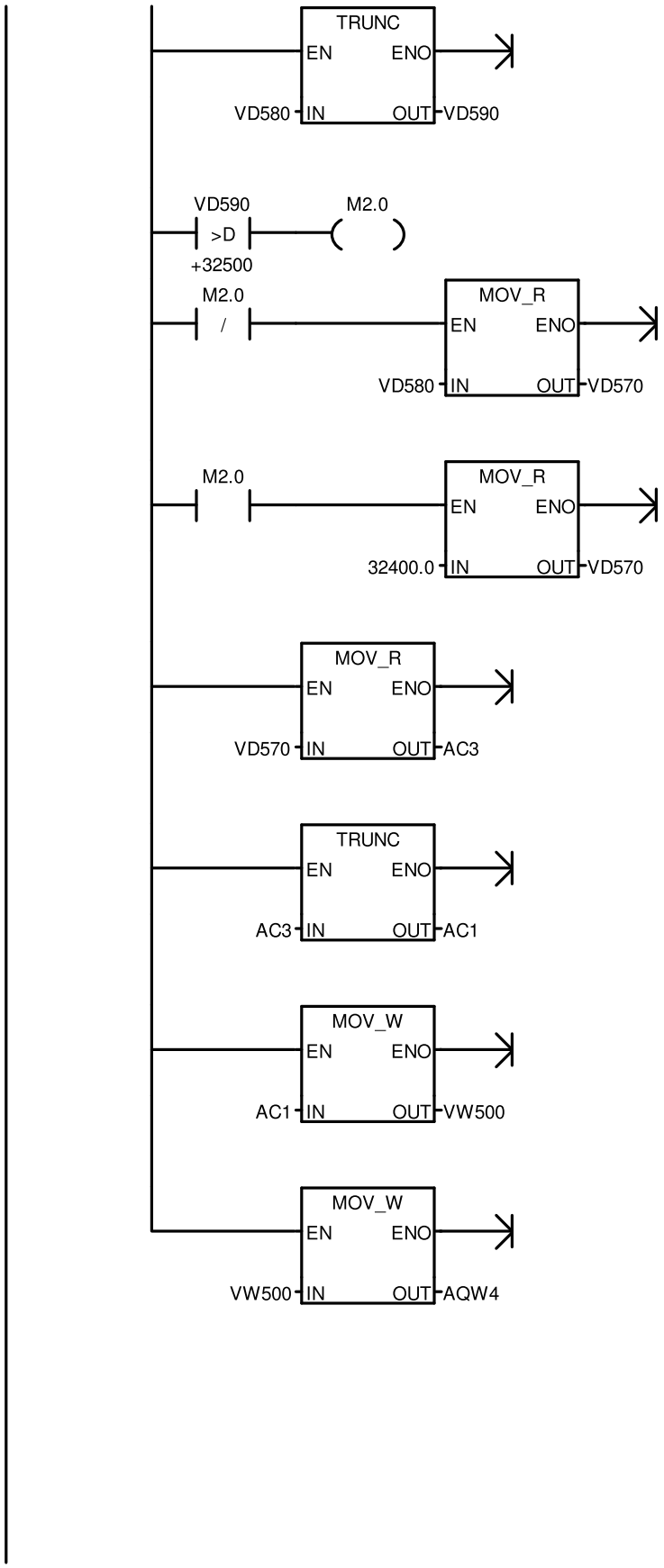
Network 6 Cpoly Feed Control

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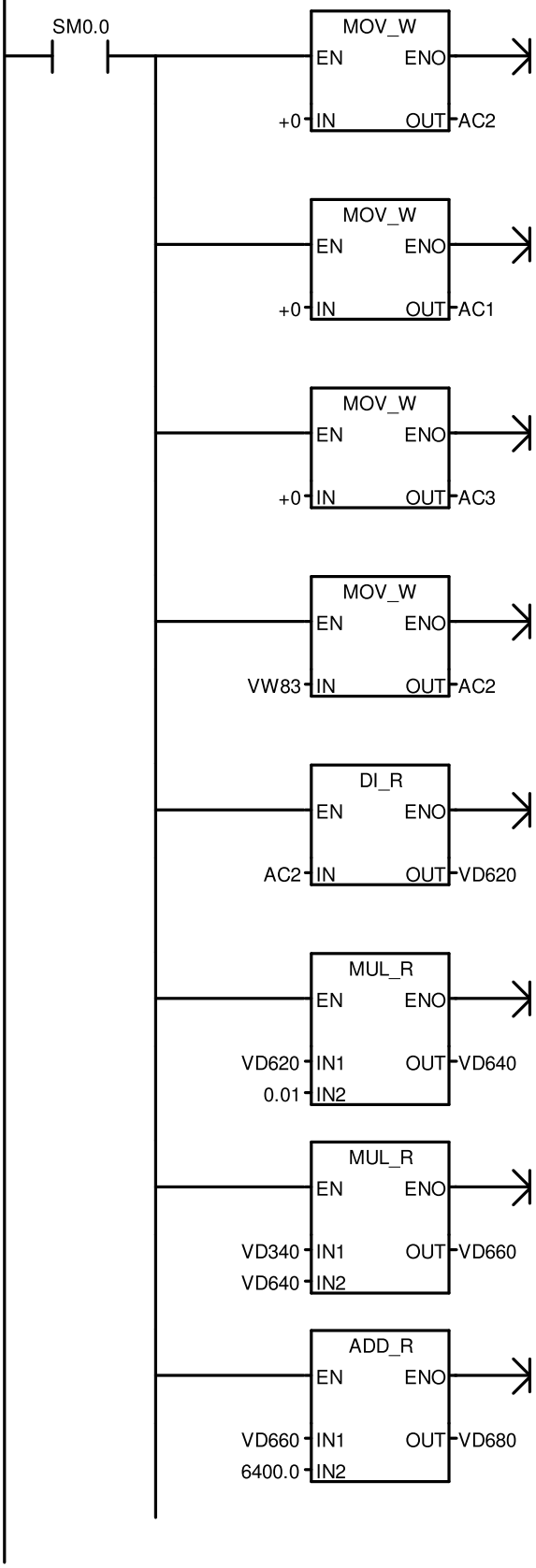
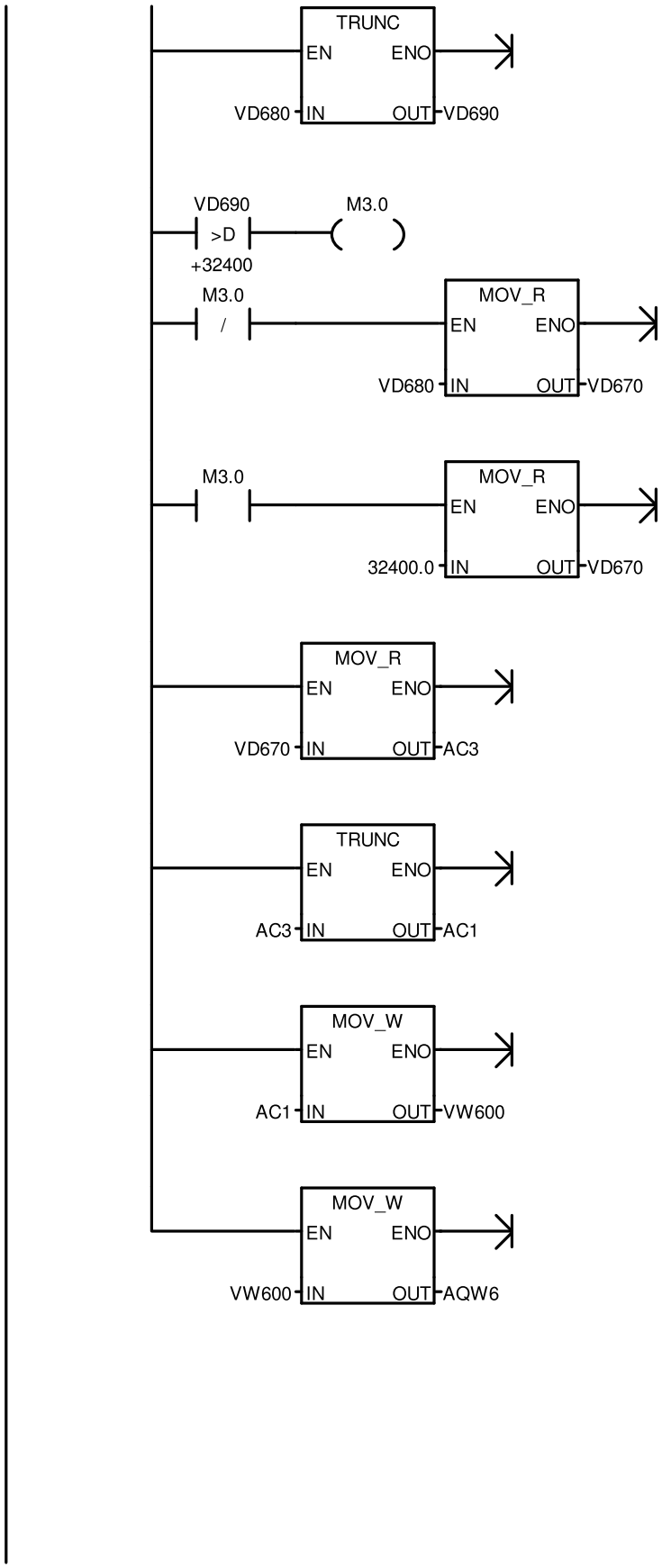
Network 7 Filter Aid Feed Control

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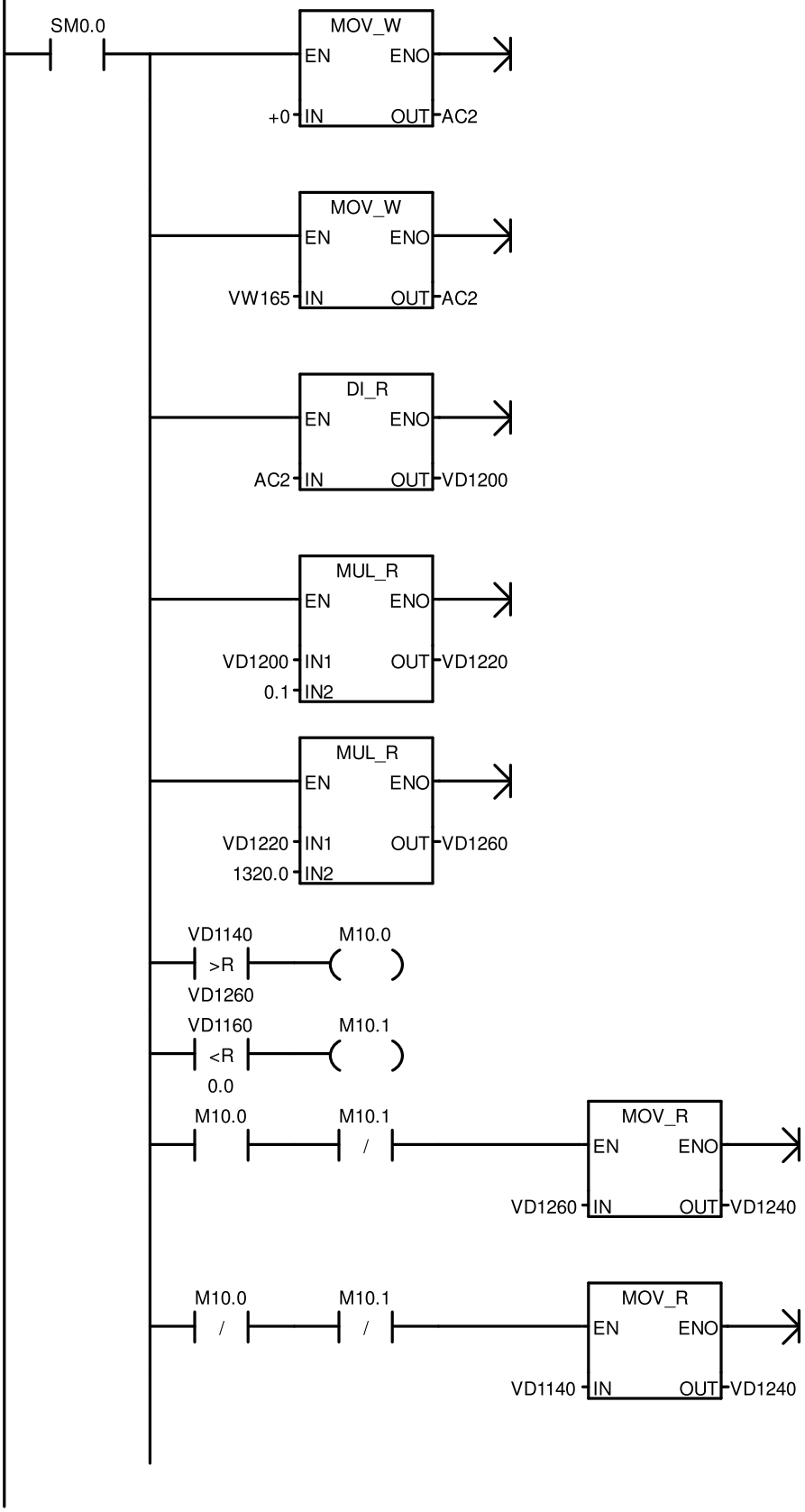

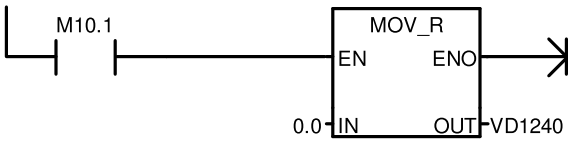
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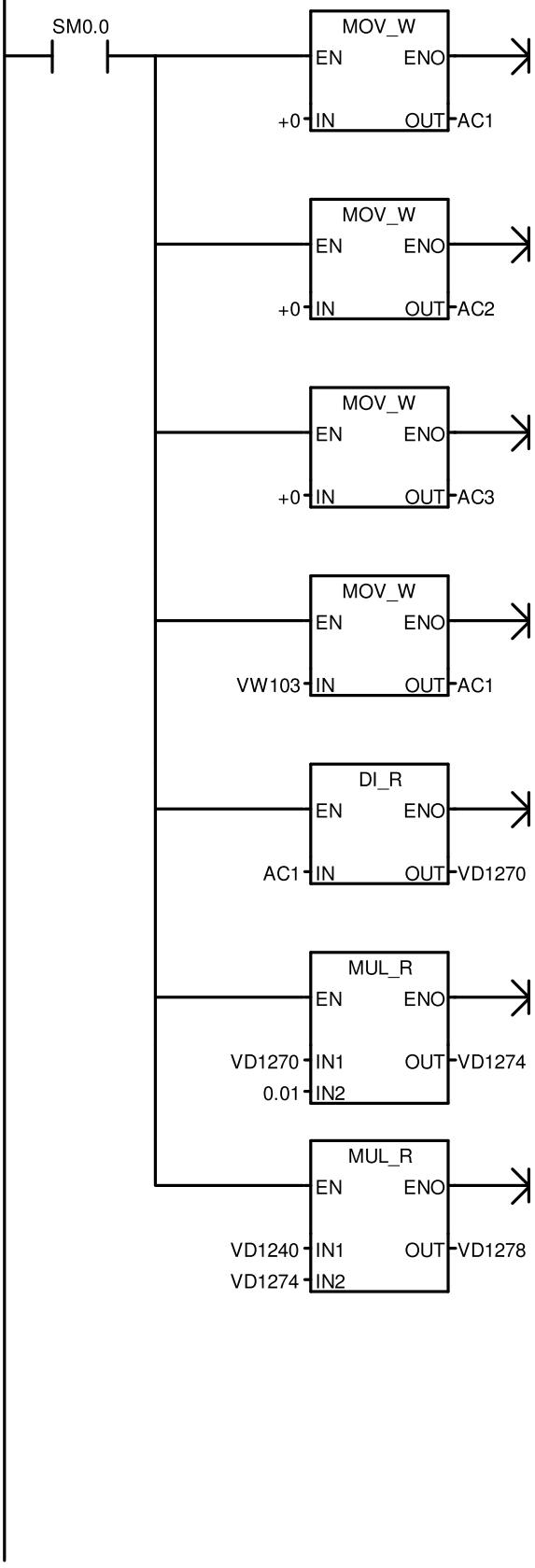
Network 9 Flouride Feed Control



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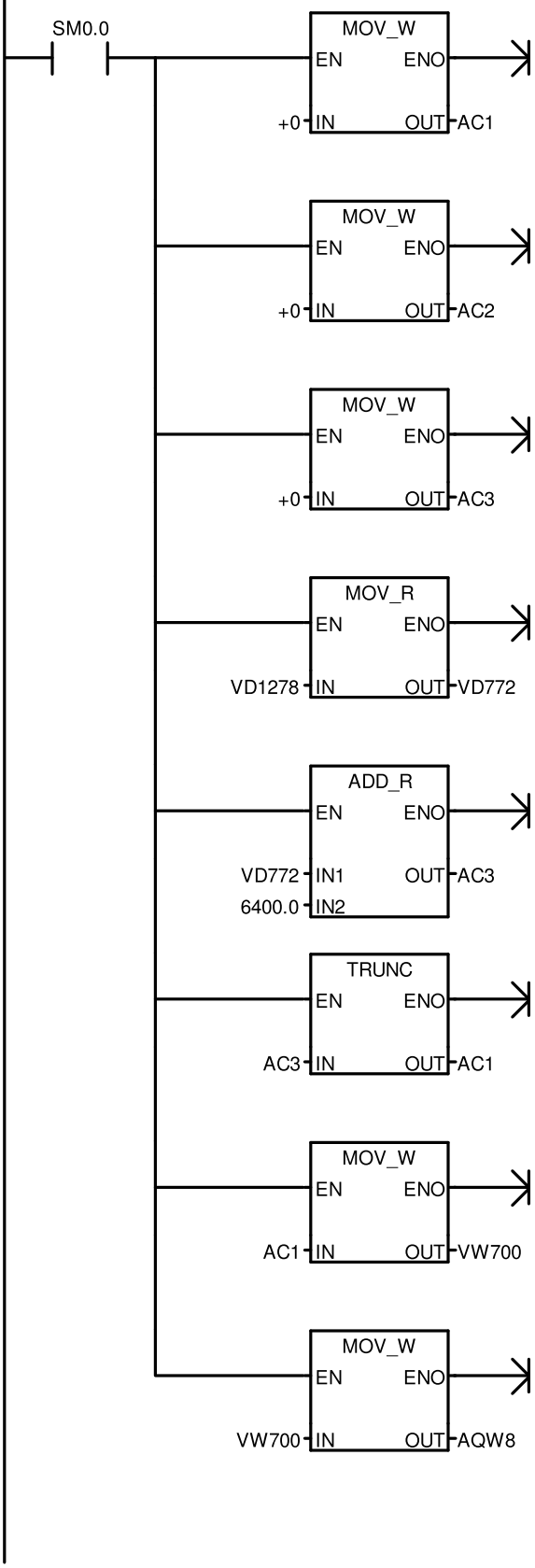
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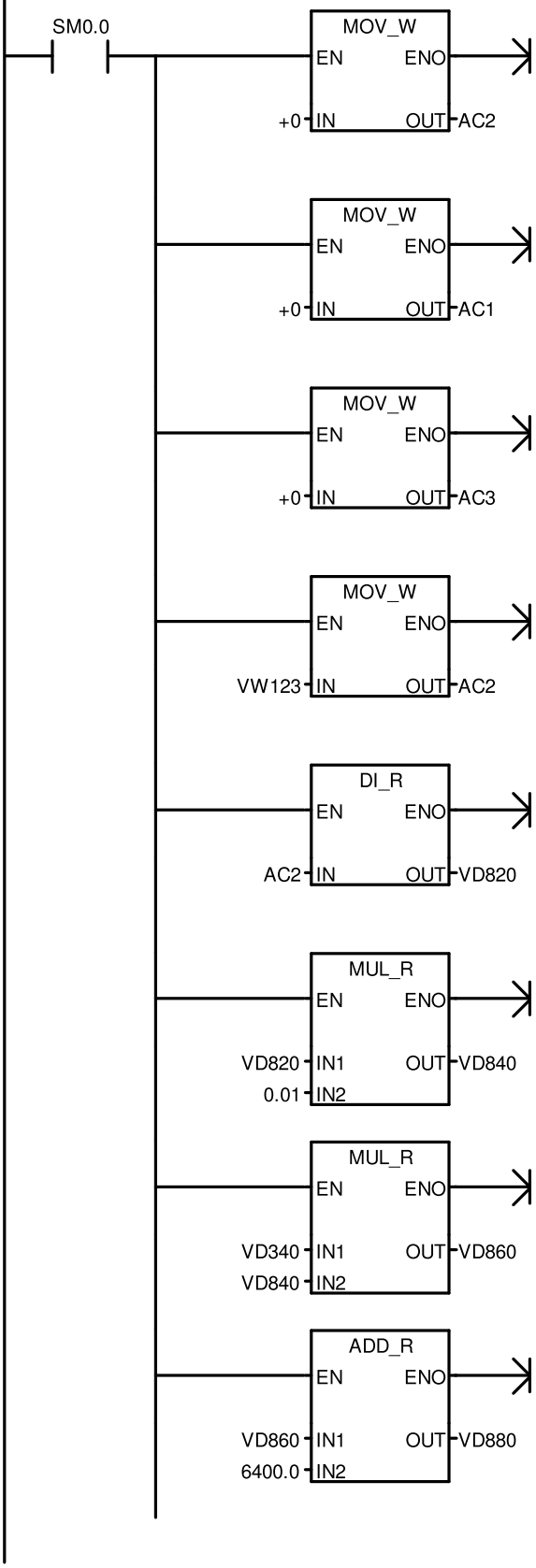
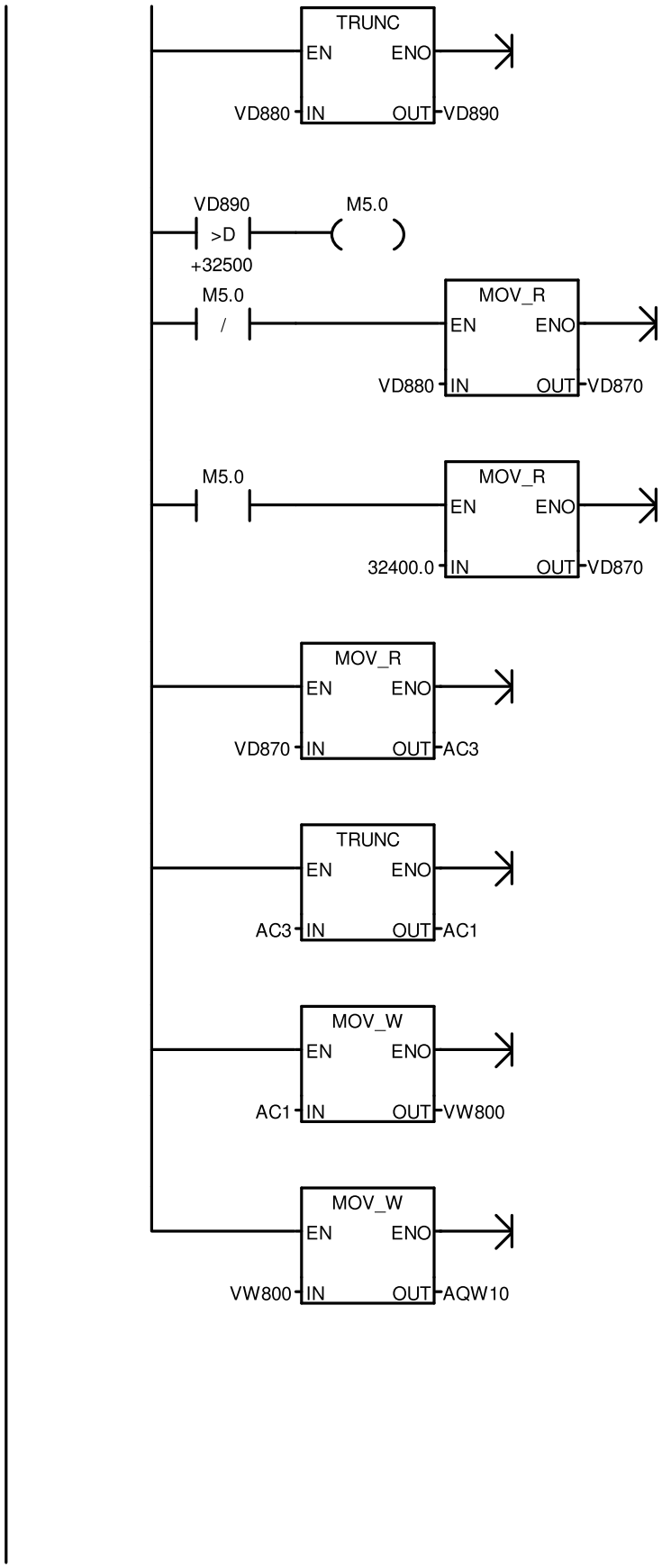
Network 11 Pre Chlorine Feed Control

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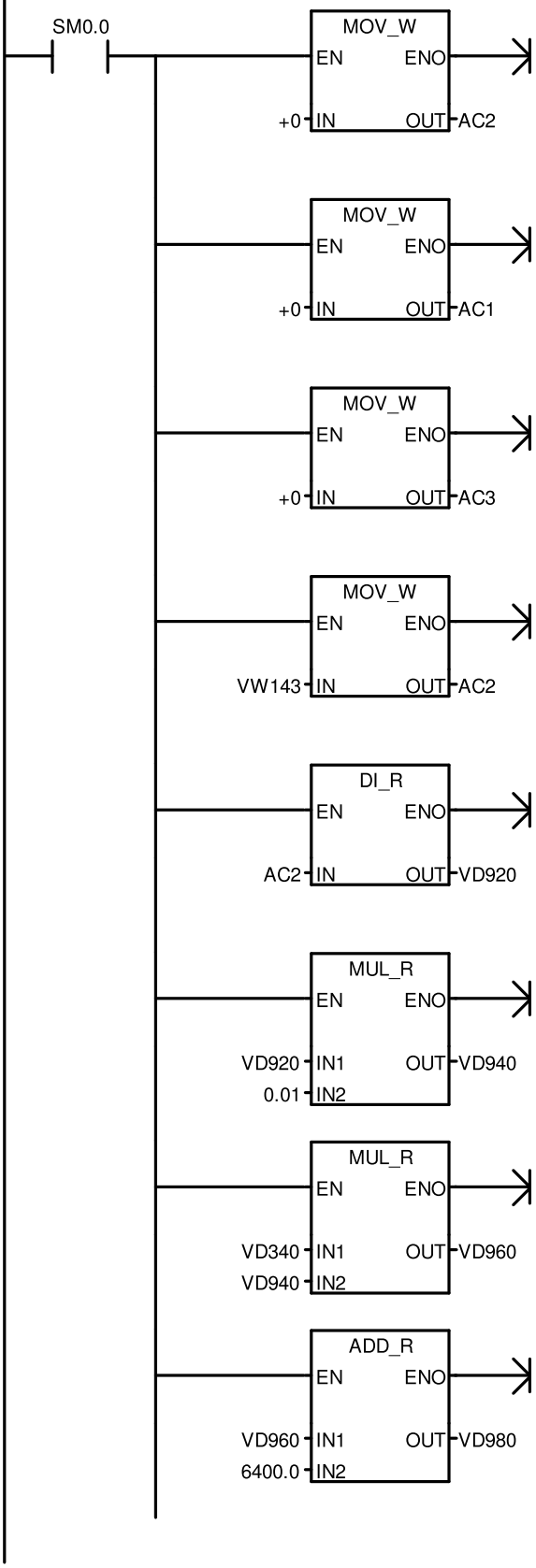
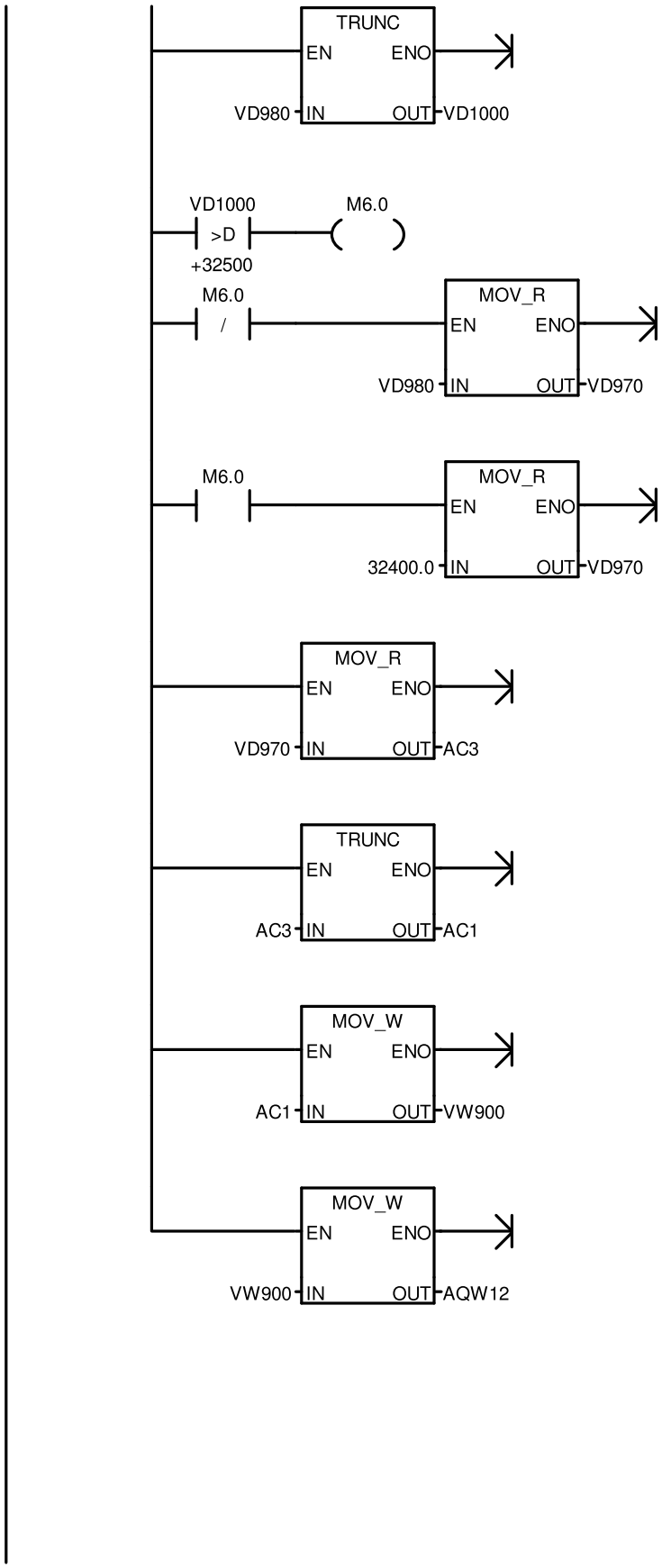
Network 12 Post Chlorine Feed Control




TRUNC
EN
ENO
VD980
IN
OUT
VD1000
VD1000
>D
+32500
M6.0
M6.0
/
MOV_R
EN
ENO
VD980
IN
OUT
VD970
M6.0
MOV_R
EN
ENO
32400.0
IN
OUT
VD970
MOV_R
EN
ENO
VD970
IN
OUT
AC3
TRUNC
EN
ENO
AC3
IN
OUT
AC1
MOV_W
EN
ENO
AC1
IN
OUT
VW900
MOV_W
EN
ENO
VW900
IN
OUT
AQW12

Network 13 Network Title

Network Comment

Block: SBR_0
Author:
Created: 04/13/2009 03:01:14 pm
Last Modified: 05/19/2009 08:39:15 am

Symbol	Var Type	Data Type	Comment
EN	IN	BOOL	
	IN		
	IN_OUT		
	OUT		
	TEMP		

SUBROUTINE COMMENTS

Network 1 Network Title

Network Comment

Block: INT_0
Author:
Created: 04/13/2009 03:01:14 pm
Last Modified: 05/19/2009 08:39:15 am

Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

INTERRUPT ROUTINE COMMENTS

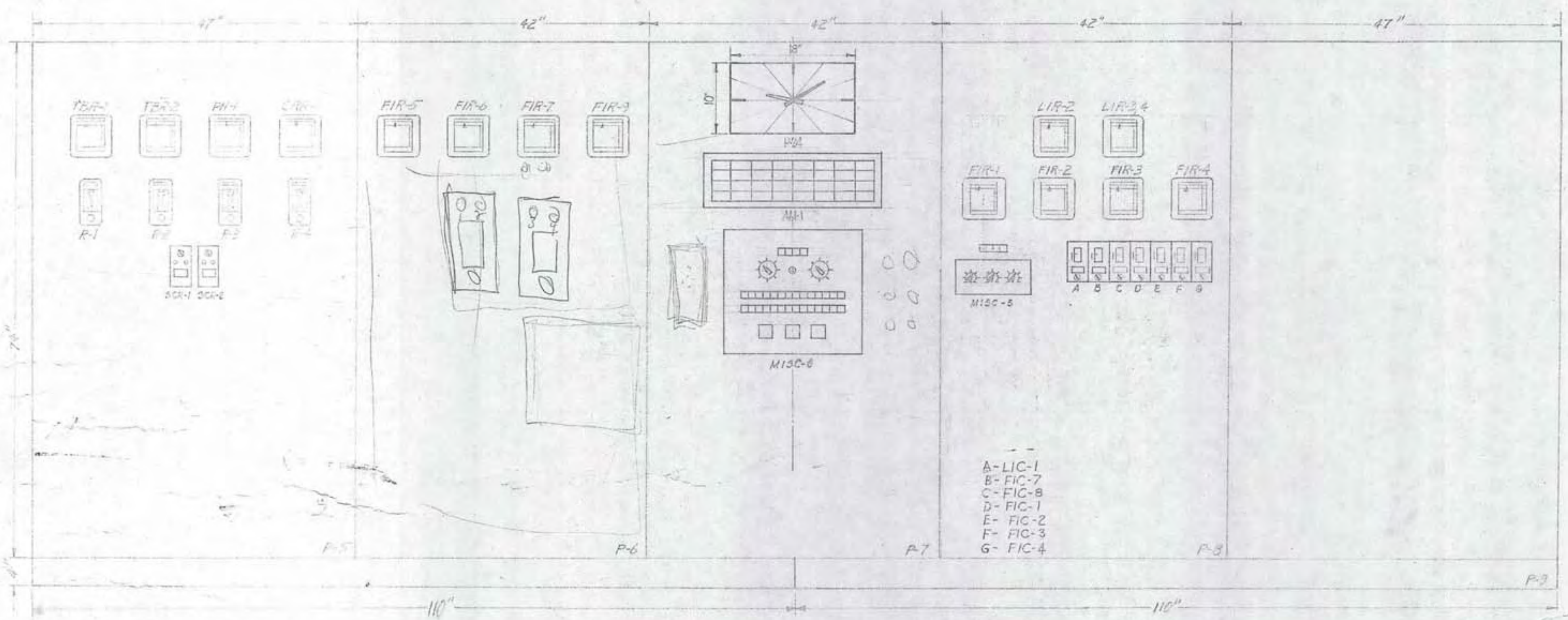
Network 1 Network Title

Network Comment

```
VB0    16#54
VB1    16#44
VB2    16#10
VB3    16#30
VB4    16#07
VB5    16#00
VB6    16#00
VB7    16#20
VB8    16#00
VB9    16#0C
VB10   16#00
VB11   16#00
VB12   16#00
VB13   16#00
VB14   16#00
VB15   16#00
VB16   16#00
VB17   16#00
VB18   16#00
VB19   16#00
VB20   16#00
VB21   16#00
VB22   16#00
VB23   16#00
VB24   16#00
VB25   16#00
VB26   16#00
VB27   16#00
VB28   16#00
VB29   16#00
VB30   16#00
VB31   16#00
VB32   16#41
VB33   16#43
VB34   16#48
VB35   16#20
VB36   16#20
VB37   16#20
VB38   16#20
VB39   16#20
VB40   16#20
VB41   16#10
VB42   16#10
VB43   16#00
VB44   16#00
VB45   16#25
VB46   16#20
VB47   16#20
VB48   16#20
VB49   16#20
VB50   16#20
VB51   16#20
VB52   16#43
VB53   16#50
VB54   16#4F
VB55   16#4C
VB56   16#59
VB57   16#20
VB58   16#20
VB59   16#20
VB60   16#20
VB61   16#10
VB62   16#10
VB63   16#00
VB64   16#00
VB65   16#25
VB66   16#20
VB67   16#20
```

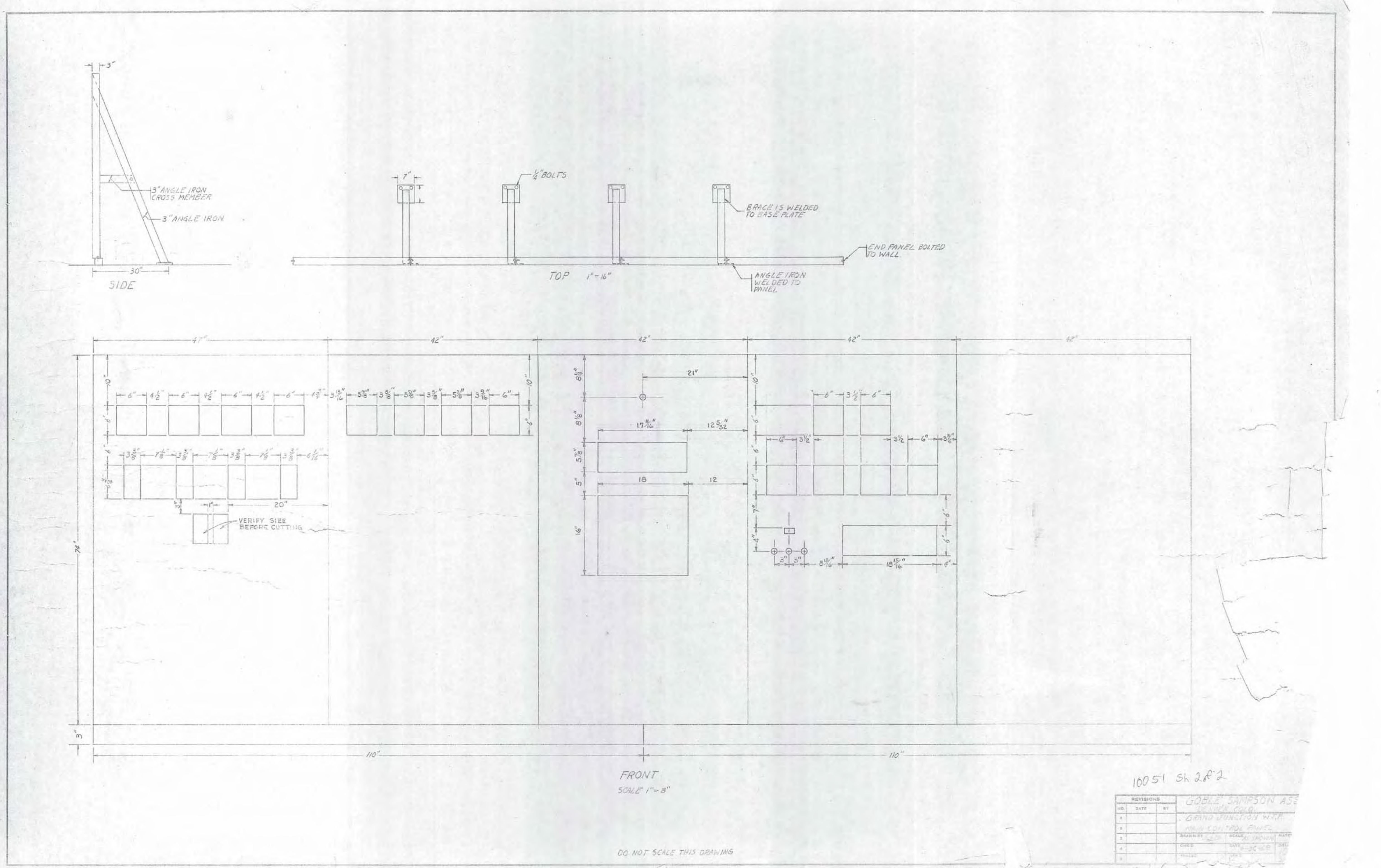
```
VB68   16#20
VB69   16#20
VB70   16#20
VB71   16#20
VB72   16#46
VB73   16#41
VB74   16#20
VB75   16#20
VB76   16#20
VB77   16#20
VB78   16#20
VB79   16#20
VB80   16#20
VB81   16#10
VB82   16#10
VB83   16#00
VB84   16#00
VB85   16#25
VB86   16#20
VB87   16#20
VB88   16#20
VB89   16#20
VB90   16#20
VB91   16#20
VB92   16#46
VB93   16#4C
VB94   16#52
VB95   16#44
VB96   16#45
VB97   16#20
VB98   16#20
VB99   16#20
VB100  16#20
VB101  16#10
VB102  16#10
VB103  16#00
VB104  16#00
VB105  16#25
VB106  16#20
VB107  16#20
VB108  16#20
VB109  16#20
VB110  16#20
VB111  16#20
VB112  16#50
VB113  16#43
VB114  16#4C
VB115  16#32
VB116  16#20
VB117  16#20
VB118  16#20
VB119  16#20
VB120  16#20
VB121  16#10
VB122  16#10
VB123  16#00
VB124  16#00
VB125  16#25
VB126  16#20
VB127  16#20
VB128  16#20
VB129  16#20
VB130  16#20
VB131  16#20
VB132  16#50
VB133  16#53
VB134  16#54
VB135  16#43
```

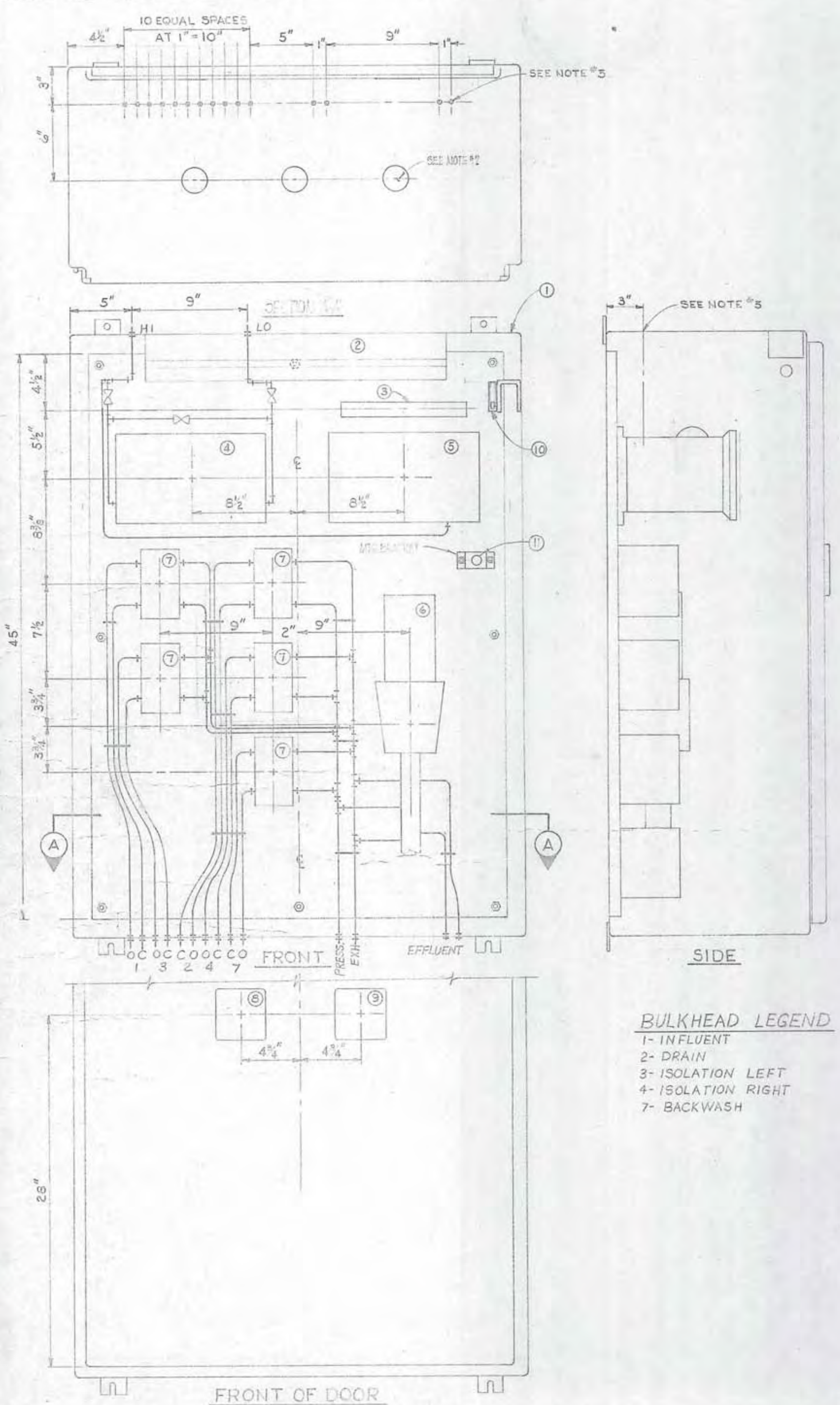
```
VB136  16#4C
VB137  16#20
VB138  16#20
VB139  16#20
VB140  16#20
VB141  16#10
VB142  16#10
VB143  16#00
VB144  16#00
VB145  16#25
VB146  16#20
VB147  16#20
VB148  16#20
VB149  16#20
VB150  16#20
VB151  16#20
VB152  16#46
VB153  16#4C
VB154  16#32
VB155  16#20
VB156  16#4C
VB157  16#49
VB158  16#4D
VB159  16#49
VB160  16#54
VB161  16#20
VB162  16#20
VB163  16#10
VB164  16#11
VB165  16#00
VB166  16#00
VB167  16#20
VB168  16#4D
VB169  16#47
VB170  16#44
VB171  16#20
```



10051
sh 1 of 2

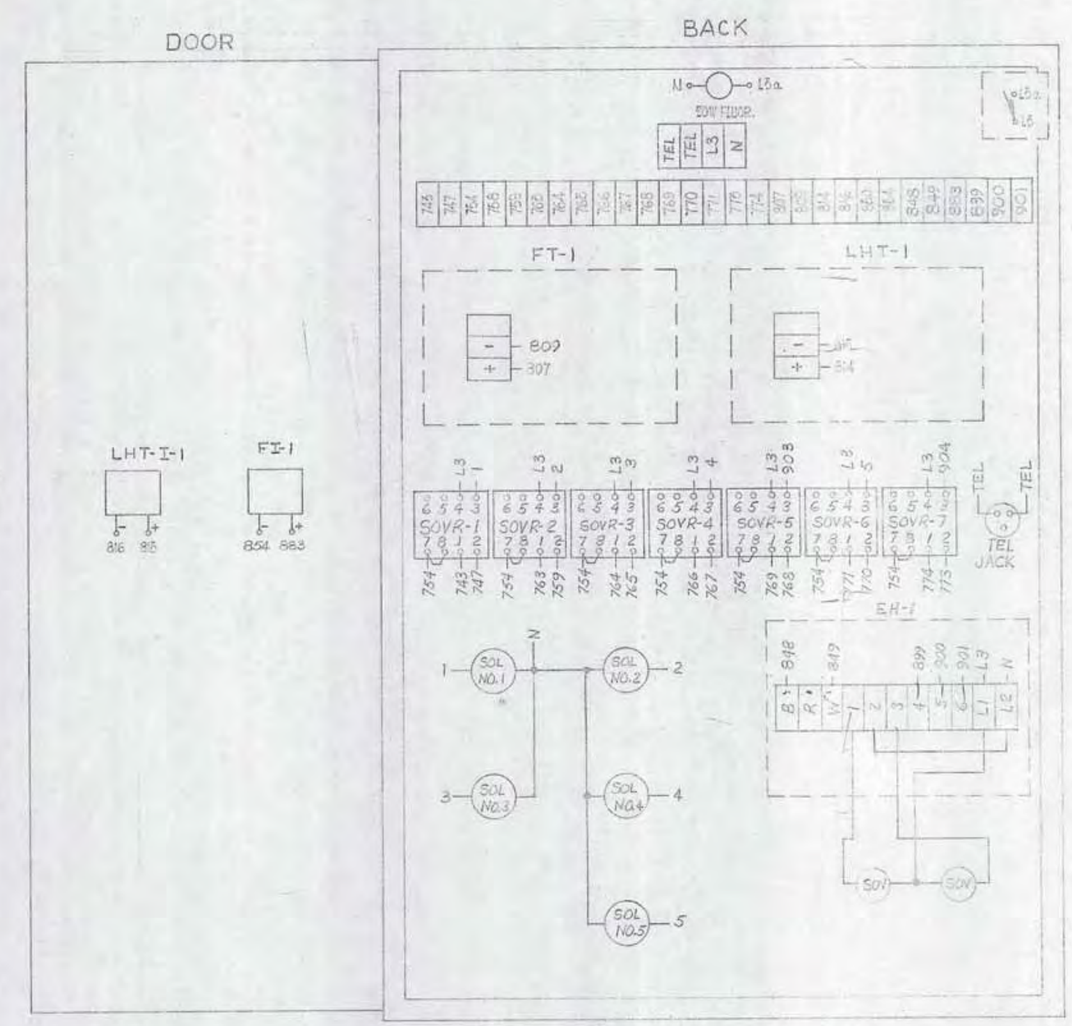
DO NOT SCALE THIS DRAWING


3" ANGLE IRON CROSS MEMBER
3" ANGLE IRON
SIDE
1/2" BOLTS
BRACE IS WELDED TO BASE PLATE
END PANEL BOLTED TO WALL
ANGLE IRON WELDED TO PANEL
TOP 1" = 16"
VERIFY SIZE BEFORE CUTTING
FRONT
SCALE 1" = 8"
DO NOT SCALE THIS DRAWING
10051 Sh 2 of 2
REVISIONS
NO.
DATE
BY
GOBLE SAMPSON ASS
GRAND JUNCTION W.T.P.
MAIN CONTROL PANEL



BULKHEAD LEGEND

1- INFLUENT
2- DRAIN
3- ISOLATION LEFT
4- ISOLATION RIGHT
7- BACKWASH



CONNECTION DIAGRAM

EQUIPMENT LEGEND

1. HOFFMAN #A-483416-NEMA-12 ENCLOSURE.
2. STRIP LIGHT-SUPER STRIP ELECTROLIER #K201-24 20W W/LAMP.
3. TERMINAL STRIP, 300V. ALLEN-BRADLEY #1492-F3.
4. FT-1 FILTER EFFLUENT FLOW XTMR
5. LHT-1 FILTER LOSS OF HEAD XTMR
6. EH-1 FILTER ELECTRIC-HYDRAULIC POSITIONER
7. SOV-1, 2, 3, 4 & 7 BUTTERFLY VALVE OPEN-CLOSE SOLENOID.
8. FT-I-1 FILTER EFFLUENT FLOW INDICATOR
9. LHT-I-1 FILTER LOSS OF HEAD INDICATOR
10. SNAP SWITCH ROBERTSHAW #BRD2-1P-15.
11. TELEPHONE JACK, CANNON [illegible]
12. SOVR-1, 2, 3, 4, 5, 6, 7 LINE ELECTRIC RLP RELAY.

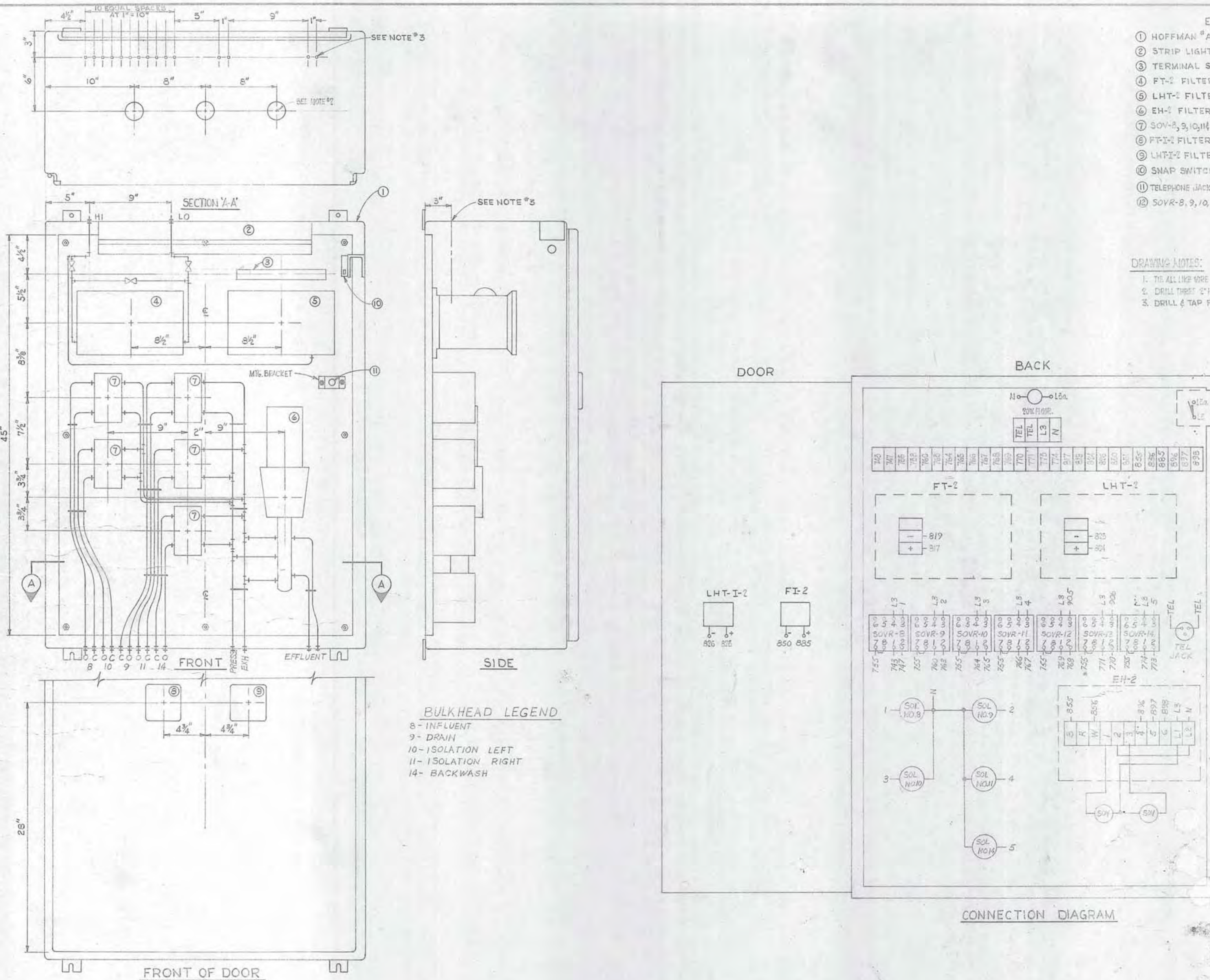
DRAWING NOTES:

1. TIE ALL LIKE WIRE NUMBERS COMMON.
2. DRILL THREE 2" HOLES IN BOTTOM OF BOX FOR DRAIN PURPOSES.
5. DRILL & TAP FOR 3/8" BULK HEAD FITTING.

10052 Sh 1 of 4

REVISIONS		
NO.	DATE	BY
1	7-30-68	RCD
2	2-26-69	DLZ
3	3-6-69	DLZ
4	3-26-69	DLZ

GOBLE SAMPSON ASSOC.



BULKHEAD LEGEND
8 - INFLUENT
9 - DRAIN
10 - ISOLATION LEFT
11 - ISOLATION RIGHT
14 - BACKWASH

EQUIPMENT LEGEND

1. HOFFMAN #A-483616-NEMA-12 ENCLOSURE.
2. STRIP LIGHT-SUPER STRIP ELECTROLIER # K201-24 20W W/LAMP.
3. TERMINAL STRIP, 300V. ALLEN-BRADLEY # 1492-F8.
4. FT-2 FILTER EFFLUENT FLOW XTMR
5. LHT-2 FILTER LOSS OF HEAD XTMR
6. EH-2 FILTER ELECTRIC-HYDRAULIC POSITIONER
7. SOV-8, 9, 10, 11 & 14 BUTTERFLY VALVE OPEN-CLOSE SOLENOID.
8. FT-I-2 FILTER EFFLUENT FLOW INDICATOR - 0-4 MGD
9. LHT-I-2 FILTER LOSS OF HEAD INDICATOR - 0-12 FT
10. SNAP SWITCH ROBERTSHAW # BRD2-1P-15.
11. TELEPHONE JACK, CANNON # XLR-3-14H (MATES W/PLUG # XLR-3-11C).
12. SOVR-8, 9, 10, 11, 12, 13, 14 LINE ELECTRIC RLP RELAY.

DRAWING NOTES:

1. TIE ALL LIKE WIRE NUMBERS COMMON.
2. DRILL THREE 2" HOLES IN BOTTOM OF BOX FOR DRAIN PURPOSES.
3. DRILL & TAP FOR 3/8" BULK HEAD FITTING.

10052 Sh 2 of 4

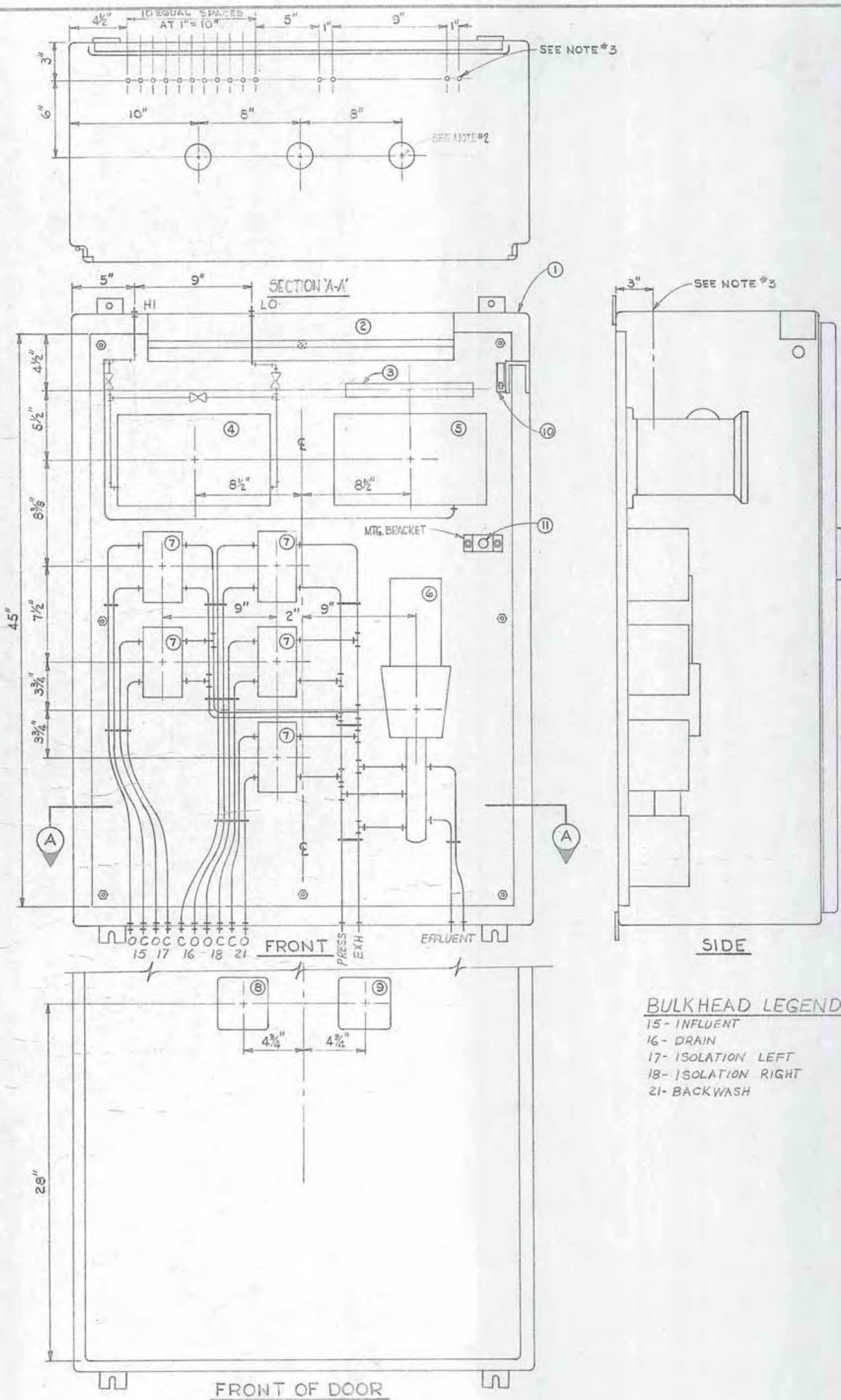
REVISIONS		
NO.	DATE	BY
1	7-30-68	RCD
2	2-26-69	DLZ
3	3-4-69	DLZ
4	3-26-69	DLZ

GOBLE SAMPSON ASSOC.

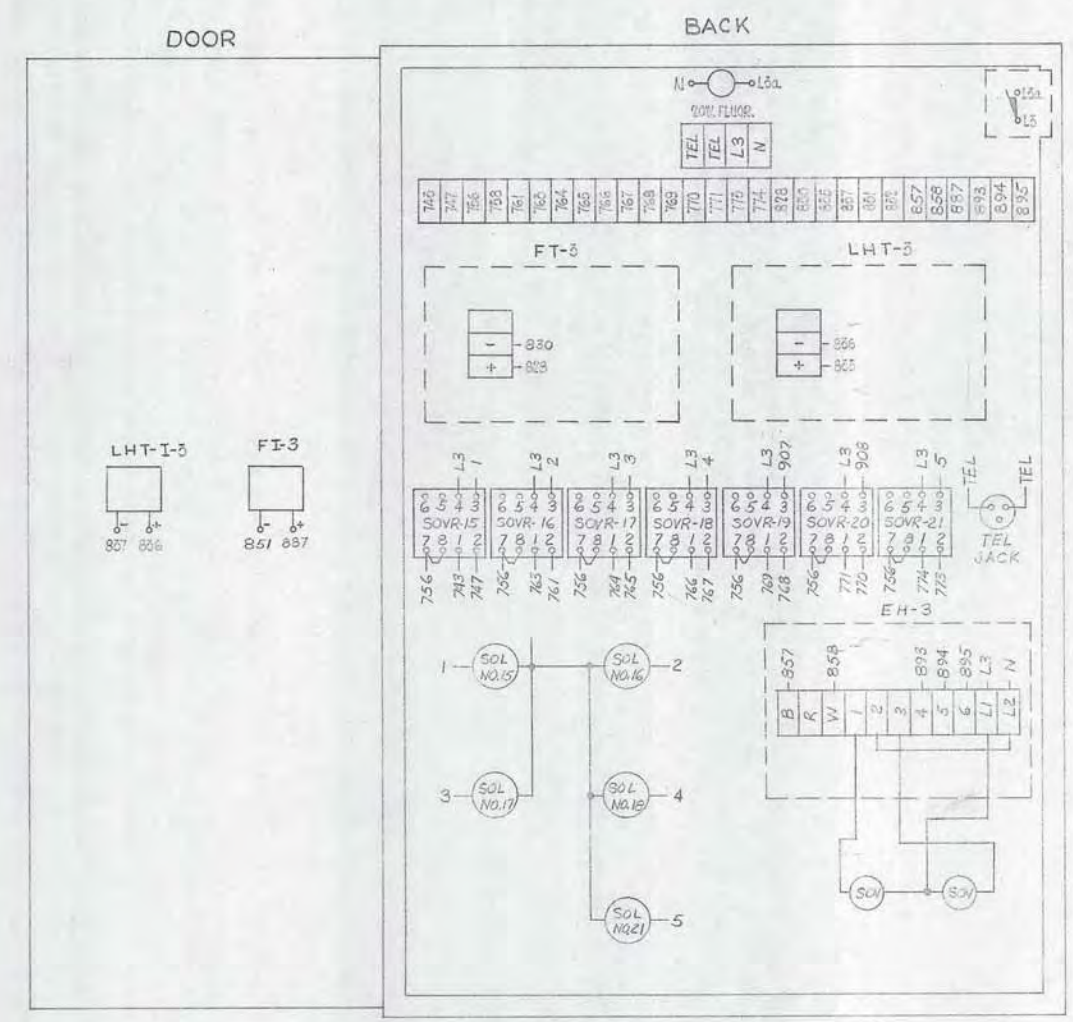
FILTER BURNHAM #2 LAYOUT & CONN. DIAG.

GRAND HOLLOW WATER TREATMENT PLANT

DRAWN BY: | SCALE: | MATERIAL
CHK'D: | DATE: | DRAWING NO.
TRACED | APP'D |



BULKHEAD LEGEND
15 - INFLUENT
16 - DRAIN
17 - ISOLATION LEFT
18 - ISOLATION RIGHT
21 - BACKWASH



CONNECTION DIAGRAM

EQUIPMENT LEGEND

1. HOFFMAN # A-483616-NEMA-12 ENCLOSURE.
2. STRIP LIGHT-SUPER STRIP ELECTROLIER # K201-24 20W W/LAMP.
3. TERMINAL STRIP, 300V. ALLEN-BRADLEY # 1492-F3.
4. FT-3 FILTER EFFLUENT FLOW XTMR
5. LHT-3 FILTER LOSS OF HEAD XTMR
6. EH-3 FILTER ELECTRIC-HYDRAULIC POSITIONER
7. SOV-15,16,17,18 & 21 BUTTERFLY VALVE OPEN-CLOSE SOLENOID.
8. FT-I-3 FILTER EFFLUENT FLOW INDICATOR
9. LHT-I-3 FILTER LOSS OF HEAD INDICATOR
10. SNAP SWITCH ROBERTSHAW # BRD2-1P-15.
11. TELEPHONE JACK, CANNON # XLR-3-14N (MATES W/PLUG # XLR-3-11C.
12. SOVR-15,16,17,18,19,20,21 LINE ELECTRIC RLP RELAY.

DRAWING NOTES:

1. TIE ALL LIKE WIRE NUMBERS COMMON.
2. DRILL THREE 2" HOLES IN BOTTOM OF BOX FOR DRAIN PURPOSES.
3. DRILL & TAP FOR 3/8" BULK HEAD FITTING.

10052 sh 3 of 4

REVISIONS		
NO.	DATE	BY
1	7-30-68	RCD
2	2-26-69	DLZ
3	3-4-69	DLZ
4	3-26-69	DLZ
5		

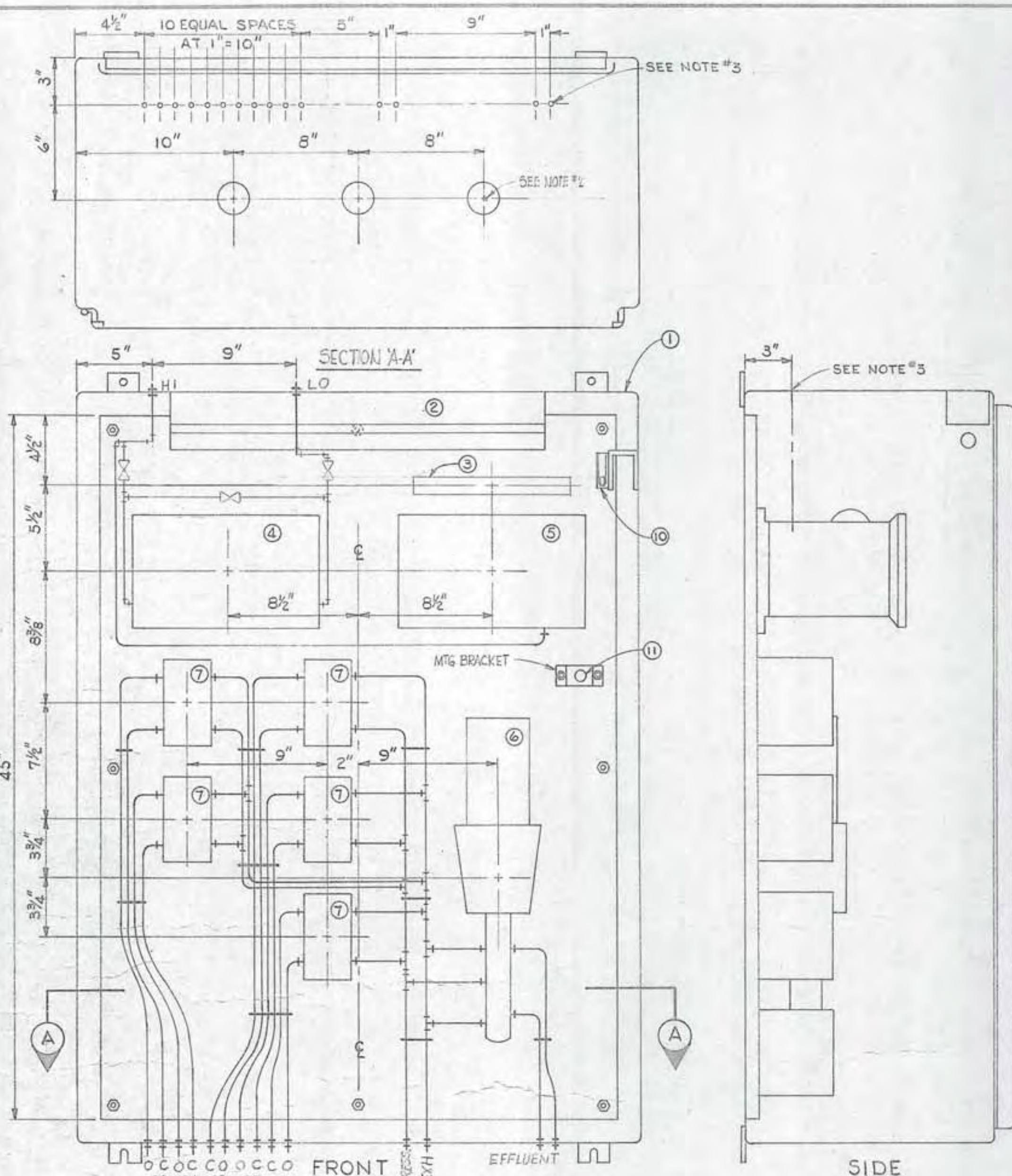
GOBLE-SAMPSON ASSOC.

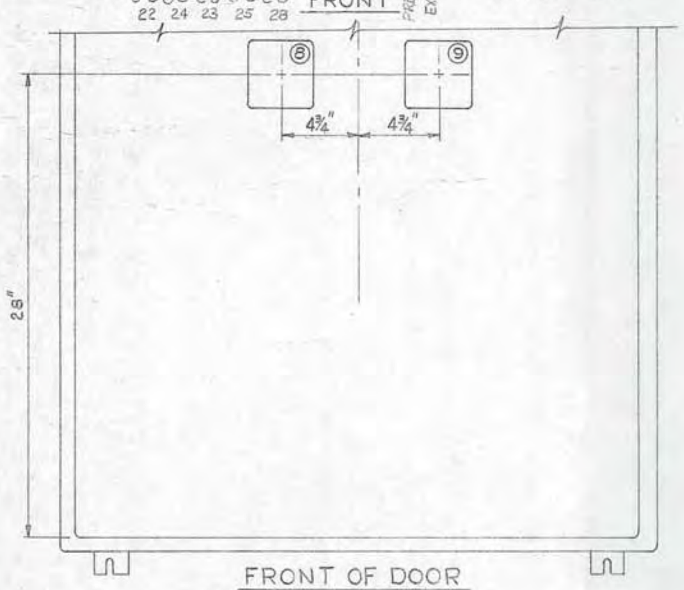
FILTER SUBPANEL #3 LAYOUT & CONNECTION [illegible]

DRAWN BY [illegible] SCALE [illegible] MATERIAL

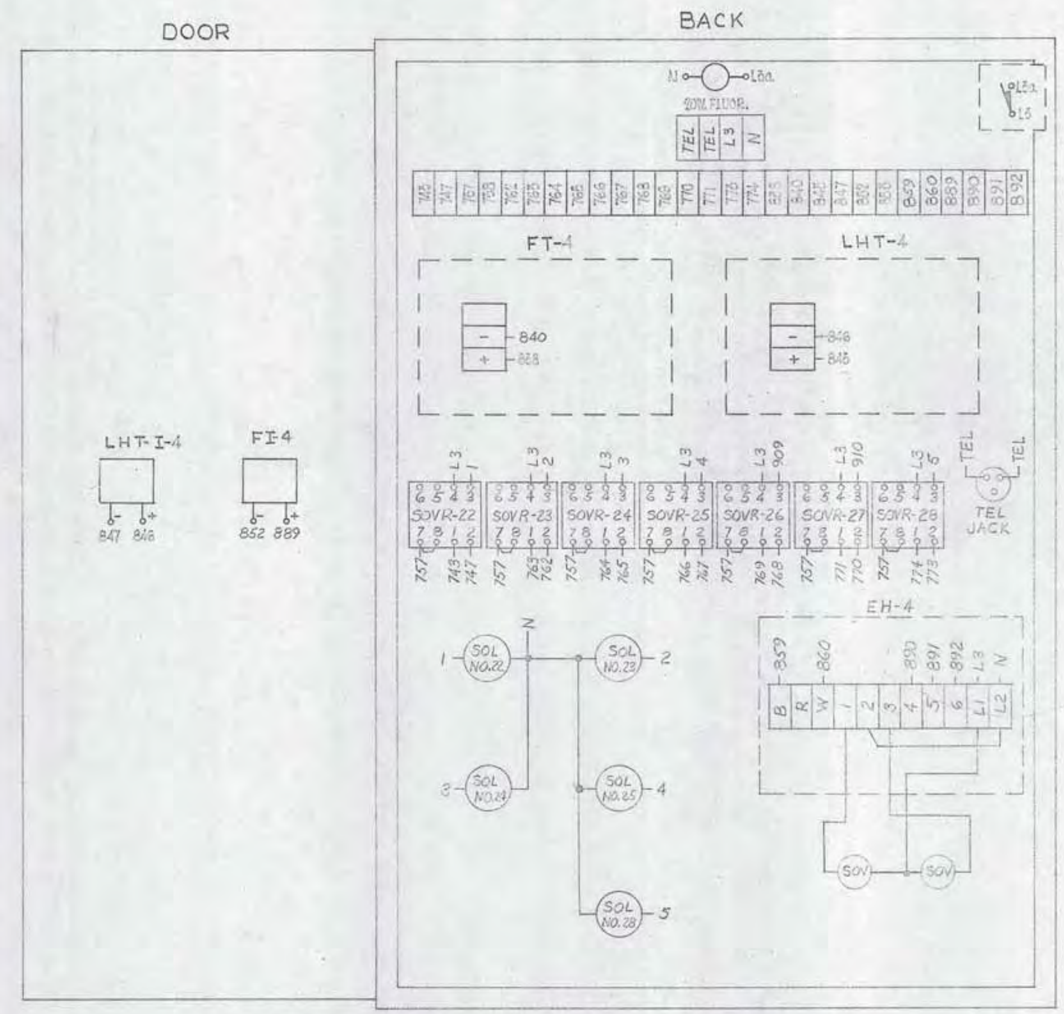
CHK'D DATE DRAWING NO.

TRACED APP'D





BULKHEAD LEGEND
22- INFLUENT
23- DRAIN
24- ISOLATION LEFT
25- ISOLATION RIGHT
28- BACKWASH



CONNECTION DIAGRAM

EQUIPMENT LEGEND

1. HOFFMAN #A-483616-NEMA-12 ENCLOSURE.
2. STRIP LIGHT-SUPER STRIP ELECTROLIER #K201-24 20W W/LAMP.
3. TERMINAL STRIP, 300V. ALLEN-BRADLEY #1492-F3.
4. FT-4 FILTER EFFLUENT FLOW XTMR
5. LHT-4 FILTER LOSS OF HEAD XTMR
6. EH-4 FILTER ELECTRIC-HYDRAULIC POSITIONER
7. SOV-22,23,24,25,28 BUTTERFLY VALVE OPEN-CLOSE SOLENOID.
8. FT-I-4 FILTER EFFLUENT FLOW INDICATOR
9. LHT-I-4 FILTER LOSS OF HEAD INDICATOR
10. SNAP SWITCH ROBERTSHAW #BRD2-1P-1S.
11. TELEPHONE JACK, CANNON #XLR-3-14N (MATES W/PLUG #XLR-3-11C.
12. SOVR-22,23,24,25,26,27,28 LINE ELECTRIC RLP RELAY.

DRAWING NOTES:

1. TIE ALL LIKE WIRE NUMBERS COMMON.
2. DRILL THREE ¼" HOLES IN BOTTOM OF BOX FOR DRAIN PURPOSES.
3. DRILL & TAP FOR ⅜" BULK HEAD FITTING.

10052 Sh 4 of 4

REVISIONS		
NO.	DATE	BY
1	8-1-68	RCD
2	2-26-69	DLZ
3	3-4-69	DLZ
4	3-26-69	DLZ

ARC SUPPRESSOR

FT-7
GREEN 603
WHITE 604 L2
BLACK 605

CHLORINATOR & AMMONIATOR CONTROL

FUSE #8
L2
N

628 BLUE
629 RED
GREEN
BLACK
WHITE
FIR-7

108 L1
L2
614
615

CYCL-FLEX PULSE COUNTER
L1 108
N
616
607

CYCL-FLEX HP-51
L1
N
617

607
AC
A13
ALARM ANNUNCIATOR
TCF

R-44
N
618 R CAR
619 W L1
620 R PRE-LI
621 W L1
622 W
623 POST LIME FEEDER (SAME AS PRE-LIME FEEDE
624 R
625 W FLUORIDE FEEDER (SAME AS PRE-LIME FEEDE
626 ALUM FEEDER (SEE BELOW)
540 538
627 ALUM FEEDER (SEE BELOW)
546 544
RFP
FEEDER PACING RELAY
REMOVED, TERMINALS JUMPERED

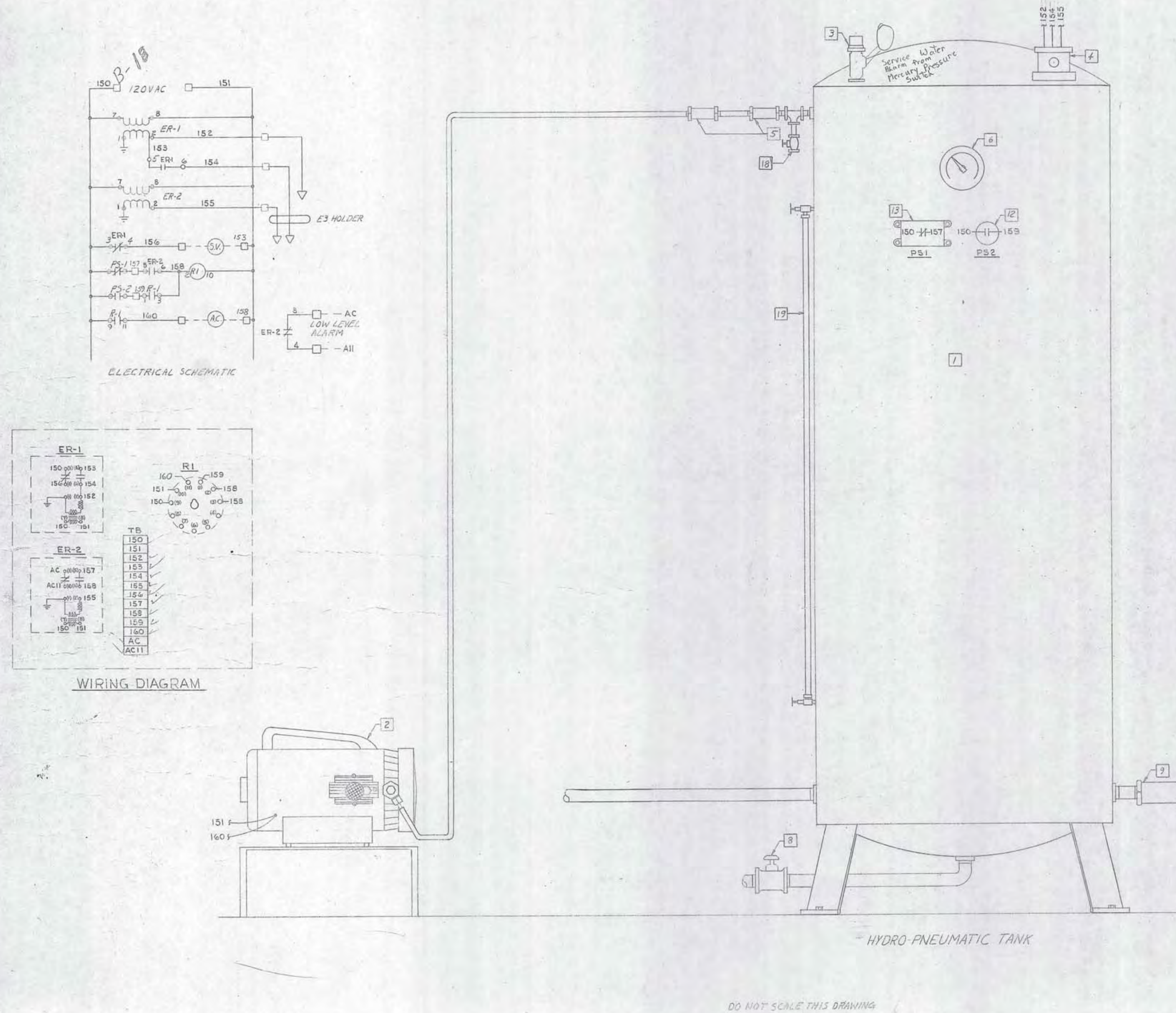
L1
1AMP
2 RP 7 (603) 603 604
N
108
RP 614 CLUTCH
RP 615 COUNTER
108
616
CLUTCH
108
617 RFP

618 RFP 619
620 RFP 621
622 RFP 623
624 RFP 625
626 RFP 540 538
627 RFP 546 544

SCHEMATIC

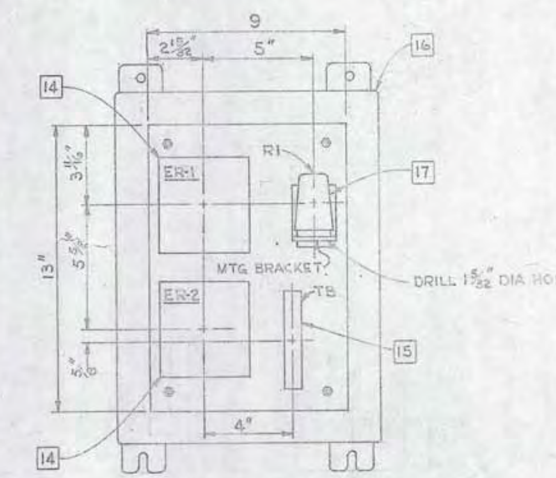
ALUM FEEDER NO. 2
SCR CONTROLLER
TB-2 6 5 4 3 2 1
TB-4 A B C D E F
TB-1 A B C D E F G H J
TB-3 A B C D E F
DUST COLLECTOR CB
L1
MIXER
ALUM FEEDER NO. 2
N
SEPERATE CONDUIT
541
542
543
544
OFF ON
546 627
RFP
SCR-2 MCP
2 3 4 5
A2 A1
MOTOR

ALUM F
SCR
TB-2 6 5 4 3 2 1
TB-1 A B C D E F
DUST COLLECTOR CB
L1
MIXER
ALUM FEEDER NO.1
N
SEPERATE CONDUIT
535
536
537
538
OFF ON
540 626
RFP
SCR-1 MCP



BILL OF MATERIAL

ITEM NO.	NAME
1	24" DIA. X 60" HIGH - 200 PSI TANK & BASE
2	BELL & GOSSETT #SY-12 AIR COMP. WITH ¼ HP 115/60 MOTOR
3	REPUBLIC 6378-3-½-2 BRASS RELIEF VALVE
4	#E3 ELECTRODE HOUSING
5	REPUBLIC NO. 483-⅜ BI-2 BRASS CHECK VALVE ⅜" NPT
6 7	MARSH ICP GUAGE 3 ½" FACE 0 TO 100 PSI, ¼" CONNECTION
8	CRANE NO. 410 GATE VALVE 1"
9 10	REPUBLIC 483-1BI-2 BRASS CHECK VALVE 1" NPT
11	SKINNER NO. LP1DB615D, 115/60 2WAY NO. SOLENOID VALVE
12	DUAL SNAP NO. 610 GB PRESSURE SWITCH
13	DUAL SNAP NO. 604 G9N PRESSURE SWITCH
14	WARRICK TYPE "I" LIQUID LEVEL CONTROLLER
15	ALLEN BRADLEY 300V. #1492-F3 TERMINAL STRIP
16	HOFFMAN #A-161206 ENCLOSURE NEMA-12
17	AMPHENOL SOCKET #77MIP-11, 11 PIN TUBE RELAY LINE ELECT.
	#MKH3A-115V.AC. COIL 3PDT CONTACTS-PLUG IN BASE.
	POLYSTYRENE COVER
18	CRANE NO. 410 GATE VALVE ⅜"
19	CRANE LIQUID LEVEL GUAGE ½" SIZE WITH 40" CENTERS



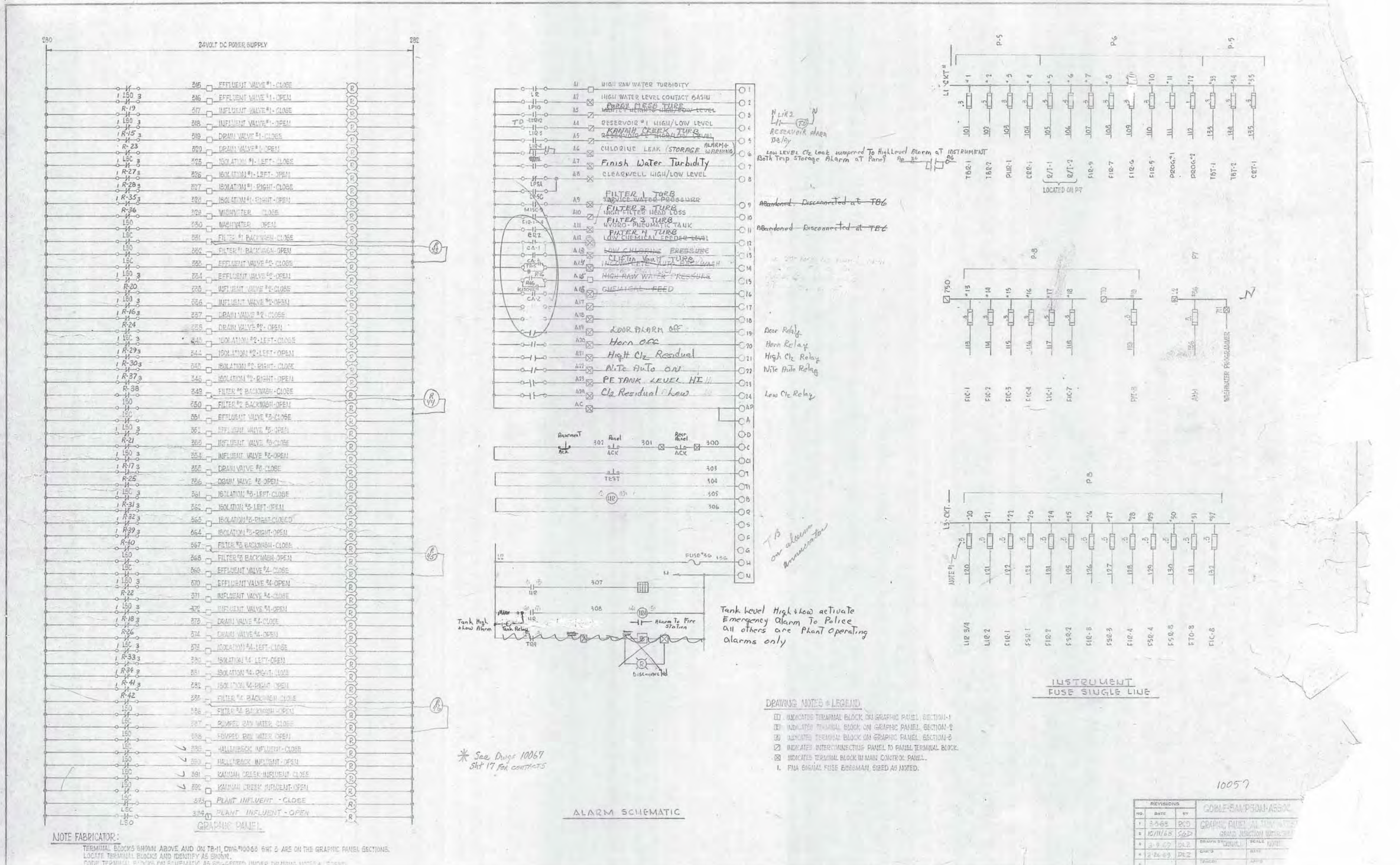
PANEL LAYOUT

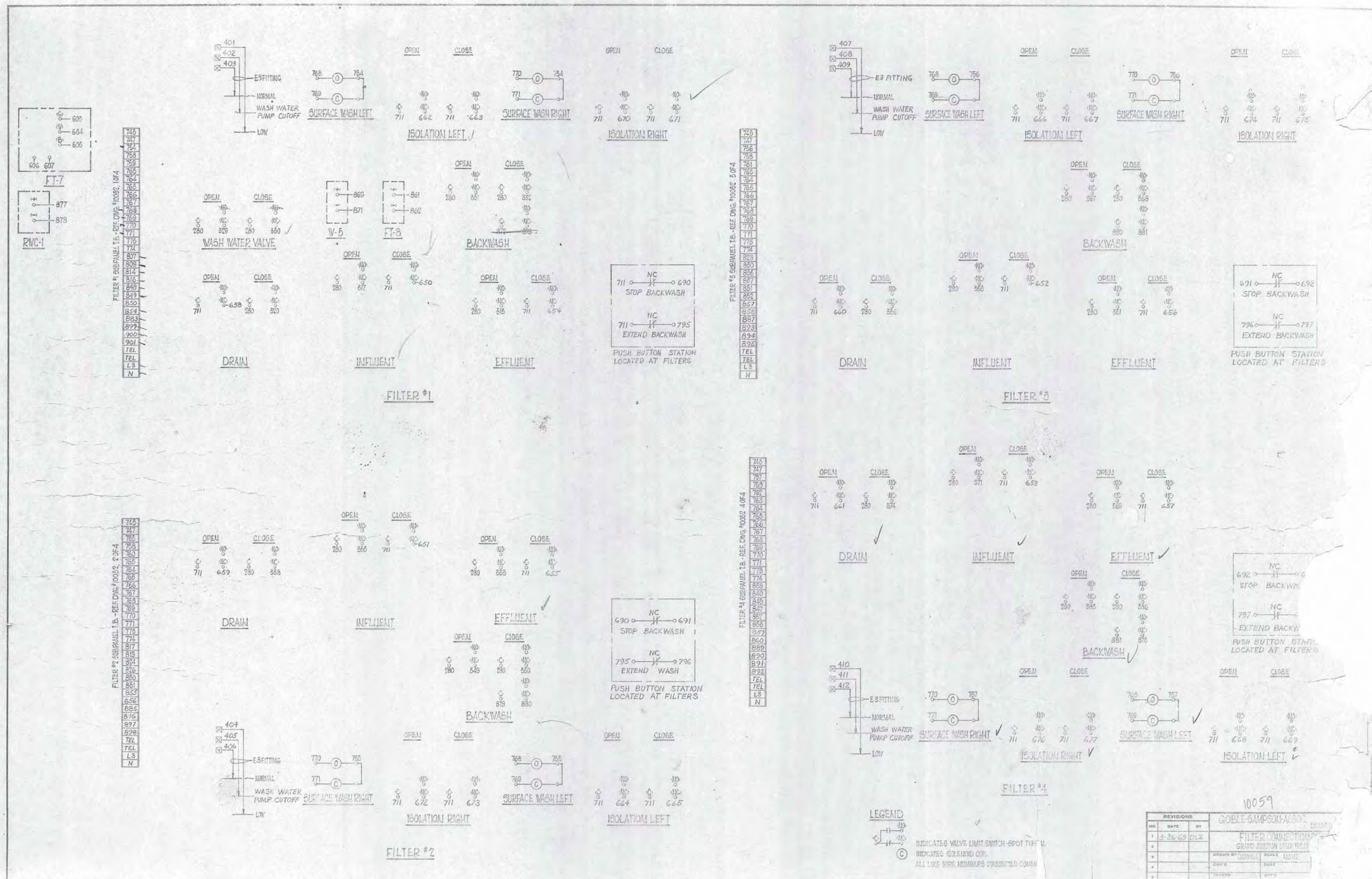
Hydropneumatic System abandone
1988

10054

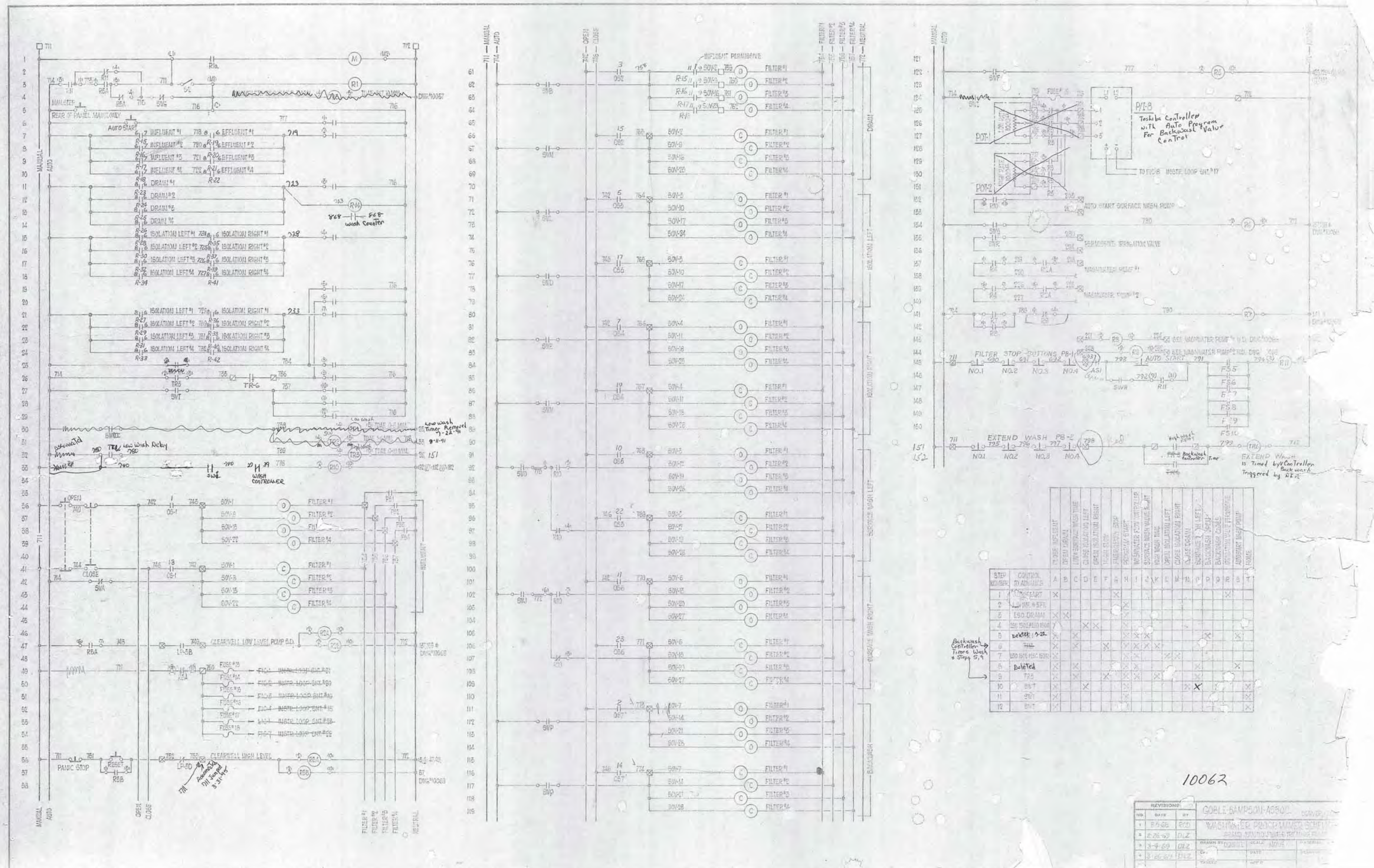
REVISIONS			
NO.	DATE	BY	
1	7-30-68	RCD	
2	10/22/68	S&D	
3			
4			
5			

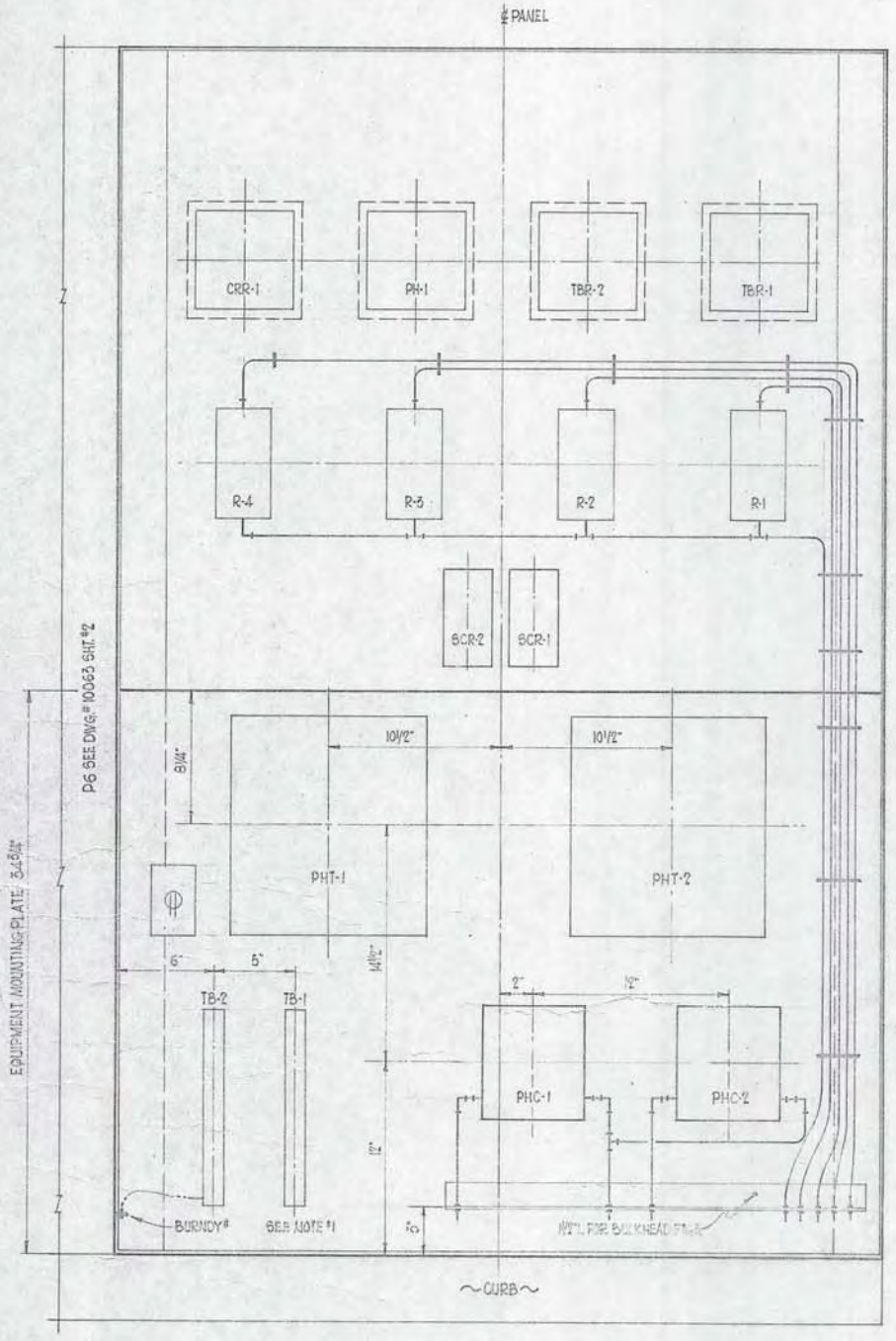
GOBLE, SAMPSON, ASS
DENVER, COLO.
GRAND JUNCTION WTR
HYDRO-PNEUMATIC TANK
DRAWN BY S&D
SCALE
CHK'D
DATE
TRACED


24VOLT DC POWER SUPPLY
EFFLUENT VALVE #1 - CLOSE
EFFLUENT VALVE #1 - OPEN
INFLUENT VALVE #1 - CLOSE
INFLUENT VALVE #1 - OPEN
DRAIN VALVE #1 - CLOSE
DRAIN VALVE #1 - OPEN
ISOLATION #1 - LEFT - CLOSE
ISOLATION #1 - LEFT - OPEN
ISOLATION #1 - RIGHT - CLOSE
ISOLATION #1 - RIGHT - OPEN
WASHWATER - CLOSE
WASHWATER - OPEN
FILTER #1 BACKWASH - CLOSE
FILTER #1 BACKWASH - OPEN
EFFLUENT VALVE #2 - CLOSE
EFFLUENT VALVE #2 - OPEN
INFLUENT VALVE #2 - CLOSE
INFLUENT VALVE #2 - OPEN
DRAIN VALVE #2 - CLOSE
DRAIN VALVE #2 - OPEN
ISOLATION #2 - LEFT - CLOSE
ISOLATION #2 - LEFT - OPEN
ISOLATION #2 - RIGHT - CLOSE
ISOLATION #2 - RIGHT - OPEN
FILTER #2 BACKWASH - CLOSE
FILTER #2 BACKWASH - OPEN
EFFLUENT VALVE #3 - CLOSE
EFFLUENT VALVE #3 - OPEN
INFLUENT VALVE #3 - CLOSE
INFLUENT VALVE #3 - OPEN
DRAIN VALVE #3 - CLOSE
DRAIN VALVE #3 - OPEN
ISOLATION #3 - LEFT - CLOSE
ISOLATION #3 - LEFT - OPEN
ISOLATION #3 - RIGHT - CLOSED
ISOLATION #3 - RIGHT - OPEN
FILTER #3 BACKWASH - CLOSE
FILTER #3 BACKWASH - OPEN
EFFLUENT VALVE #4 - CLOSE
EFFLUENT VALVE #4 - OPEN
INFLUENT VALVE #4 - CLOSE
INFLUENT VALVE #4 - OPEN
DRAIN VALVE #4 - CLOSE
DRAIN VALVE #4 - OPEN
ISOLATION #4 - LEFT - CLOSE
ISOLATION #4 - LEFT - OPEN
ISOLATION #4 - RIGHT - CLOSE
ISOLATION #4 - RIGHT - OPEN
FILTER #4 BACKWASH - CLOSE
FILTER #4 BACKWASH - OPEN
PUMPED RAW WATER - CLOSE
PUMPED RAW WATER - OPEN
HALLENBECK INFLUENT - CLOSE
HALLENBECK INFLUENT - OPEN
KANNAH CREEK INFLUENT - CLOSE
KANNAH CREEK INFLUENT - OPEN
PLANT INFLUENT - CLOSE
PLANT INFLUENT - OPEN
GRAPHIC PANEL
NOTE FABRICATOR:
TERMINAL BLOCKS SHOWN ABOVE AND ON TB-11, DWG #10068 SHT 5 ARE ON THE GRAPHIC PANEL SECTIONS.
LOCATE TERMINAL BLOCKS AND IDENTIFY AS SHOWN.
CODE TERMINAL BLOCKS ON SCHEMATIC AS SUGGESTED UNDER DRAWING NOTES & LEGEND.
HIGH RAW WATER TURBIDITY
HIGH WATER LEVEL CONTACT BASIN
RESERVOIR #1 HIGH/LOW LEVEL
KANNAH CREEK TURB
CHLORINE LEAK (STORAGE
ALARM + WARNING
Finish Water Turbidity
CLEARWELL HIGH/LOW LEVEL
FILTER 1 TURB
FILTER 2 TURB
FILTER 3 TURB
FILTER 4 TURB
Clifton Vault TURB
DOOR ALARM OFF
Horn Off
High Cl2 Residual
Nite Auto ON
PE TANK LEVEL HI
Cl2 Residual Low
Reservoir alarm Delay
Low LEVEL Cl2 Leak jumpered To High Level Alarm at INSTRUMENT
Both Trip Storage Alarm at Panel
Abandoned Disconnected at TB6
Door Relay
Horn Relay
High Cl2 Relay
Nite Auto Relay
Low Cl2 Relay
Basement
Panel
Door Panel
ACK
TEST
FUSE #50
Tank High & Low Alarm
Tank Relay
Alarm To Fire Station
Disconnected
Tank Level High & Low activate Emergency alarm To Police
All others are Plant Operating alarms only
TB on alarm annunciator
* See Dwgs 10067 Sht 17 for contacts
ALARM SCHEMATIC
DRAWING NOTES & LEGEND
INDICATES TERMINAL BLOCK ON GRAPHIC PANEL, SECTION-1
INDICATES TERMINAL BLOCK ON GRAPHIC PANEL, SECTION-2
INDICATES TERMINAL BLOCK ON GRAPHIC PANEL, SECTION-3
INDICATES INTERCONNECTING PANEL TO PANEL TERMINAL BLOCK.
INDICATES TERMINAL BLOCK IN MAIN CONTROL PANEL.
1. FNA SIGNAL FUSE BUSSMAN, SIZED AS NOTED.
L1 CKT #
P-5
P-6
TBR-1
TBR-2
PUR-1
CRR-1
R/T-1
R/T-2
LOCATED ON P7
FIR-9
FIR-7
FIR-6
FIR-5
PROG #1
PROG #2
TBT-1
TBT-2
CBT-1
P-8
P7
FIC-1
FIC-2
FIC-5
FIC-4
LIC-1
FIC-7
PIT-8
AHH
WASHWATER PROGRAMMER
L3 CKT.
NOTE #1
LIR 3/4
LIR 2
FIC-1
FSR-1
FIR-2
FSR-2
FIR-3
FSR-3
FIR-4
FSR-4
FSR-8
FTO-8
FIC-8
INSTRUMENT FUSE SINGLE LINE
10057
REVISIONS
GOBLE-SAMPSON-ASSOC.
GRAPHIC PANEL ALARM WATER
GRAND JUNCTION
NONE

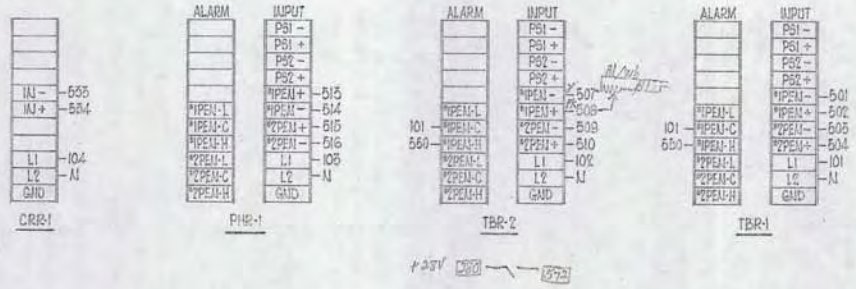


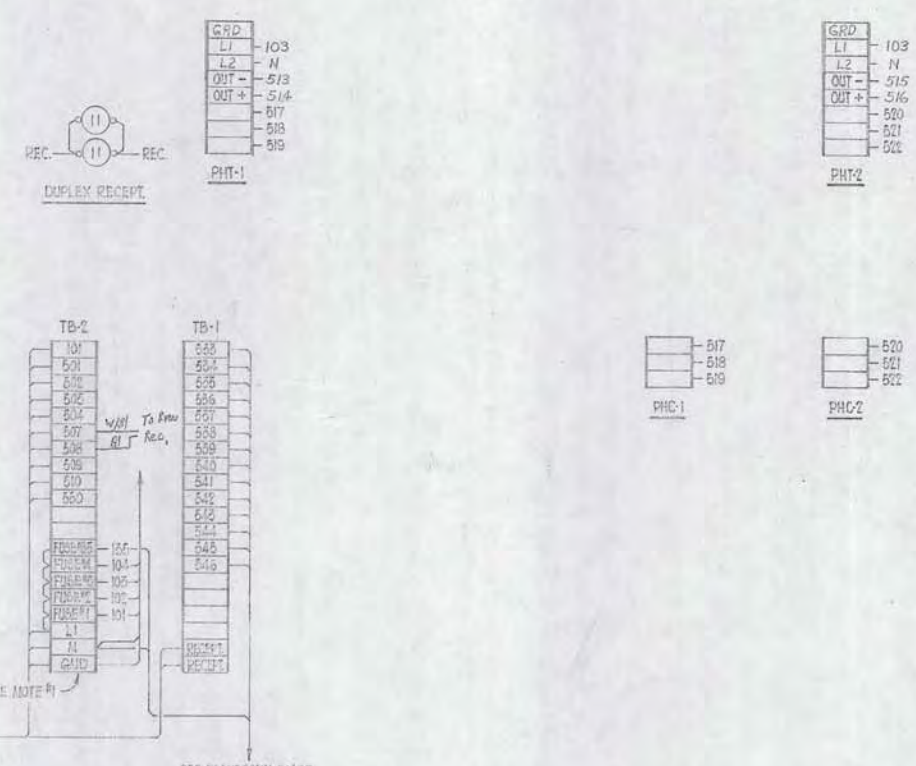
FILTER #1
FILTER #2
FILTER #3
FILTER #4
DRAIN
INFLUENT
EFFLUENT
BACKWASH
WASH WATER VALVE
SURFACE WASH LEFT
SURFACE WASH RIGHT
ISOLATION LEFT
ISOLATION RIGHT
OPEN
CLOSE
E3 FITTING
NORMAL
WASH WATER PUMP CUTOFF
LOW
STOP BACKWASH
EXTEND BACKWASH
EXTEND WASH
PUSH BUTTON STATION LOCATED AT FILTERS
FT-7
FT-8
W-5
RWC-1
FILTER #1 SUBPANEL T.B. - REF. DWG. #10062 1 OF 4
FILTER #2 SUBPANEL T.B. - REF. DWG. #10062 2 OF 4
FILTER #3 SUBPANEL T.B. - REF. DWG. #10062 3 OF 4
FILTER #4 SUBPANEL T.B. - REF. DWG. #10062 4 OF 4
LEGEND
INDICATES VALVE LIMIT SWITCH-SPDT TYPICAL
INDICATES SOLENOID COIL
ALL LIKE WIRE NUMBERS CONNECTED COMMON
REVISIONS
3-26-69 DLZ
GOBLE-SAMPSON-ASSOC.
FILTER CONNECTIONS
10059


MANUAL
AUTO
REAR OF PANEL MAN. ONLY
AUTO START
OPEN
CLOSE
PANIC STOP
RESET
CLEARWELL LOW LEVEL PUMP S.D.
CLEARWELL HIGH LEVEL
NEUTRAL
DRAIN
ISOLATION LEFT
ISOLATION RIGHT
SURFACE WASH LEFT
SURFACE WASH RIGHT
BACKWASH
Toshiba Controller with Auto Program For Backwash Valve Control
AUTO START SURFACE WASH PUMP
FILTER STOP BUTTONS PB-1
AUTO START
EXTEND WASH PB-2
EXTEND Wash is Timed by Controller Backwash Triggered by
Backwash Controller Times Wash + Steps 5, 9
10062
GOBLE SAMPSON ASSOC.



REAR VIEW P5
SCALE: 3/16"=1'





EQUIPMENT LEGEND

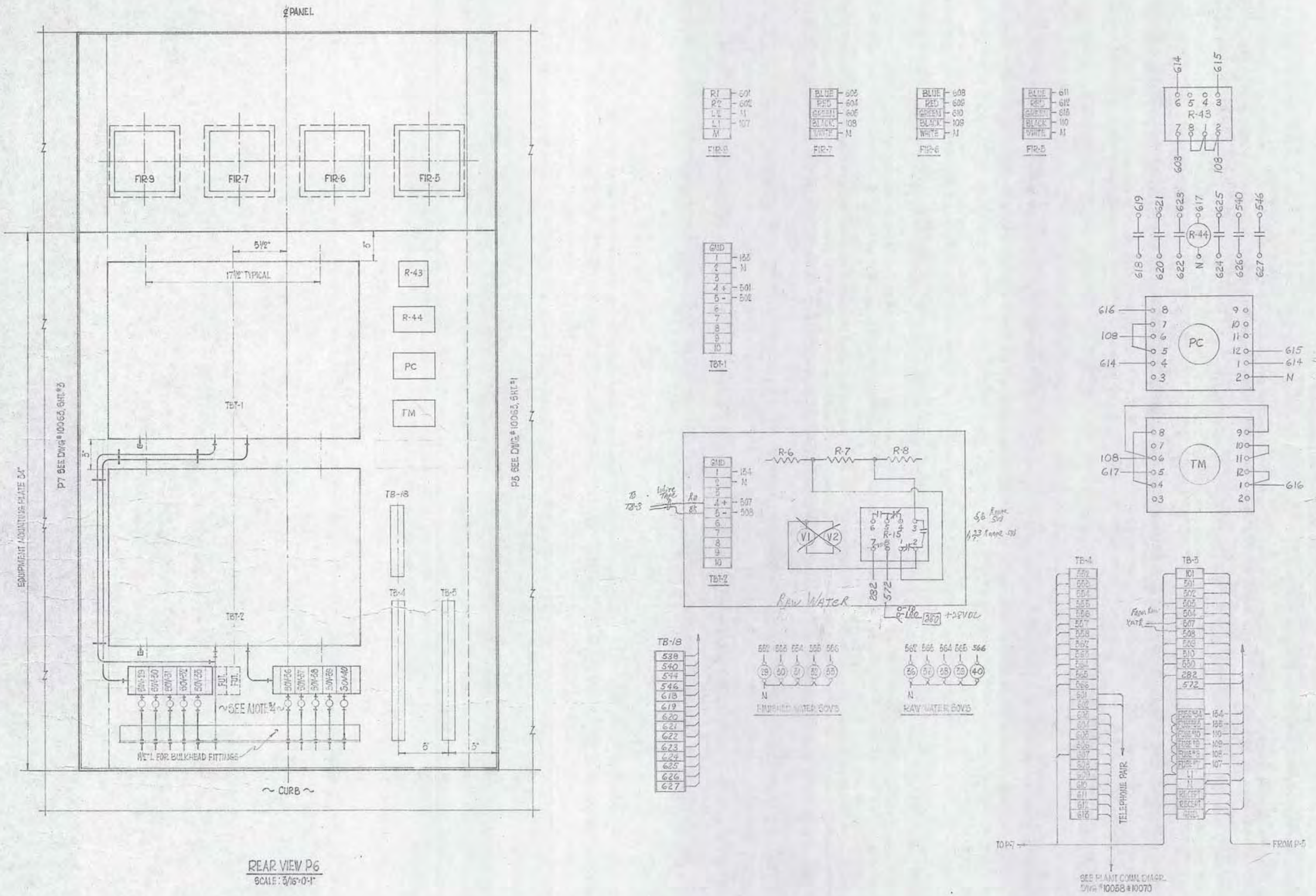
CRR-1	CHLORINE RESIDUAL RECORDER
PH-1	PH AFTER MIXING & CLEAR WELL
TBR-1	FINISHED WATER TURBIDITY RECORDER
TBR-2	RAW WATER TURBIDITY RECORDER
R1	ROTOMETER
R2	ROTOMETER
R3	ROTOMETER
R4	ROTOMETER
PHT-1	AMPLIFIER, PEAK #1
PHT-2	AMPLIFIER, PEAK #2
PHC-1	SAMPLE CHAMBER, AMPLIFIER #1
PHC-2	SAMPLE CHAMBER, AMPLIFIER #2
BCR-1	STATOTROL CONTROLLER, GE #2SBRA
BCR-2	STATOTROL CONTROLLER, GE #2SBA
TB-1 & 2	TERMINAL BLOCKS, ALLEN-BRADLEY #1492-T5
⏀	DUPLEX RECEPT. HUBBELL #5262 W/ HANDY BOX W/COVER.
—	FUSED TERMINAL BLOCK, ALLEN-BRADLEY #1492-CFB

DRAWING NOTES:

1. LOOP #4 TW GREEN FROM BURNDY GROUND CONNECTOR TO ALL INSTRUMENT GROUND BLOCKS. CONTRACTOR TO TIE MAIN GROUND LOOP TO BURNDY CONNECTOR.
2. TIE ALL LIKE WIRE NUMBERS COMMON.
3. WIRE BUNDLE TO BE WINDOWS FROM TB-2 COILED & TAPED IN THIS SECTION FOR SHIPPING.
4. RECEPTACLE CIRCUIT PROVIDED TO PANEL BY CONTRACTOR WIRE COIL TO TBS INDICATED, AND INCLUDE IN PANEL TO PANEL BUNDLE.

10063 SH 1 of 7

REVISIONS			GOBLE-GAMPRUD ASSOC. DENVER, COLO.
NO.	DATE	BY	
1	8-8-68	RCD	P5-ELEVATIONS & CONNECTION DIAGR.
2	3-27-69	DLZ	GRAND JUNCTION WATER TREATING PLANT
3			DRAWN BY DOUBELL SCALE NOTED MATERIAL
4			CH'D DATE DRAWING NO.
5			TRACED APP'D P-5



REAR VIEW P6
SCALE: 3/16"=1'-0"

EQUIPMENT LEGEND

FIR-5	KAUNAH CREEK INFLUENT RECORDER
FIR-6	HALLENBACK RESERVOIR INFLUENT RECORDER
FIR-7	MAIN INFLUENT RECORDER
FIR-9	PLANT EFFLUENT RECORDER
TBT-1	FINISHED WATER TURBIDITY TRANSMITTER
TBT-2	RAW WATER TURBIDITY TRANSMITTER
SOV'S	(AS NOTED) ASCO SOLENOID VALVE BULL #8318-61
TB-5-4	TERMINAL BLOCKS, ALLEN-BRADLEY #1492-F3
—	FUSE TERMINAL BLOCKS, ALLEN-BRADLEY #1492-CE6
R-43	POTTER & BRUMFIELD KRP-11 W/AMPHENOL 140-103 SOCKET.
R-44	GE CR120 - 6 POLE RELAY.
PC	EAGLE CYCL-FLEX PULSE COUNTER.
TM	EAGLE CYCL-FLEX HP-51 TIMER.

DRAWING NOTES:

1. LOOP #14 TW GREEN FROM TB-5 TO ALL INSTRUMENT GROUND BLOCKS.
2. TIE ALL LIKE WIRE NUMBERS COMMON.
3. WIRE BUNDLE TO BE UNDONE FROM TB-5, COILED & TAPED IN THE PANEL FOR SHIPPING.
4. STAND OFF SOLENOID VALVES & 1/2" NIPPLE WITH ALUMINUM OF 5" FROM MOUNTING PLATE. USE AREA CLEARED AS WIREWAY.

10063 Sh 2 of 7

REVISIONS		
NO.	DATE	BY
1	8-9-68	RCD
2	2-26-69	DLZ
3	3-27-69	DLZ
4		
5		

GOBLE-SAMPSON-ASSOC. DENVER, COLO.

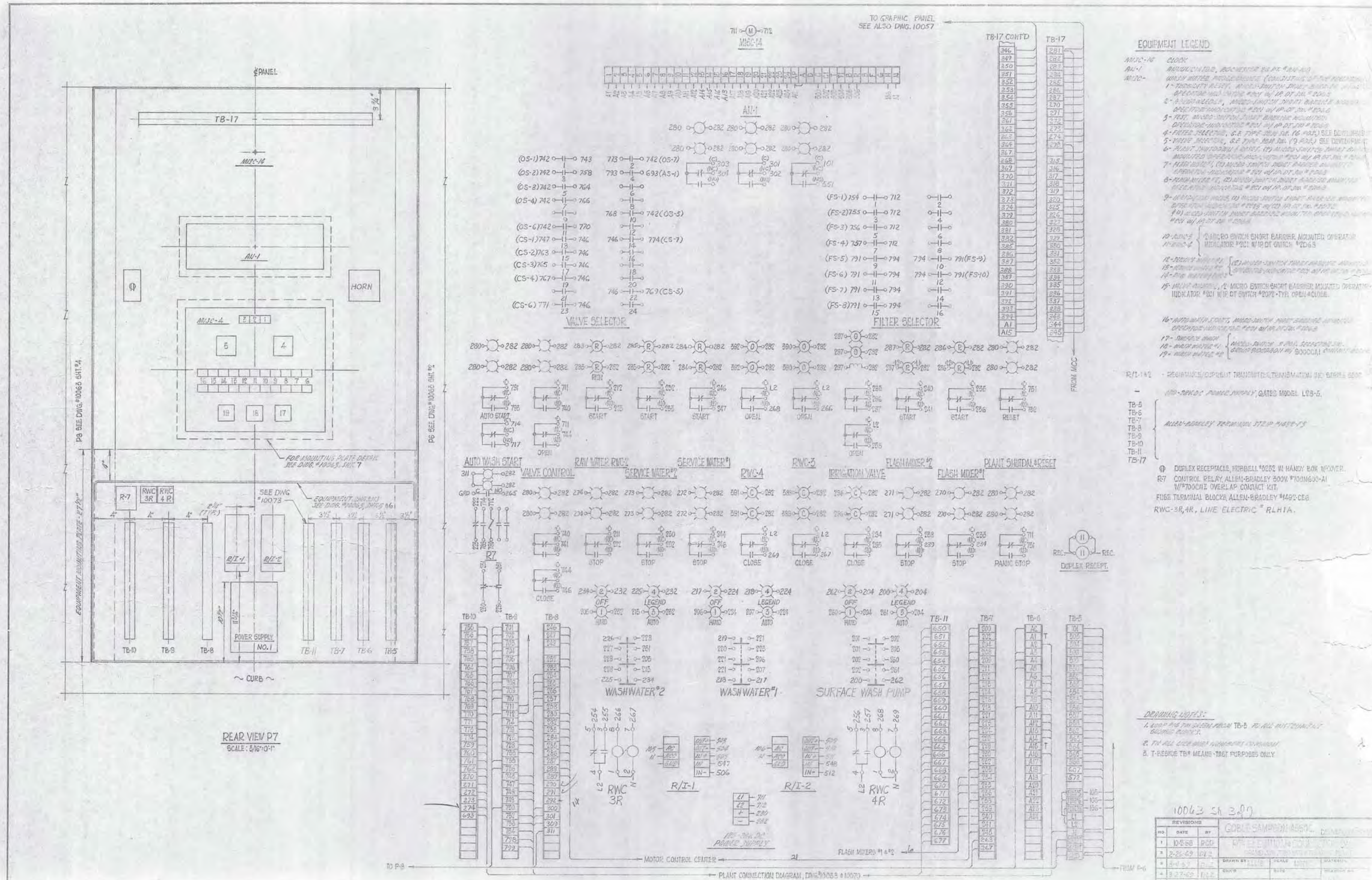
P6-ELEVATION & CONNECTION DIAGRAM

GRAND JUNCTION WATER TREATING PLANT

DRAWN BY: DONALL | SCALE: NOTED | MATERIAL:

CH'K'D | DATE | DRAWING NO. 10063

TRACED | APP'D


TO GRAPHIC PANEL
SEE ALSO DWG. 10057
MISC-14
AN-1
VALVE SELECTOR
FILTER SELECTOR
TB-17 CONT'D
TB-17
FROM MCC
EQUIPMENT LEGEND
10-MISC-4 } 5 MICRO SWITCH SHORT BARRIER MOUNTED OPERATOR INDICATOR #201 W/18 DT SWITCH #ED63
15- MICRO SWITCH SHORT BARRIER MOUNTED OPERATOR INDICATOR #201 W/18 DT SWITCH #2072-TYP. OPEN-CLOSE.
R/I-1&2
TB-5
TB-6
TB-7
TB-8
TB-9
TB-10
TB-11
TB-17
Φ DUPLEX RECEPTACLE, HUBBELL #5252 W/ HANDY BOX W/COVER.
R7 CONTROL RELAY, ALLEN-BRADLEY 600V. #700N600-A1 W/#700CH2 OVERLAP CONTACT KIT.
FUSE TERMINAL BLOCKS, ALLEN-BRADLEY #1492-CE6
RWC-3R,4R, LINE ELECTRIC "RLHTA.
AUTO WASH START
VALVE CONTROL
RAW WATER RWC-2
SERVICE WATER #2
SERVICE WATER #1
RWC-4
RWC-3
IRRIGATION VALVE
FLASH MIXER #2
FLASH MIXER #1
PLANT SHUTDN. & RESET
AUTO START
START
OPEN
STOP
CLOSE
RESET
PANIC STOP
DUPLEX RECEPT.
OFF
HAND
LEGEND
AUTO
WASHWATER #2
WASHWATER #1
SURFACE WASH PUMP
RWC 3R
RWC 4R
R/I-1
R/I-2
POWER SUPPLY
MOTOR CONTROL CENTER
FLASH MIXERS #1 & #2
PLANT CONNECTION DIAGRAM, DWG. #10065 & 10070
TO P-8
FROM P-6
TB-11
TB-7
TB-6
TB-5
DRAWING NOTES:
3. T-BESIDE TB# MEANS-TEST PURPOSES ONLY.
10063 Sh 3 of 9
REVISIONS
GOBLE SAMPSON ASSOC.
DRAWN BY
SCALE
¢ PANEL
TB-17
MISC-14
AN-1
HORN
MISC-4
SEE DWG #10073
R-7
RWC 3R
RWC 4R
R/I-1
R/I-2
POWER SUPPLY NO. 1
TB-10
TB-9
TB-8
TB-11
TB-7
TB-6
TB-5
~ CURB ~
FOR MOUNTING PLATE DETAIL SEE DWG. #10065, SHT. 7
P8 SEE DWG. #10066 SHT. #4
P6 SEE DWG. #10066 SHT. #2
EQUIPMENT MOUNTING PLATE
REAR VIEW P7
SCALE: 5/16"=1'-0"

REAR VIEW P8
SCALE: 3/16"=1'-0"

EQUIPMENT LEGEND

LIR-2	MANTEY HEIGHTS LEVEL RECORDER
LIR-3&4	RESERVOIR #1 & #2 PEN RECORDER
FIR-1	FILTER #1 EFFLUENT & LOSS OF HEAD RECORDER
FIR-2	FILTER #2 EFFLUENT & LOSS OF HEAD RECORDER
FIR-3	FILTER #3 EFFLUENT & LOSS OF HEAD RECORDER
FIR-4	FILTER #4 EFFLUENT & LOSS OF HEAD RECORDER
LIC-1	CONTACT BASIN INDICATING CONTROLLER
FIC-1	FILTER #1 EFFLUENT CONTROLLER
FIC-2	FILTER #2 EFFLUENT CONTROLLER
FIC-3	FILTER #3 EFFLUENT CONTROLLER
FIC-4	FILTER #4 EFFLUENT CONTROLLER
~~FIC-8~~	~~BACK WASH CONTROLLER~~
FSR-1	FILTER #1-FLOW SQUARE ROOT EXTRACTOR
FSR-2	FILTER #2-FLOW SQUARE ROOT EXTRACTOR
FSR-3	FILTER #3-FLOW SQUARE ROOT EXTRACTOR
FSR-4	FILTER #4-FLOW SQUARE ROOT EXTRACTOR
FSR-8	BACK WASH-FLOW SQUARE ROOT EXTRACTOR
MISC-5	WASH WATER RATE SETTER & EXTENSION TIMER
FIC-7	CONTACT BASIN FLOW RECORDER
FTO-8	WASHWATER TOTALIZER
P/I-8	POT/CURRENT TRANSMITTER, TRANSMATION INC. SERIES 55-4T
TB-	TERMINAL BLOCKS, ALLEN-BRADLEY #1492-F6
ф	DUPLEX RECEPTACLE, HUBBELL #5257 IN HANDY BOX W/COVER.

FUSE TERMINAL BLOCK, ALLEN-BRADLEY #1492-CE6

POWER SUPPLY 2, 3, BRISTOL 9J1.

DRAWING NOTES:

1. LOOP #14 TW GREEN FROM TB-12 TO ALL INSTRUMENT GROUND BLOCKS
2. TIE ALL LIKE WIRE NUMBERS COMMON.
3. RUN ALL INSTRUMENTATION SEPARATE FROM POWER.

10063 Sh 4 of 7

REVISIONS		
NO.	DATE	BY
1	9-18-68	RCD
2	2-26-69	DLZ
3	3-26-69	DLZ
4		
5		

GOBLE-SAMPSON ASSOC. DENVER, COLO.

P8-ELEVATION & CONNECTION DIAG.

GRAND JUNCTION WATER TREATING PLANT

DRAWN BY DUNHILL

SCALE NOTED

MATERIAL

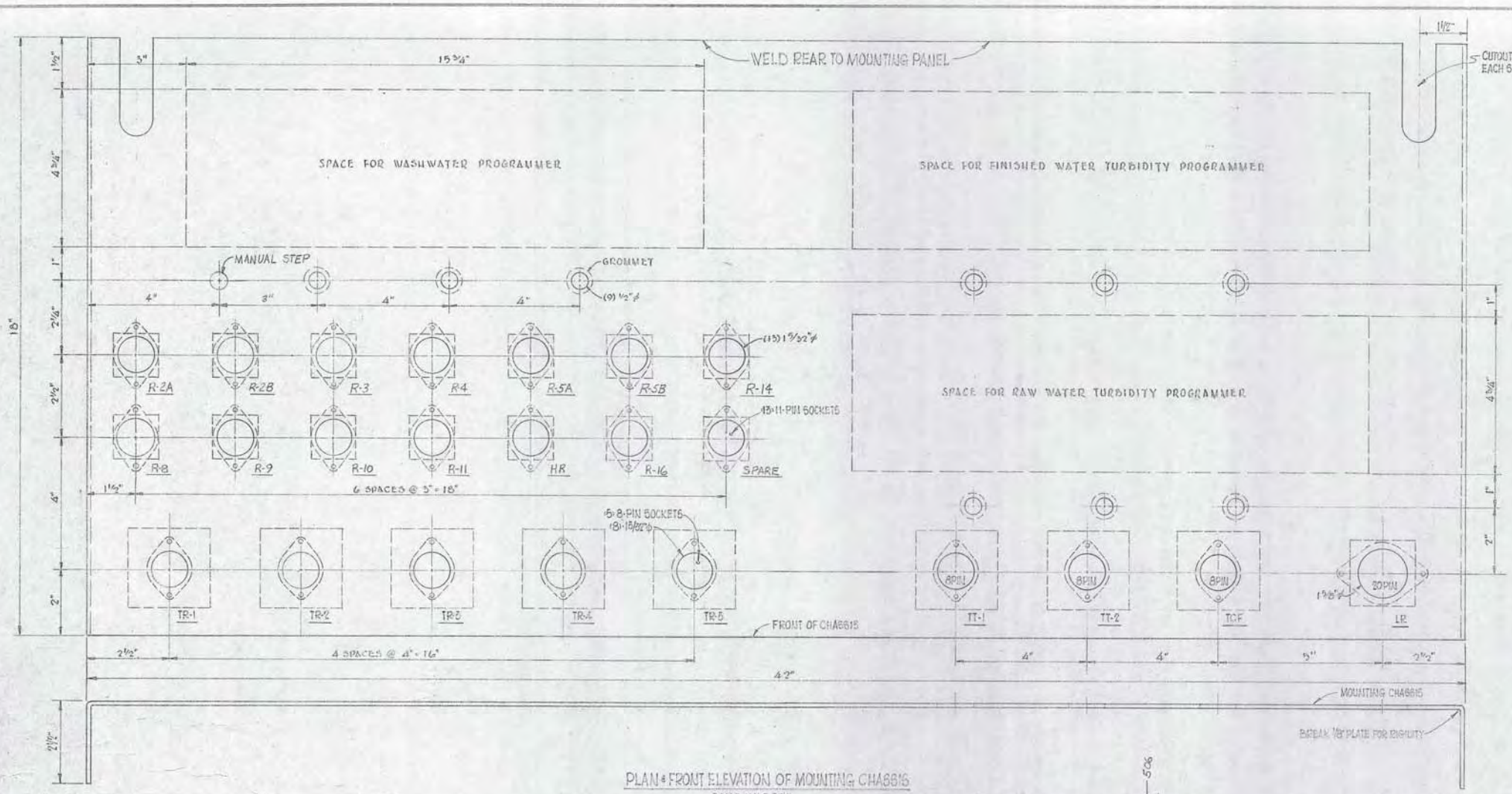
CHK'D

DATE

DRAWING NO.

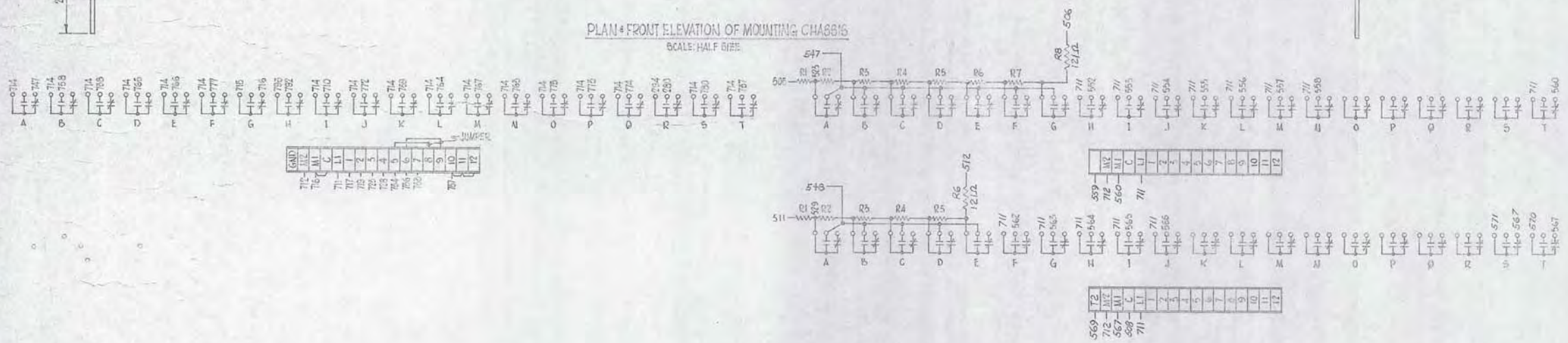
TRACED

APP'D



PLAN & FRONT ELEVATION OF MOUNTING CHASSIS

SCALE: HALF SIZE



TOP VIEW OF MOUNTING CHASSIS

EQUIPMENT LEGEND

1. TURBIDITY PROGRAMMER, AGASTAT ® 2282 AA20B - (1) REQ'D. & WASHWATER PROGRAMMER, AGASTAT ® 2282AB20B - (2) REQ'D. & 4000 PROGRAMMER PINS EACH.
2. TT-1, TT-2, TIME DELAY RELAY, 120V AC COIL, OCTAL BASE, PLUG IN, AGASTAT ® 2412-AA - (2) REQ'D.
3. TR-1, 2, 3, 4, 5, TIME DELAY RELAYS, 120V AC COIL, OCTAL BASE, PLUG IN, AGASTAT ® 2412-AF - (5) REQ'D.
4. TCF - TIME DELAY RELAY 120V AC COIL, OCTAL BASE, PLUG IN, AGASTAT ® 2412-AF - (1) REQ'D.
5. LR - LATCH RELAY, 115 AC COIL, 8POT CONTACTS, PLUG IN BASE, POLYSTYRENE COVER, LINE ELECTRIC ® RLN16A - (1) REQ'D.
6. BALANCE OF CONTROL RELAYS EXCEPT R7 ARE 115VAC COIL - 8POT CONTACTS PLUG IN BASE, POLYSTYRENE COVER, LINE ELECTRIC ® MKN8A - (16) REQ'D.
7. AMPHENOL SOCKETS ® 77-MIP-20, 20 PIN TUBE - (1) REQ'D.
8. AMPHENOL SOCKETS ® 77-MIP-11, 11 PIN TUBE - (5) REQ'D.
9. AMPHENOL SOCKETS ® 77-MIP-8, 8 PIN TUBE - (5) REQ'D.
10. MANUAL STEP P.B., ALLEN-BRADLEY ® 800T-ATA

NOTES:

1. WORK THIS DWG. W/10065, SHT. #5 & SHT. #6
2. ALL WIRE BUNDLING TO BE DONE ON BOTTOM SIDE OF MTG. CHASSIS. WIRES FOR PROGRAMMERS FEED THRU 1/2" HOLES DRILLED IN CHASSIS.
3. WIRE ALL LIKE NUMBERS COMMON.

10062 SH 5 REV

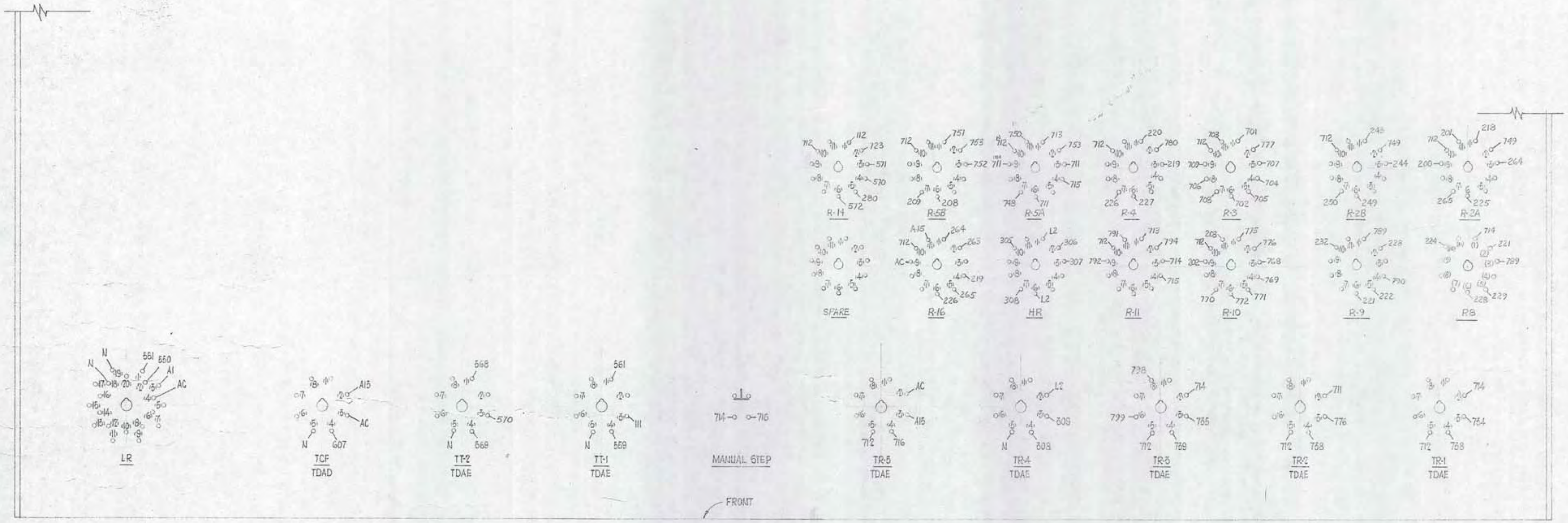
REVISIONS			
NO.	DATE	BY	
1	10-2-68	RGD	
2	11-26-68	DLZ	
3	3-27-69	DLZ	
4			
5			

GOBLE & SIMPSON-ASSOC. DENVER, COLO.

MOUNTING CHASSIS LAYOUT & COMPONENTS

GRAND JUNCTION WATER TREATMENT PLANT

DRAWN BY	SCALE	MATERIAL
CHK'D	DATE	DRAWING NO.
TRACED	APP'D	



BOTTOM VIEW OF MOUNTING CHASSIS

NOTES:

1. WORK THIS DRAWING W/10068, SHT. #5
2. WIRE ALL LIKE NUMBERS COMMON.

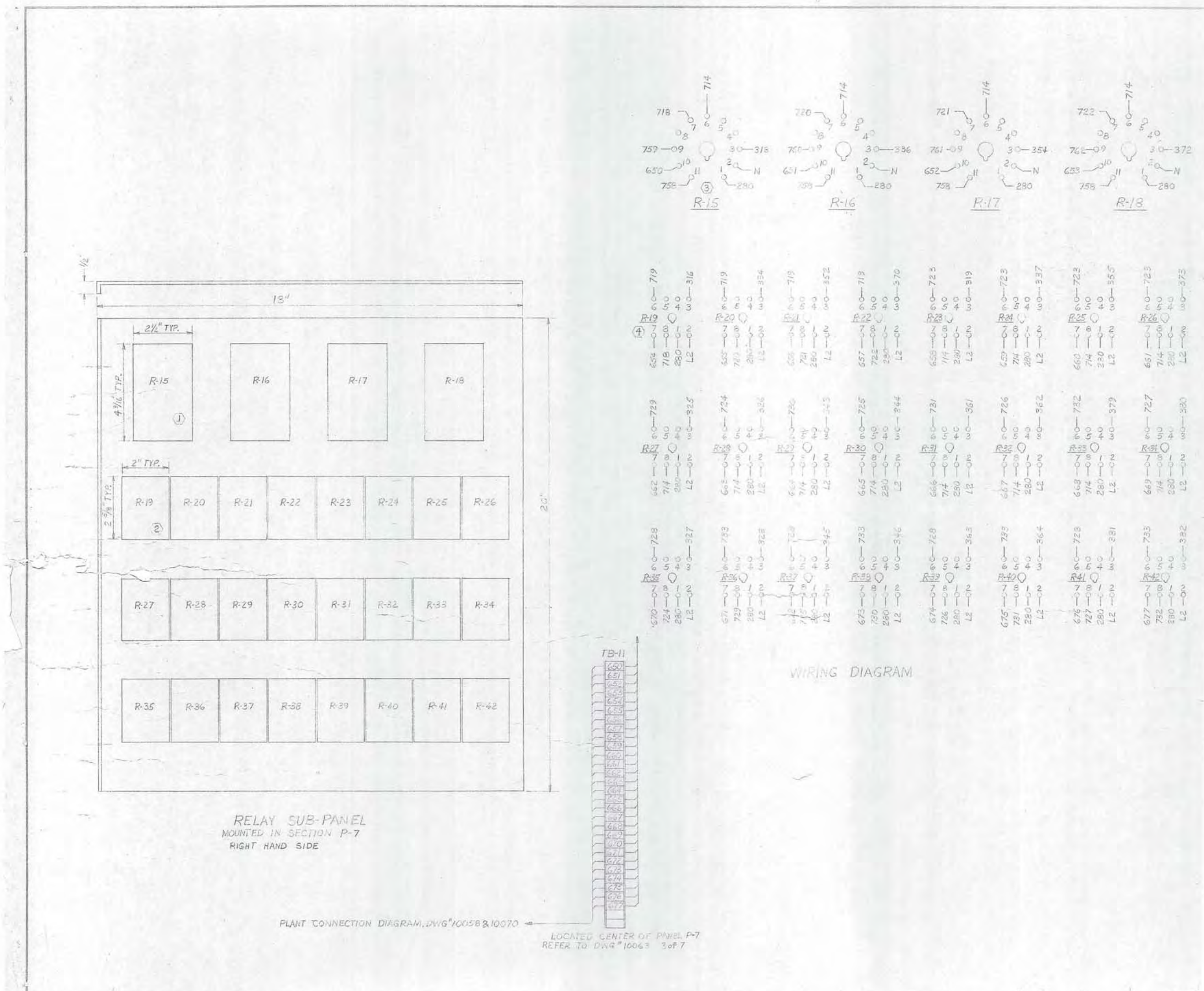
10067 Sh 6 of 7

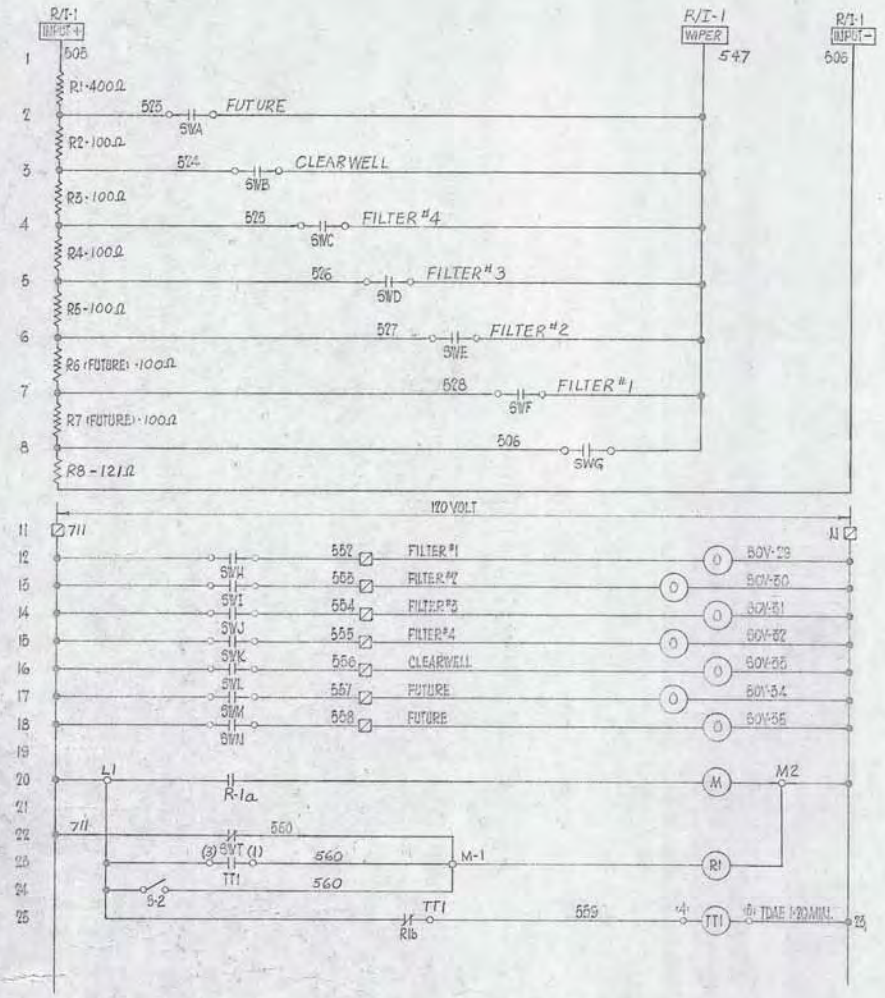
REVISIONS		
NO.	DATE	BY
1	2-26-69	DLZ
2	3-27-69	DLZ
3		
4		
5		

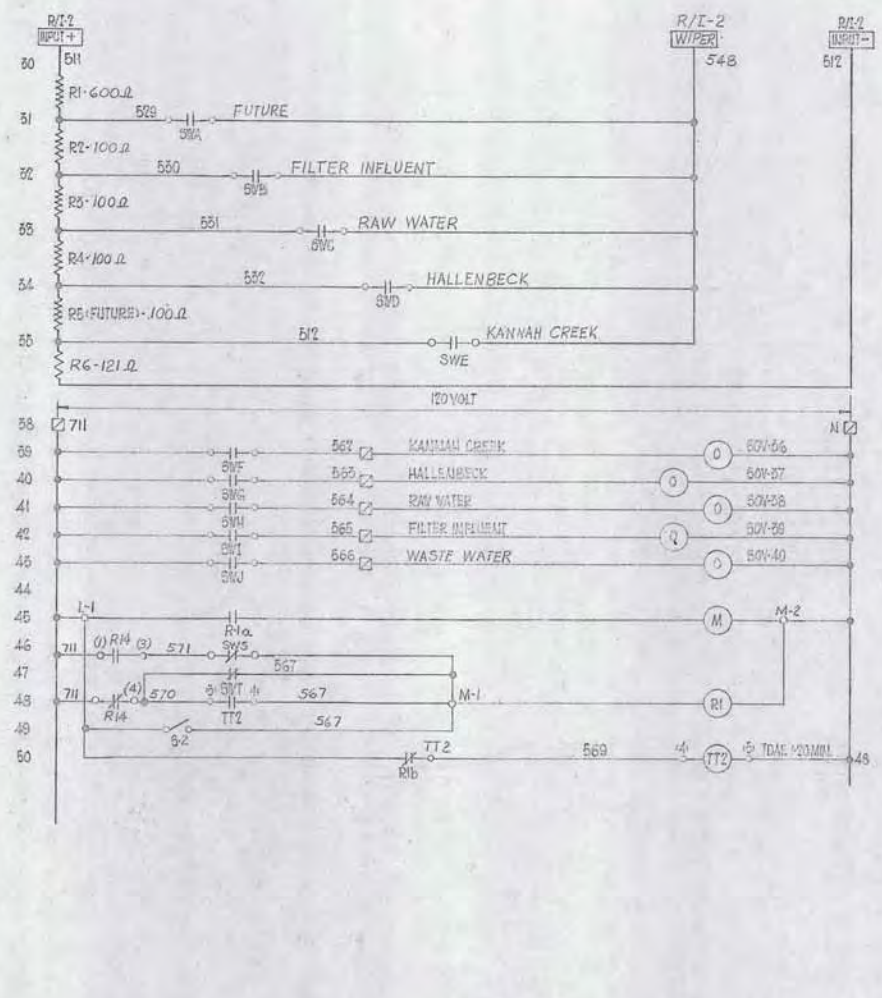
GOBLE-SAMPSON-ASSOC. DENVER, COLORADO

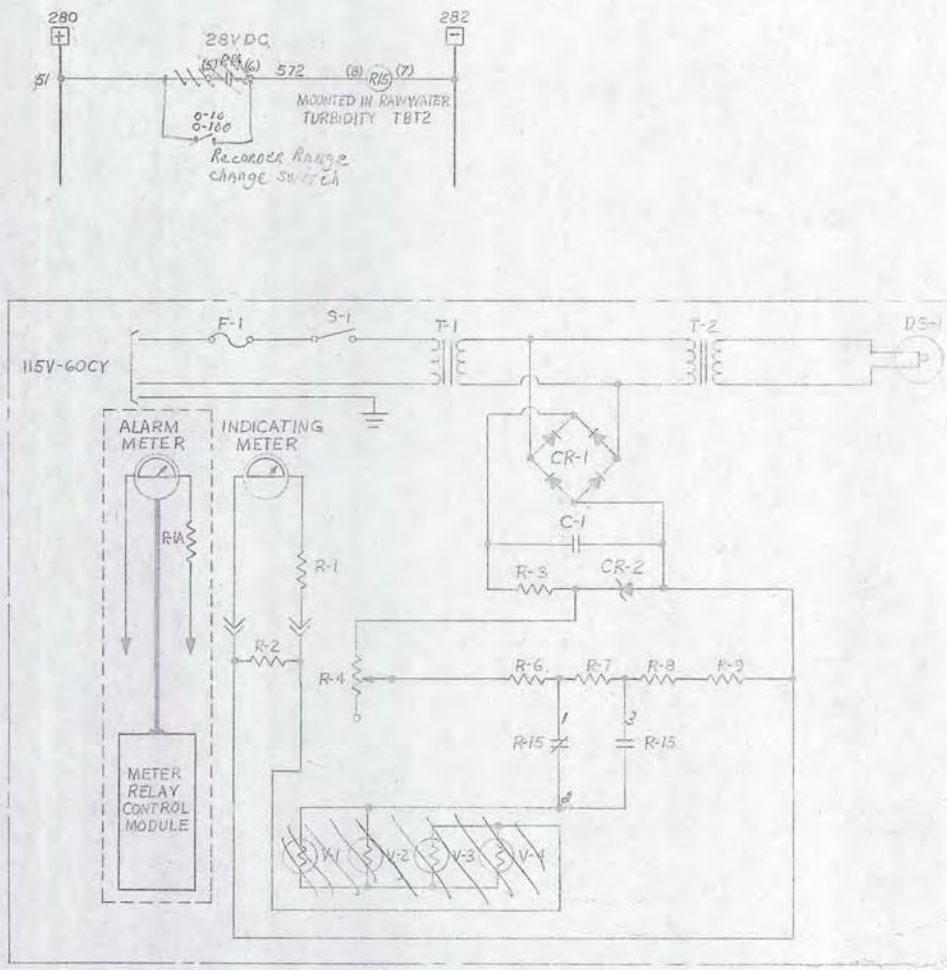
MOUNTING CHASSIS LAYOUT & CONN. DIAGRAMS
GRAND JUNCTION WATER TREATING PLANT

DRAWN BY DUNHILL	SCALE NONE	MATERIAL
CHK'D	DATE	DRAWING
TRACED	APP'D	


R-15
R-16
R-17
R-18
WIRING DIAGRAM
TB-11
18"
20"
2 1/2" TYP.
2" TYP.
RELAY SUB-PANEL
MOUNTED IN SECTION P-7
RIGHT HAND SIDE
PLANT CONNECTION DIAGRAM, DWG# 10058 & 10070
LOCATED CENTER OF PANEL P-7
REFER TO DWG# 10063 3 of 7







TBT2 MODIFICATION ONLY

PANEL P6

STEP NUMBER	CONTROL TO ADVANCE	A FILTER #1	B FILTER #2	C FILTER #3	D FILTER #4	E CLEARWELL	F FUTURE	G R/I WIPER INPUT	H FILTER #1 SAMPLE	I FILTER #2 SAMPLE	J FILTER #3 SAMPLE	K FILTER #4 SAMPLE	L CLEARWELL SAMPLE	M FUTURE SAMPLE	N FUTURE SAMPLE	O SPARE	P SPARE	Q SPARE	R SPARE	S SPARE	T HOME
1	TR							X	X												X
2	TR						X			X											X
3	TR					X					X										X
4	TR				X							X									X
5	TR			X									X								X
6	SWT		X											X							X **
7	SWT	X													X						X **
8	SWT																				
9	SWT																				
10	SWT																				
11	SWT																				
12	SWT																				

X - INDICATES SWITCH ACTUATION.

** TO ACTIVATE TWO FUTURE POSITION INSERT DRUM PROGRAMMER PINS IN POSITIONS INDICATED AND CONNECT SAMPLE LINES TO BULKHEAD FITTINGS PROVIDED.

FINISHED WATER TURBIDITY PROGRAMMER

PANEL P6

STEP NUMBER	CONTROL TO ADVANCE	A KANNAH CREEK	B HALLENBECK	C RAW WATER	D FILTER INFLUENT	E R/I WIPER INPUT	F KANNAH CREEK SAMPLE	G HALLENBECK SAMPLE	H RAW WATER SAMPLE	I FILTER INFL. SAMPLE	J WASTE WATER SAMPLE	K SPARE	L SPARE	M SPARE	N SPARE	O SPARE	P SPARE	Q SPARE	R SPARE	S SPARE	T HOME
1	TR					X	X													X	X
2	TR				X			X												X	X
3	TR			X					X											X	X
4	TR	X								X										X	X
5	TR	X									X										**
6	SWT																				
7	SWT																				
8	SWT																				
9	SWT																				
10	SWT																				
11	SWT																				
12	SWT																				

X - INDICATES SWITCH ACTUATION.

** - TO ACTIVATE FUTURE POSITION INSERT DRUM PROGRAMMER PINS IN POSITIONS INDICATED AND CONNECT SAMPLE LINES TO BULKHEAD FITTINGS PROVIDED.

RAW WATER TURBIDITY PROGRAMMER

PANEL P6

DRAWING NOTES:

1. WHEN PURCHASING PROGRAMMERS, PROVIDE SUPPLIER WITH A COPY OF THIS DRAWING FOR PROGRAM DATA.
2. FOR PHYSICAL LOCATION & CONNECTIONS SEE DRAWINGS #10065 SHTS #5 & #6.

Removed
Abandoned Prior To 1978
10065

REVISIONS			CHARLES CAMPBELL & CO.
NO	DATE	BY	TURBIDITY PROGRAMMER SCHEDULE
1	9-19-68	RCD	SHOWING LOCATION WITH TBT2 MODIFICATION
2	2-26-69	DLF	
3	5-23-69	DLF	DRAWN BY DLF; SCALE NONE; DATE
4			CHK'D; DATE
5			TRACED; APPD

WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS
1			81			161			241	10069	FLASH MIXER #2	321		
2			82			162			242			322		
3			83			163			243	10069	SERVICE WTR. PUMP#1	323		
4			84			164			244	10069	SERVICE WTR. PUMP#1	324		
5			85			165			245			325	-	10057-GRAPHIC
6			86			166			246	10069	SERVICE WTR. PUMP#1	326	-	10057-GRAPHIC
7			87			167			247	10069	SERVICE WTR. PUMP#1	327	-	10057-GRAPHIC
8			88			168			248			328	-	10057-GRAPHIC
9			89			169			249	10069	SERVICE WTR. PUMP#2	329	-	10057-GRAPHIC
10			90			170			250	10069	SERVICE WTR. PUMP#2	330	-	10057-GRAPHIC
11			91			171			251			331	-	10057-GRAPHIC
12			92			172			252	10069	SERVICE WTR. PUMP#2	332	-	10057-GRAPHIC
13			93			173			253	10069	SERVICE WTR. PUMP#2	333	-	10057-GRAPHIC
14			94			174			254	10069	HAL.INFL.-RWC-5	334	-	10057-GRAPHIC
15			95			175			255	10069	HAL.INFL.-RWC-5	335	-	10057-GRAPHIC
16			96			176			256	10069	KALLDRK.INFL.-RWC-4	336	-	10057-GRAPHIC
17			97			177			257	10069	KALLDRK.INFL.-RWC-4	337	-	10057-GRAPHIC
18			98			178			258	10069	IRRIG. VALVE-SOV	338	-	10057-GRAPHIC
19			99			179			259			339		
20			100			180			260	10069	SURF. WASH-PUMP	340		
21			101	-	10067-SHEET#4	181			261	10069	SURF. WASH-PUMP	341		
22			102	-	10067-SHEET#4	182			262	10069	SURF. WASH-PUMP	342		
23			103	-	10067-SHEET#3	183			263	10069	SURF. WASH PUMP	343	-	10057-GRAPHIC
24			104	-	10067-SHEET#3	184			264	10069	SURF. WASH PUMP	344	-	10057-GRAPHIC
25			105	-	10067-SHEET#2	185			265	10069	SURF. WASH PUMP	345	-	10057-GRAPHIC
26			106	-	10067-SHEET#1	186			266		10063, SHEET#3	346	-	10057-GRAPHIC
27			107	-	10067-SHEET#7	187			267		10063, SHEET#3	347		
28			108	-	10067-SHEET#8	188			268		10063, SHEET#3	348		
29			109	-	10067-SHEET#9	189			269		10063, SHEET#3	349	-	10057-GRAPHIC
30			110	-	10067-SHEET#10	190			270	10069	FLASH MIXER #1	350	-	10057-GRAPHIC
31			111	11	10065	191			271	10069	FLASH MIXER #2	351	-	10057-GRAPHIC
32			112	38	10065	192			272	10069	SERVICE WTR PUMP#1	352	-	10057-GRAPHIC
33			113	-	10067-SHEET#21	193			273	10069	SERVICE WTR PUMP#2	353	-	10057-GRAPHIC
34			114	-	10067-SHEET#20	194			274	10069	RAW WATER PUMP	354	-	10057-GRAPHIC
35			115	-	10067-SHEET#19	195			275			355	-	10057-GRAPHIC
36			116	-	10067-SHEET#18	196			276			356	-	10057-GRAPHIC
37			117	-	10067-SHEET#20	197			277			357		
38			118	-	10067-SHEET#22	198			278	10069	WASH WTR PUMP#1	358		
39			119	-	10067-SHEET#17	199			279	10069	WASH WTR PUMP#1	359		
40			120	-	10067-SHEET#11	200	10069	SURF. WASH PUMP	280	10069	GRAPHIC PNL-POS.	360		
41			121	-	10067-SHEET#12	201	10069	SURF. WASH PUMP	281	10069	WASH WTR. PUMP#1	361	-	10057-GRAPHIC
42			122	-	10067-SHEET#16	202	10069	SURF. WASH PUMP	282	10069	GRAPHIC PNL-NEG.	362	-	10057-GRAPHIC
43			123	-	10067-SHEET#16	203	10069	SURF. WASH PUMP	283	10069	RAW WTR. PUMP	363	-	10057-GRAPHIC
44			124	-	10067-SHEET#15	204	10069	SURF. WASH PUMP	284	10069	SERVICE WTR. PUMP#1	364	-	10057-GRAPHIC
45			125	-	10067-SHEET#15	205	10069	WASH WTR. PUMP#2	285	10069	SERVICE WTR. PUMP#2	365		
46			126	-	10067-SHEET#14	206	10069	WASH WTR. PUMP#1	286	10069	FLASH MIXER #1	366		
47			127	-	10067-SHEET#14	207	10069	WASH WTR. PUMP#1	287	10069	FLASH MIXER #2	367	-	10057-GRAPHIC
48			128	-	10067-SHEET#16	208	10069	RAW WTR. PUMP	288	10069	FLASH MIXER #1	368	-	10057-GRAPHIC
49			129	-	10067-SHEET#16	209	10069	RAW WTR. PUMP	289	10069	FLASH MIXER #2	369	-	10057-GRAPHIC
50			130	-	10067-SHEET#17	210	10069	RAW WTR. PUMP	290	10069	SERVICE WTR #1	370	-	10057-GRAPHIC
51			131	-	10067-SHEET#17	211	10069	RAW WTR. PUMP	291	10069	SERVICE WTR #2	371	-	10057-GRAPHIC
52			132	-	10067-SHEET#17	212	10069	RAW WTR. PUMP	292	10069	RAW WATER PUMP	372	-	10057-GRAPHIC
53			133	-	10067-SHEET#4	213	10069	RAW WTR. PUMP	293			373	-	10057-GRAPHIC
54			134	-	10067-SHEET#3	214	10069	RAW WTR. PUMP	294	10069	IRRIG. VALVE	374	-	10057-GRAPHIC
55			135			215	10069	WASH WTR. PUMP#2	295	10069	IRRIG. VALVE	375		
56			136	-	10057-ALARM	216	10069	RAW WTR. PUMP	296	10069	IRRIG. VALVE	376		
57			137			217	10069	WASH WTR. PUMP#1	297	10069	IRRIG. VALVE	377		
58			138			218	10069	WASH WTR. PUMP#1	298	10069	WASH WTR. PUMP#2	378		
59			139			219	10069	WASH WTR. PUMP#1	299	10069	SURF. WASH PUMP	379	-	10057-GRAPHIC
60			140			220	10069	WASH WTR. PUMP#1	300	-	10057-ALARM	380	-	10057-GRAPHIC
61			141			221	10069	WASH WTR. PUMP#1	301	-	10057-ALARM	381	-	10057-GRAPHIC
62			142			222	10069	WASH WTR. PUMP#1	302	-	10057-ALARM	382	-	10057-GRAPHIC
63			143			223	10069	WASH WTR. PUMP#1	303	-	10057-ALARM	383		
64			144			224	10069	WASH WTR. PUMP#1	304	-	10057-ALARM	384		
65			145			225	10069	WASH WTR. PUMP#2	305	-	10057-ALARM	385	-	10057-GRAPHIC
66			146			226	10069	WASH WTR. PUMP#2	306	-	10057-ALARM	386	-	10057-GRAPHIC
67			147			227	10069	WASH WTR. PUMP#2	307	-	10057-ALARM	387	-	10057-GRAPHIC
68			148			228	10069	WASH WTR. PUMP#2	308	-	10057-ALARM	388	-	10057-GRAPHIC
69			149			229	10069	WASH WTR. PUMP#2	309	-	10057-ALARM	389	-	10057-GRAPHIC
70			150	10054	HYDRO-PNEUMATIC TANK	230	10069	WASH WTR. PUMP#2	310	-	10057-ALARM	390	-	10057-GRAPHIC
71			151	10054	HYDRO-PNEUMATIC TANK	231	10069	WASH WTR. PUMP#2	311			391	-	10057-GRAPHIC
72			152	10054	HYDRO-PNEUMATIC TANK	232	10069	WASH WTR. PUMP#2	312			392	-	10057-GRAPHIC
73			153	10054	HYDRO-PNEUMATIC TANK	233	10069	FLASH MIXER #1	313			393	-	10057-GRAPHIC
74			154	10054	HYDRO-PNEUMATIC TANK	234	10069	WASH WTR. PUMP#2	314			394	-	10057-GRAPHIC
75			155	10054	HYDRO-PNEUMATIC TANK	235	10069	FLASH MIXER #1	315	-	10057-GRAPHIC	395		
76			156	10054	HYDRO-PNEUMATIC TANK	236	10069	FLASH MIXER #1	316	-	10057-GRAPHIC	396		
77			157	10054	HYDRO-PNEUMATIC TANK	237			317	-	10057-GRAPHIC	397		
78			158	10054	HYDRO-PNEUMATIC TANK	238	10069	FLASH MIXER #2	318	-	10057-GRAPHIC	398		
79			159	10054	HYDRO-PNEUMATIC TANK	239	10069	FLASH MIXER #2	319	-	10057-GRAPHIC	399		
80			160	10054	HYDRO-PNEUMATIC TANK	240	10069	FLASH MIXER #2	320	-	10057-GRAPHIC	400		

WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS
401	-	10074	481			561	25	10065	641			721	9	10062
402	-	10074	482			562	39	10065	642			722	10	10062
403	-	10074	483			563	40	10065	643			723	11	10062
404	-	10074	484			564	41	10065	644			724	15	10062
405	-	10074	485			565	42	10065	645			725	16	10062
406	-	10074	486			566	45	10065	646			726	17	10062
407	-	10074	487			567	47	10065	647			727	18	10062
408	-	10074	488			568	48	10065	648			728	19	10062
409	-	10074	489			569	50	10065	649			729	21	10062
410	-	10074	490			570	50	10065	650		10072	730	22	10062
411	-	10074	491			571	50	10065	651		10072	731	23	10062
412	-	10074	492			572	51	10065	652		10072	732	24	10062
413	-	10074	493			573			653		10072	733	21	10062
414	-	10074	494			574			654		10072	734	25	10062
415	-	10074	495			575			655		10072	735	26	10062
416	-	10074	496			576			656		10072	736	26	10062
417	-	10074	497			577			657		10072	737	27	10062
418	-	10074	498			578			658		10072	738	30	10062
419	-	10074	499			579			659		10072	739	31	10062
420	-	10074	500			580			660		10072	740	36	10062
421			501	-	10067-SHEET#4	581			661		10072	741	36	10062
422			502	-	10067-SHEET#4	582			662		10072	742	36	10062
423			503	-	10067-SHEET#4	583			663		10072	743	36	10062
424			504	-	10067-SHEET#4	584			664		10072	744	41	10062
425			505	-	10067-SHEET#4	585			665		10072	745	41	10062
426			506	-	10067-SHEET#4	586			666		10072	746	41	10062
427			507	-	10067-SHEET#3	587			667		10072	747	41	10062
428			508	-	10067-SHEET#3	588			668		10072	748	47	10062
429			509	-	10067-SHEET#3	589			669		10072	749	47	10062
430			510	-	10067-SHEET#3	590			670		10072	750	49	10062
431			511	-	10067-SHEET#3	591			671		10072	751	56	10062
432			512	-	10067-SHEET#3	592			672		10072	752	58	10062
433			513	-	10067-SHEET#2	593			673		10072	753	56	10062
434			514	-	10067-SHEET#2	594			674		10072	754	56	10062
435			515	-	10067-SHEET#2	595			675		10072	755	57	10062
436			516	-	10067-SHEET#2	596			676		10072	756	58	10062
437			517	-	10067-SHEET#2	597			677		10072	757	59	10062
438			518	-	10067-SHEET#2	598			678			758	61	10062
439			519	-	10067-SHEET#2	599			679			759	61	10062
440			520	-	10067-SHEET#2	600			680			760	62	10062
441			521	-	10067-SHEET#2	601	-	10067-SHEET#7	681			761	60	10062
442			522	-	10067-SHEET#2	602	-	10067-SHEET#7	682			762	64	10062
443			523	2	10065	603	-	10067-SHEET#8	683			763	66	10062
444			524	3	10065	604	-	10067-SHEET#8	684			764	71	10062
445			525	4	10065	605	-	10067-SHEET#8	685			765	76	10062
446			526	5	10065	606	-	10067-SHEET#8	686			766	81	10062
447			527	6	10065	607	-	10067-SHEET#8	687			767	86	10062
448			528	7	10065	608	-	10067-SHEET#9	688			768	91	10062
449			529	51	10065	609	-	10067-SHEET#9	689			769	96	10062
450			530	52	10065	610	-	10067-SHEET#9	690		10062	770	101	10062
451			531	53	10065	611	-	10067-SHEET#10	691		10062	771	106	10062
452			532	54	10065	612	-	10067-SHEET#10	692		10062	772	102	10062
453			533	-	10067-SHEET#1	613	-	10067-SHEET#10	693		10062	773	111	10062
454			534	-	10067-SHEET#1	614	-	10071	694			774	116	10062
455			535	-	10067-SHEET#6	615	-	10071	695			775	32	10062
456			536	-	10067-SHEET#6	616	-	10071	696			776	82	10062
457			537	-	10067-SHEET#6	617	-	10071	697			777	122	10062
458			538	-	10067-SHEET#6	618	-	10071	698			778		
459			539	-	10067-SHEET#6	619	-	10071	699			779		
460			540	-	10067-SHEET#6	620	-	10071	700			780	134	10062
461			541	-	10067-SHEET#5	621	-	10071	701	-	10067-SHEET#17	781		
462			542	-	10067-SHEET#5	622	-	10071	702	-	10067-SHEET#17	782		
463			543	-	10067-SHEET#5	623	-	10071	703	-	10067-SHEET#17	783	137	10062
464			544	-	10067-SHEET#5	624	-	10071	704	-	10067-SHEET#17	784	137	10062
465			545	-	10067-SHEET#5	625	-	10071	705	-	10067-SHEET#17	785	138	10062
466			546	-	10067-SHEET#5	626	-	10071	706	-	10067-SHEET#17	786	139	10062
467			547		10067-SHEET#5	627	-	10071	707	-	10067-SHEET#17	787	139	10062
468			548		10067-SHEET#5	628			708	-	10067-SHEET#17	788	140	10062
469			549			629			709	-	10067-SHEET#17	789	141	10062
470			550	-	10067-SHEET#4	630			710	-	10067-SHEET#17	790	141	10062
471			551		10067-SHEET#4	631			711	1	10062	791	145	10062
472			552	11	10065	632			712	1	10062	792	146	10062
473			553	12	10065	633			713	3	10062	793		
474			554	14	10065	634			714	3	10062	794	148	10062
475			555	15	10065	635			715	4	10062	795		10062
476			556	16	10065	636			716	5	10062	796		10062
477			557	17	10065	637			717	6	10062	797		10062
478			558	18	10065	638			718	7	10062	798		10062
479			559	20	10065	639			719	7	10062	799		10062
480			560	22	10065	640			720	8	10062	800		

WIRE	LINE	REMARKS	WIRE	LINE	REMARKS	WIRE	LINE	REMARKS
801	-	10067-SHEET#11	876	-	10067-SHEET#17	951		
802	-	10067-SHEET#11	877	-	10067-SHEET#17	952		
803	-	10067-SHEET#11	878	-	10067-SHEET#17	953		
804	-	10067-SHEET#11	879	-	10067-SHEET#17	954		
805	-	10067-SHEET#12	880	-	10067-SHEET#17	955		
806	-	10067-SHEET#12	881	-	10067-SHEET#17	956		
807	-	10067-SHEET#16	882	-	10067, SHEET#16	957		
808	-	10067-SHEET#16	883	-	10067, SHEET#16	958		
809	-	10067-SHEET#16	884	-	10067, SHEET#15	959		
810	-	10067-SHEET#16	885	-	10067, SHEET#15	960		
811	-	10067-SHEET#16	886	-	10067, SHEET#14	961		
812	-	10067-SHEET#16	887	-	10067, SHEET#14	962		
813	-	10067-SHEET#16	888	-	10067, SHEET#13	963		
814	-	10067-SHEET#16	889	-	10067, SHEET#13	964		
815	-	10067-SHEET#16	890		10052, SHEET#4	965		
816	-	10067-SHEET#16	891		10052, SHEET#4	966		
817	-	10067-SHEET#16	892		10052, SHEET#4	967		
818	-	10067-SHEET#16	893		10052, SHEET#3	968		
819	-	10067-SHEET#16	894		10052, SHEET#3	969		
820	-	10067-SHEET#16	895		10052, SHEET#3	970		
821	-	10067-SHEET#16	896		10052, SHEET#2	971		
822	-	10067-SHEET#16	897		10052, SHEET#2	972		
823	-	10067-SHEET#15	898		10052, SHEET#2	973		
824	-	10067-SHEET#15	899		10052, SHEET#1	974		
825	-	10067-SHEET#15	900		10052, SHEET#1	975		
826	-	10067-SHEET#15	901		10052, SHEET#1	976		
827	-	10067-SHEET#15	902			977		
828	-	10067-SHEET#14	903		10052, SHEET#1			
829	-	10067-SHEET#14	904		10052, SHEET#1			
830	-	10067-SHEET#14	905		10052, SHEET#1			
831	-	10067-SHEET#14	906		[illegible]			
832	-	10067-SHEET#14						
833	-	10067-SHEET#14						
834	-	10067-SHEET#14						
835	-	10067-SHEET#14						
836	-	10067-SHEET#14						
837	-	10067-SHEET#14						
838	-	10067-SHEET#15						
839	-	10067-SHEET#15						
840	-	10067-SHEET#15						
841	-	10067-SHEET#16						
842	-	10067-SHEET#15	917					
843	-	10067-SHEET#15	918					
844	-	10067-SHEET#15	919					
845	-	10067-SHEET#15	920					
846	-	10067-SHEET#15	921					
847	-	10067-SHEET#15	922					
848	-	10067-SHEET#21	923					
849	-	10067-SHEET#21	924					
850	-	10067-SHEET#21	925					
851	-	10067-SHEET#21	926			1001		
852	-	10067-SHEET#21	927			1002		
853	-	10067-SHEET#21	928			1003		
854	-	10067-SHEET#21	929			1004		
855	-	10067-SHEET#20	930			1005		
856	-	10067-SHEET#20	931			1006		
857	-	10067-SHEET#18	932			1007		
858	-	10067-SHEET#18	933			1008		
859	-	10067-SHEET#18	934			1009		
860	-	10067-SHEET#18	935			1010		
861	-	10067-SHEET#17	936			1011		
862	-	10067-SHEET#17	937			1012		
863	-	10067-SHEET#17	938			1013		
864	-	10067-SHEET#17	939			1014		
865	-	10067-SHEET#17	940			1015		
866	-	10067-SHEET#17	941			1016		
867	-	10067-SHEET#17	942			1017		
868	-	10067-SHEET#17	943			1018		
869	-	10067-SHEET#17	944			1019		
870	-	10067-SHEET#17	945			1020		
871	-	10067-SHEET#17	946			1021		
872	-	10067-SHEET#17	947			1022		
873	-	10067-SHEET#17	948			1023		
874	-	10067-SHEET#20	949			1024		
875	-	10067-SHEET#20	950			1025		

10068

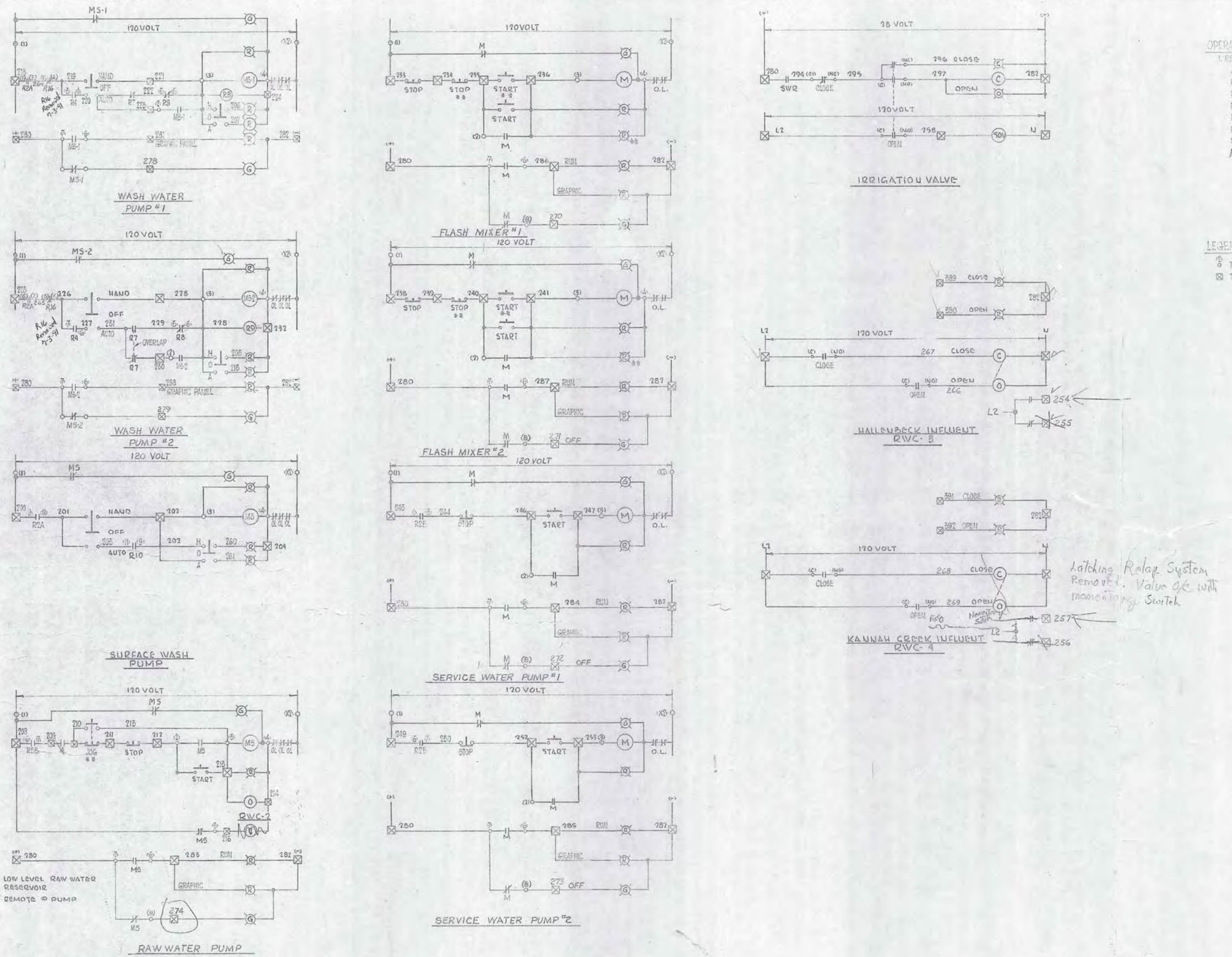
REVISIONS		
NO.	DATE	BY
1	9-19-68	RCD
2	2-26-69	DLZ
3	3-4-69	DLZ
4	3-?-69	DLZ

GOBLE SAMPSO...

DRAWN BY

CHK'D

TRACED



OPERATING NOTES

1. RELAY FUNCTION

- L2 CLEARWELL LOW LEVEL SHUTDOWN
- R4 AUTO WASH START
- R5 MAIN PLANT SHUTDOWN
- R7 PUMP ALTERNATION
- R8 INTERLOCK
- R9 INTERLOCK
- R10 SURFACE WASH CONTROL
- R16 High Filter level wash water pump shutdown

LEGEND

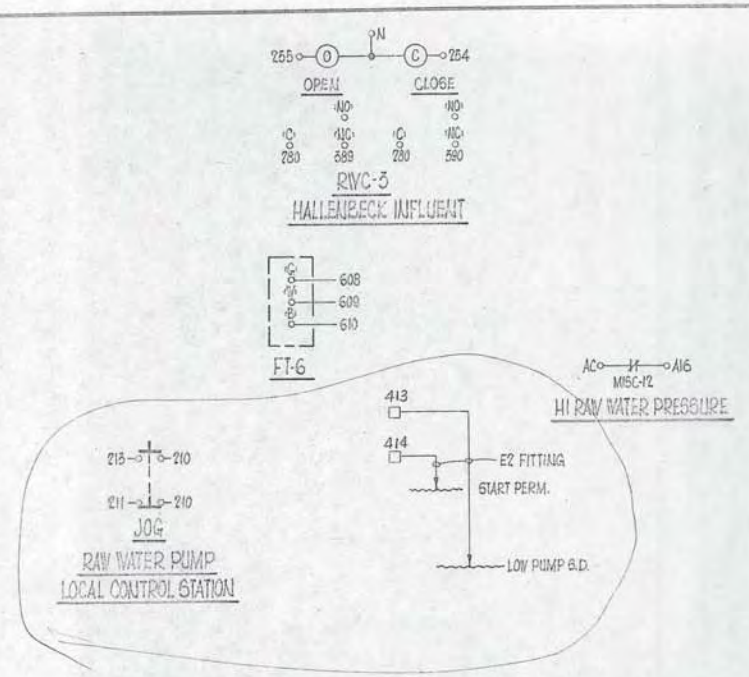
- TERMINAL ON EQUIPMENT MANUFACTURERS NUMBER.
- ⊠ TERMINAL BLOCK IN MAIN CONTROL PANEL.

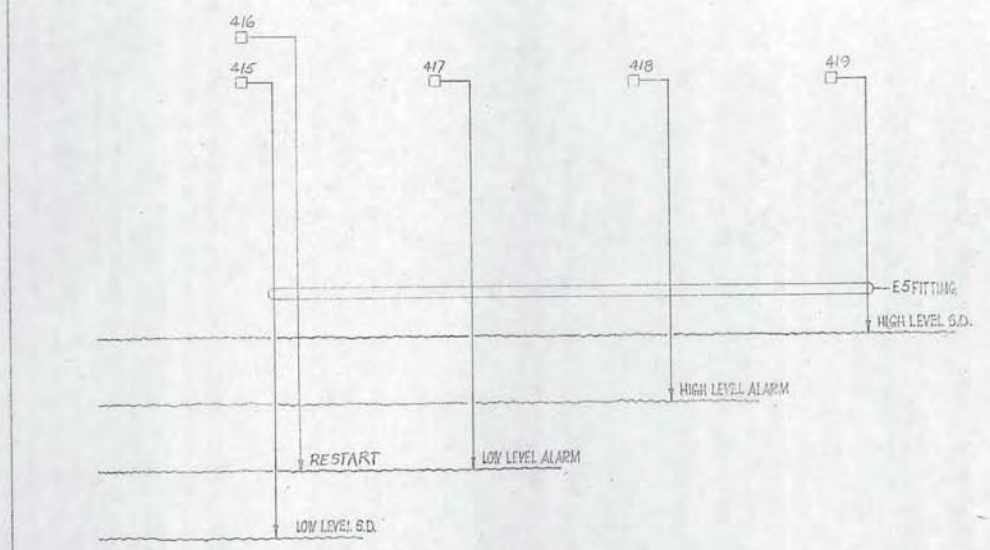
10069

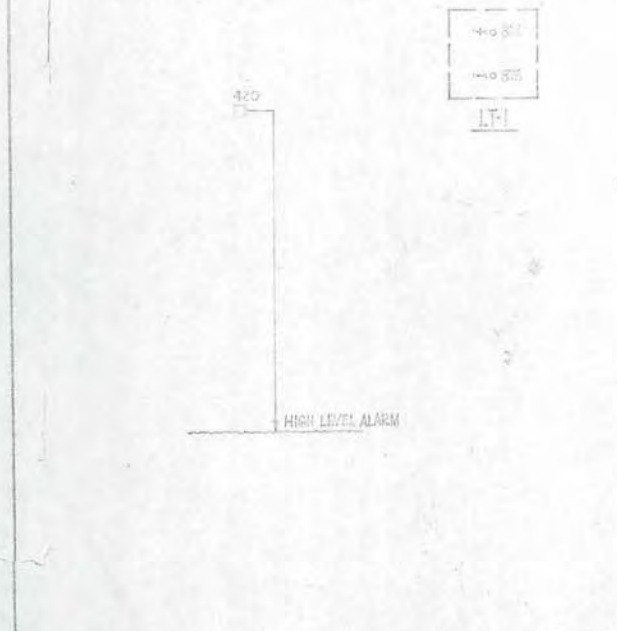
REVISIONS		
NO.	DATE	BY
1	8-19-68	RCD
2	10/11/68	SGD
3	3-4-69	DLZ
4	[illegible]	[illegible]
5		

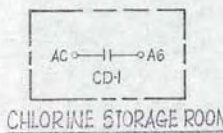
GOBLE-SAMPSON-ASSOC. DENVER

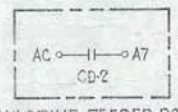
PUMP & VALVE WIRING DIAGRAM

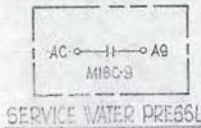

255
O
N
C
254
OPEN
CLOSE
280
589
280
590
RWC-3
HALLENBECK INFLUENT
257
O
N
C
256
OPEN
CLOSE
280
591
280
592
RWC-4
KANNAH CREEK INFLUENT
608
609
610
FT-6
611
612
613
FT-5
AC
M16C-12
A16
HI RAW WATER PRESSURE
413
414
E2 FITTING
START PERM.
LOW PUMP S.D.
213
210
211
210
JOG
RAW WATER PUMP
LOCAL CONTROL STATION
OPEN
CLOSE
280
587
280
587
RWC-2
RAW WATER SUCTION
RAW WATER CONTROL VAULT

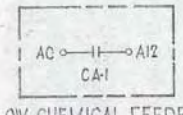

416
415
417
418
419
E5 FITTING
HIGH LEVEL S.D.
HIGH LEVEL ALARM
RESTART
LOW LEVEL ALARM
LOW LEVEL S.D.
CLEARWELL ALARM & SHUTDOWN

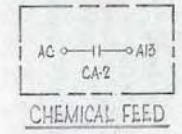

420
LT-1
HIGH LEVEL ALARM
CONTACT BASIN HIGH LEVEL ALARM & TRANSMITTER

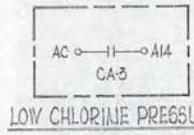

AC
CD-1
A6
CHLORINE STORAGE ROOM

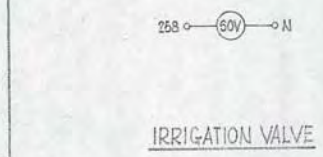

AC
CD-2
A7
CHLORINE FEEDER ROOM

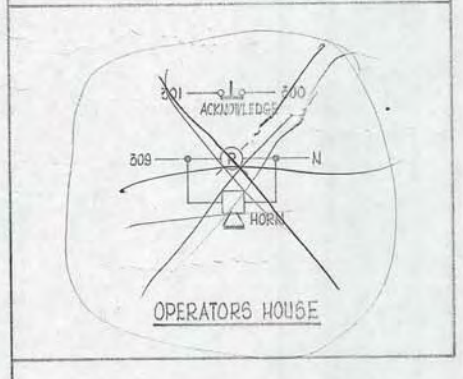

AC
M18C-9
A8
SERVICE WATER PRESSURE

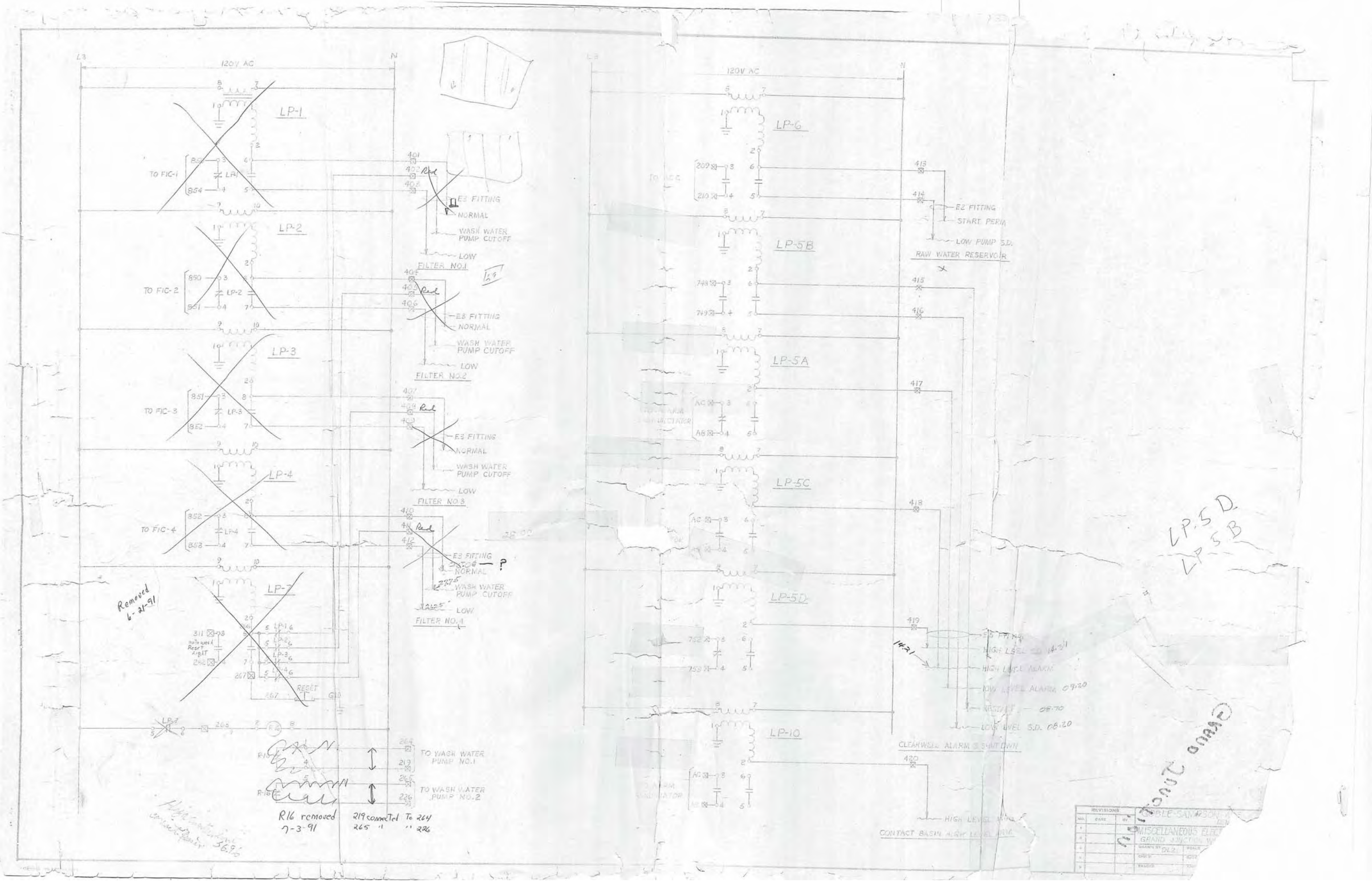

AC
CA-1
A12
LOW CHEMICAL FEEDER

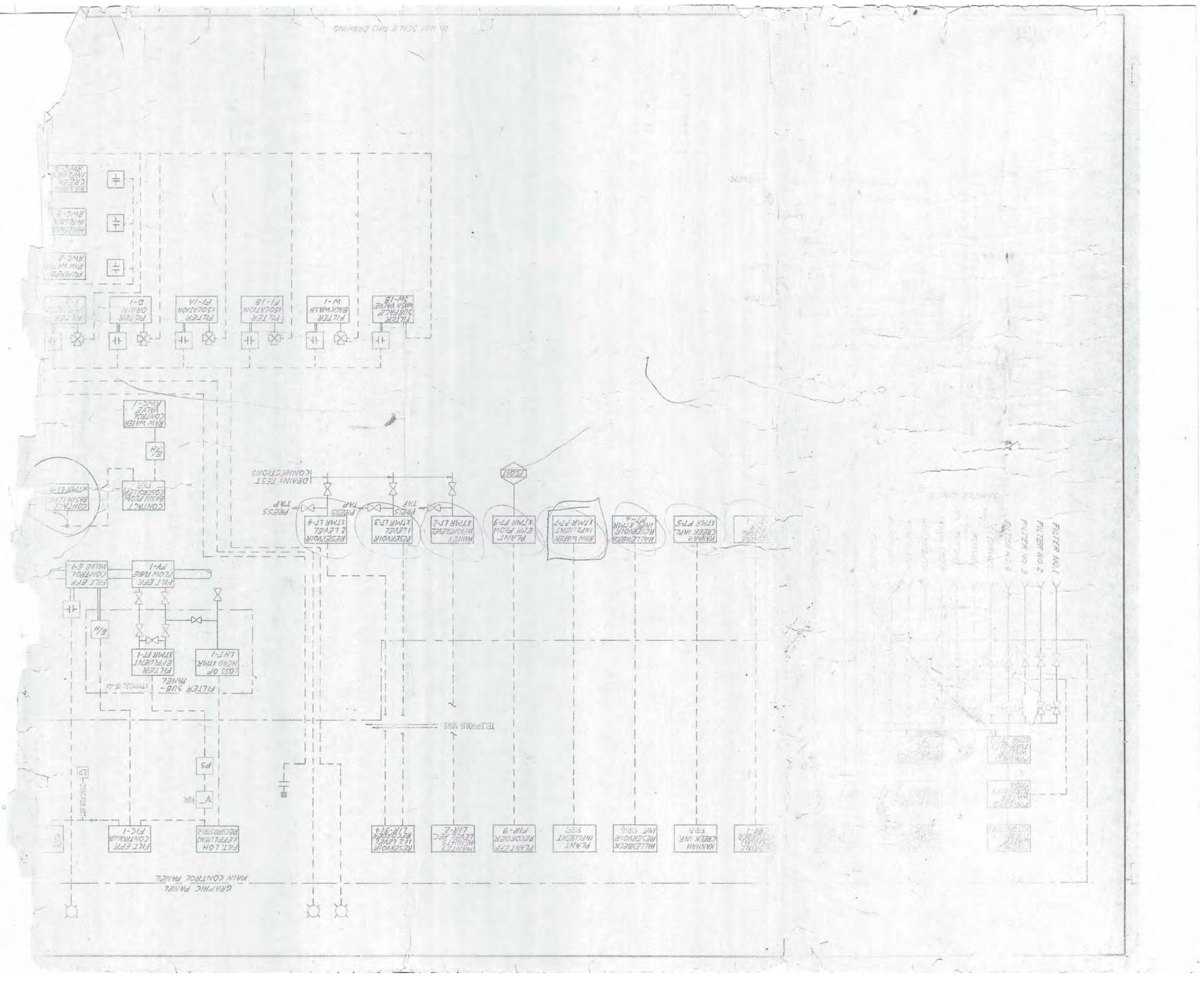

AC
CA-2
A13
CHEMICAL FEED


AC
CA-3
A14
LOW CHLORINE PRESSURE


258
60V
N
IRRIGATION VALVE


501
ACKNOWLEDGE
500
509
R
N
HORN
OPERATORS HOUSE


120V AC
L3
N
LP-1
LP-2
LP-3
LP-4
LP-7
TO FIC-1
TO FIC-2
TO FIC-3
TO FIC-4
E3 FITTING
NORMAL
WASH WATER PUMP CUTOFF
LOW
FILTER NO.1
FILTER NO.2
FILTER NO.3
FILTER NO.4
TO WASH WATER PUMP NO.1
TO WASH WATER PUMP NO.2
RESET
Removed 6-21-91
R16 removed 7-3-91
219 connected To 264
265 " " 226
LP-6
LP-5B
LP-5A
LP-5C
LP-5D
LP-10
TO ACC
E2 FITTING
START PERIA
LOW PUMP S.D.
RAW WATER RESERVOIR
HIGH LEVEL ALARM
LOW LEVEL ALARM 09:20
LOW LEVEL S.D. 08:20
CLEARWELL ALARM & SHUTDOWN
CONTACT BASIN HIGH LEVEL ALARM
LP-5D
LP-5B
Grand Junction
MISCELLANEOUS ELEC
GRAND JUNCTION


GRAPHIC PANEL
MAIN CONTROL PANEL
KANNAH CREEK INF. FIR-5
HALLENBECK RESERVOIR INF. FIR-6
PLANT INFLUENT FIR-7
PLANT EFF RECORDER FIR-9
MANTEY HEIGHTS LEVEL REC. LIR-2
RESERVOIR 1 & 2 LEVEL RECORDER LIR-3 & 4
FILT. LOH & EFFLUENT RECORD. FIRH-1
FILT. EFF. CONTROLLER FIC-1
FBR
PS
CASCADE SET
LP
TELEPHONE WIRE
FILTER SUB-PANEL
(TYPICAL OF 4)
LOSS OF HEAD XTMR LHT-1
FILTER EFFLUENT XTMR FT-1
E/H
FILT. EFF. FLOW TUBE FV-1
FILT. EFF. CONTROL VALVE E-1
KANNAH CREEK INFL. XTMR FT-5
HALLENBECK RESERVOIR INFL. XTMR FT-6
RAW WATER INFLUENT XTMR FT-7
PLANT EFF. FLOW XTMR FT-9
FLOAT
MANTEY HEIGHTS LEVEL XTMR LT-2
RESERVOIR 1 LEVEL XTMR LT-3
RESERVOIR 2 LEVEL XTMR LT-4
PRESS TAP
PRESS TAP
PRESS TAP
DRAIN & TEST CONNECTIONS
CONTACT BASIN FLOW CONTROLLER FIC-1
CONTACT BASIN LEVEL XTMR LT-
E/H
RAW WATER CONTROL VALVE RWC-1
FILTER SURFACE WASH VALVE SW-1B
FILTER BACKWASH W-1
FILTER ISOLATION FI-1B
FILTER ISOLATION FI-1A
FILTER DRAIN D-1
PUMPED RAW WATER RWC-2
HALLENBECK INFLUENT RWC-3
KANNAH CREEK INFLUENT RWC-4
FINISHED WATER TURBIDITY PROG.
FINISHED WATER TURBIDITY XTMR
FILTER NO. 1
FILTER NO. 2
FILTER NO. 3
FILTER NO. 4
SAMPLE LINES
DO NOT SCALE THIS DRAWING

Toshiba Connections for Backwash & Filter ProgramToshiba Unit #2

POINT	POINT TYPE	TAG TYPE	TAG NAME	TAG ID	EXPANDED ID	MODULE	POINT	TERM+	TERM_	B_U_M_P	Wire No.+	Wire Non -
1	AI	MA	LI_001	PV	BASIN LEVEL	0	1	2	1	00_01_01_00_01	874	875
2	AI	PID	FI_002	PV	FILTER 2 FLOW	0	2	4	3	00_01_01_00_02	817	819
3	AI	PID	F2_002	PV	BACKWASH FLOW	0	3	6	5	00_01_01_00_03	862	861
4	AO	MA	LI_001	MV	CB REMOTE SP OU	1	1	2	1	00_01_01_01_01	510	509
5	AO	PID	F2_002	MV	FILTER 2 VALVE POSITION	1	2	4	3	00_01_01_01_02	856	855
6	AO	PID	FI_002	MV	BW VFD SPEED OUTPUT	1	3	6	5	00_01_01_01_03	871	869
7	AO	MA	FI_002R	MV	FILTER 2 OUTPUT REC	1	5	10	9	00_01_01_01_05	822	823
8	DI	PB	N_001	FI1	START BACKWASH	2	1	A1	B10	00_01_01_02_01	DI1 776	
9	DI	PB	N_001	FI2	EXTEND BACKWASH	2	2	A2	B10	00_01_01_02_02	DI2 799	
10	DO	PB	X_001	FO1	BACKWASH PUMP	3	1	A1	B10	00_01_01_03_01	DO1 776	R1
11	DO	PB	X_002	FO1	PULSE TO STEPPER	3	2	A2	B10	00_01_01_03_02	DO3 735	R2
12	DO	PB	X_001	FO2	SW PUMP	3	3	A3	B10	00_01_01_03_03	DO2	R3
13	DO	PB	X_002	FO2	BACKWASH TOTALIZER	3	4	A4	B10	00_01_01_03_04	DO4 865	R4
14	DO	PB	X_003	FO1	HIGH BASIN LEVEL ALARM	3	5	A5	B10	00_01_01_03_05	DO5	R5 & R8
15	DO	PB	X_004	FO1	FILTER TOTALIZER PULSE	3	6	A6	B10	00_01_01_03_06		
16	DO	PB	X_004	FO2	FILTER 2 RECDATA ON	3	8	A8	B10	00_01_01_03_08	DO8	R6
19	AI	PID	FI_003	PV	FILTER 3 FLOW	0	6	14	13	00_01_01_00_06	828	830
20	AO	MA	FI_003R	MV	FILTER 3 OUTPUT REC	1	4	8	7	00_01_01_01_04	833	834
22	AO	PID	FI_003	MV	FILTER 3 VALVE POSITION	1	7	14	13	00_01_01_01_07	858	857
23	DO	PB	X_004	FO3	FILTER 3 RECDATA ON	3	7	A7	B10	00_01_01_03_07	DO7	R7

Toshiba Connections for Backwash & Filter ProgramToshiba Unit #1

POINT	POINT TYPE	TAG TYPE	TAG NAME	TAG ID	EXPANDED ID	MODULE	POINT	TERM+	TERM_	B_U_M_P	Wire No.+	Wire Non -
1	AI	MA	LI_001	PV	BASIN LEVEL	0	1	2	1	00_01_01_00_01	874	875
2	AI	PID	FI_001	PV	FILTER 1 FLOW	0	2	4	3	00_01_01_00_02	809	807
3	AI	PID	F2_002	PV	BACKWASH FLOW	0	3	6	5	00_01_01_00_03	862	861
4	AO	MA	LI_001	MV	CB REMOTE SP OU	1	1	2	1	00_01_01_01_01	510	509
5	AO	PID	F1_001	MV	FILTER 1 VALVE POSITION	1	2	4	3	00_01_01_01_02	848	849
6	AO	PID	FI_002	MV	BW VFD SPEED OUTPUT	1	3	6	5	00_01_01_01_03	871	869
7	AO	MA	FI_001R	MV	FILTER 1 OUTPUT REC	1	5	10	9	00_01_01_01_05	812	813
8	DI	PB	N_001	FI1	START BACKWASH	2	1	A1	B10	00_01_01_02_01	DI1 776	
9	DI	PB	N_002	FI2	EXTEND BACKWASH	2	2	A2	B10	00_01_01_02_02	DI2 799	
10	DO	PB	X_001	FO1	BACKWASH PUMP	3	1	A1	B10	00_01_01_03_01	DO1 736	R1
11	DO	PB	X_002	FO1	PULSE TO STEPPER	3	2	A2	B10	00_01_01_03_02	DO3 735	R2
12	DO	PB	X_001	FO2	SW PUMP	3	3	A3	B10	00_01_01_03_03	DO2 776	R3
13	DO	PB	X_002	FO2	BACKWASH TOTALIZER	3	4	A4	B10	00_01_01_03_04	DO4 865	R4
14	DO	PB	X_003	FO1	HIGH BASIN ALARM	3	5	A5	B10	00_01_01_03_05	DO5	R5 & R8
15	DO	PB	X_004	FO1	FILTER TOTALIZER PULSE	3	6	A6	B10	00_01_01_03_06		
16	DO	PB	X_004	FO2	FILTER 2 RECDATA ON	3	8	A8	B10	00_01_01_03_08	DO8	R6
19	AI	PID	FI_004	PV	FILTER 4 FLOW	0	6	14	13	00_01_01_00_06	840	838
20	AO	MA	FI_004R	MV	FILTER 4 OUTPUT REC	1	4	8	7	00_01_01_01_04	844	843
22	AO	PID	FI_004	MV	FILTER 4 VALVE POSITION	1	7	14	13	00_01_01_01_07	860	859
23	DO	PB	X_004	FO3	FILTER 4 RECDATA ON	3	7	A7	B10	00_01_01_03_07	DO7	R7

ProtocolID	DeviceNam	TagName	DataType	DataCount	Retentive	Address	ArrayStart	ArrayEnd
0	<INTERNA	MP-810 HC	Discrete	1	FALSE		0	0
0	<INTERNA	FI_400_SC	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_HO/	Signed_int	1	FALSE		0	0
0	<INTERNA	ANY_ALAF	Discrete	1	FALSE		0	0
0	<INTERNA	MP_400_C	Floating_P	1	FALSE		0	0
0	<INTERNA	MP-710 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-800 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-700 HC	Discrete	1	FALSE		0	0
0	<INTERNA	CF_STAR1	Floating_P	1	FALSE		0	0
0	<INTERNA	DOSING_S	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	AI_01_SC/	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	CHEMICAL	Unsigned_	1	FALSE		0	0
0	<INTERNA	PUMP STF	Floating_P	1	FALSE		0	0
0	<INTERNA	PUMP CAF	Floating_P	1	FALSE		0	0
404	DEV001	DO_0_9	Discrete	1	FALSE	O:0/09	0	0
404	DEV001	LOOP 1 AC	Discrete	1	FALSE	B3:16/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/05	0	0
404	DEV001	DO_0_7	Discrete	1	FALSE	O:0/07	0	0
404	DEV001	DO_0_10	Discrete	1	FALSE	O:0/10	0	0
404	DEV001	DO_0_8	Discrete	1	FALSE	O:0/08	0	0
404	DEV001	LOOP 2 AC	Discrete	1	FALSE	B3:16/01	0	0
404	DEV001	DO_0_11	Discrete	1	FALSE	O:0/11	0	0
404	DEV001	PROC1_S	Discrete	1	FALSE	B20:16/03	0	0
404	DEV001	HPTK1_IN	Discrete	1	FALSE	B21:8/00	0	0
404	DEV001	NO HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	ANY_BLW	Discrete	1	FALSE	B23:2/00	0	0
404	DEV001	BLW2_RU	Discrete	1	FALSE	B23:2/02	0	0
404	DEV001	DO_0_1	Discrete	1	FALSE	O:0/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/00	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/04	0	0
404	DEV001	VFD3_HAI	Discrete	1	FALSE	B22:6/01	0	0
404	DEV001	BLW1_RU	Discrete	1	FALSE	B23:2/01	0	0
404	DEV001	DI_0_11	Discrete	1	FALSE	I:0/11	0	0
404	DEV001	DI_0_0	Discrete	1	FALSE	I:0/00	0	0
404	DEV001	DI_0_1	Discrete	1	FALSE	I:0/01	0	0
404	DEV001	DI_0_2	Discrete	1	FALSE	I:0/02	0	0
404	DEV001	DI_0_3	Discrete	1	FALSE	I:0/03	0	0
404	DEV001	DI_0_4	Discrete	1	FALSE	I:0/04	0	0
404	DEV001	DI_0_5	Discrete	1	FALSE	I:0/05	0	0
404	DEV001	DI_0_6	Discrete	1	FALSE	I:0/06	0	0
404	DEV001	DI_0_7	Discrete	1	FALSE	I:0/07	0	0
404	DEV001	DI_0_8	Discrete	1	FALSE	I:0/08	0	0
404	DEV001	DO_0_3	Discrete	1	FALSE	O:0/03	0	0
404	DEV001	DI_0_10	Discrete	1	FALSE	I:0/10	0	0
404	DEV001	DO_0_6	Discrete	1	FALSE	O:0/06	0	0
404	DEV001	DI_0_12	Discrete	1	FALSE	I:0/12	0	0
404	DEV001	DI_0_13	Discrete	1	FALSE	I:0/13	0	0
404	DEV001	DI_0_14	Discrete	1	FALSE	I:0/14	0	0
404	DEV001	DI_0_15	Discrete	1	FALSE	I:0/15	0	0
404	DEV001	DO_0_0	Discrete	1	FALSE	O:0/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/04	0	0
404	DEV001	DO_0_2	Discrete	1	FALSE	O:0/02	0	0

404	DEV001	VFD3_FAL	Discrete	1	FALSE	B20:0/07	0	0
404	DEV001	DO_0_4	Discrete	1	FALSE	O:0/04	0	0
404	DEV001	DO_0_5	Discrete	1	FALSE	O:0/05	0	0
404	DEV001	DI_0_9	Discrete	1	FALSE	I:0/09	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.3	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/02	0	0
404	DEV001	MP_710_H	Signed_int	1	FALSE	N24:5	0	0
404	DEV001	MP_800_H	Signed_int	1	FALSE	N24:6	0	0
404	DEV001	MP_810_H	Signed_int	1	FALSE	N24:7	0	0
404	DEV001	MP_700_S	Signed_int	1	FALSE	N24:12	0	0
404	DEV001	MP_710_S	Signed_int	1	FALSE	N24:13	0	0
404	DEV001	PRE_MP_I	Signed_int	1	FALSE	N24:8	0	0
404	DEV001	POST_MP	Signed_int	1	FALSE	N24:9	0	0
404	DEV001	PRE_RES_	Signed_int	1	FALSE	N7:32	0	0
404	DEV001	BLOWER2	Signed_int	1	FALSE	N24:2	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.2	0	0
404	DEV001	BLOWER1	Signed_int	1	FALSE	N24:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.1	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:50	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.2	0	0
404	DEV001	START_UI	Unsigned_	1	FALSE	N9:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:8	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:9	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:10	0	0
404	DEV001	POST_RES	Signed_int	1	FALSE	N7:62	0	0
404	DEV001	NO_HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B22:6/02	0	0
404	DEV001	LOOP 3 A(	Discrete	1	FALSE	B3:16/02	0	0
404	DEV001	CELL12_F	Discrete	1	FALSE	B23:12/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/01	0	0
404	DEV001	BLW_DPS	Discrete	1	FALSE	B23:2/04	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/03	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:11/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/01	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/02	0	0
404	DEV001	MP_700_H	Signed_int	1	FALSE	N24:4	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/04	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B22:6/00	0	0
404	DEV001	ENABLE R	Discrete	1	FALSE	B20:30/03	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/04	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/01	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/00	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:8/06	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:8/05	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/03	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/04	0	0
404	DEV001	H2_COM_A	Discrete	1	FALSE	B23:2/09	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/03	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:26/05	0	0
404	DEV001	CELL22_C	Discrete	1	FALSE	B20:20/08	0	0
404	DEV001	CELL22_F	Discrete	1	FALSE	B23:22/02	0	0
404	DEV001	RECT2_FA	Discrete	1	FALSE	B23:20/00	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/02	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/03	0	0

404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/07	0	0
404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/08	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/01	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/02	0	0
404	DEV001	LAL_201	Discrete	1	FALSE	B23:5/06	0	0
404	DEV001	RACK2_AL	Discrete	1	FALSE	B20:9/02	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/06	0	0
404	DEV001	PROC2_RI	Discrete	1	FALSE	B20:26/04	0	0
404	DEV001	PROC2_ST	Discrete	1	FALSE	B20:26/03	0	0
404	DEV001	ANY_BRIN	Discrete	1	FALSE	B23:3/02	0	0
404	DEV001	NO_BLW_	Discrete	1	FALSE	B23:2/10	0	0
404	DEV001	BLW_610_	Discrete	1	FALSE	B20:1/08	0	0
404	DEV001	BLW_600_	Discrete	1	FALSE	B20:1/07	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/11	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/12	0	0
404	DEV001	RECT1_AM	Discrete	1	FALSE	B23:10/07	0	0
404	DEV001	RACK1_AL	Discrete	1	FALSE	B20:9/01	0	0
404	DEV001	CELL21_C	Discrete	1	FALSE	B20:20/07	0	0
404	DEV001	DI_0_17	Discrete	1	FALSE	I:0/17	0	0
404	DEV001	DI_0_18	Discrete	1	FALSE	I:0/18	0	0
404	DEV001	DI_0_19	Discrete	1	FALSE	I:0/19	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:3/00	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:3/01	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:2/07	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:8/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B23:1/05	0	0
404	DEV001	CELL11_C	Discrete	1	FALSE	B20:10/07	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:21/02	0	0
404	DEV001	CELL12_C	Discrete	1	FALSE	B20:10/08	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/07	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/07	0	0
404	DEV001	ESTOP_BU	Discrete	1	FALSE	B23:1/15	0	0
404	DEV001	BLW1_OFI	Discrete	1	FALSE	B23:2/05	0	0
404	DEV001	BLW2_OFI	Discrete	1	FALSE	B23:2/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:18/05	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/04	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/03	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:18/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:21/05	0	0
404	DEV001	LAH_201	Discrete	1	FALSE	B23:5/09	0	0
404	DEV001	H2_DETEC	Discrete	1	FALSE	B20:1/01	0	0
404	DEV001	VFD2_FAU	Discrete	1	FALSE	B20:0/06	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/02	0	0
404	DEV001	RACK1_RE	Discrete	1	FALSE	B21:0/00	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B21:6/00	0	0
404	DEV001	VFD3_HAN	Discrete	1	FALSE	B21:6/01	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B21:6/02	0	0
404	DEV001	HPTK2_IN	Discrete	1	FALSE	B21:8/01	0	0
404	DEV001	RACK2_RE	Discrete	1	FALSE	B21:10/00	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/01	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/02	0	0
404	DEV001	LU_201	Discrete	1	FALSE	B23:5/05	0	0
404	DEV001	VFD1_FAU	Discrete	1	FALSE	B20:0/05	0	0
404	DEV001	PROC1_RI	Discrete	1	FALSE	B20:16/04	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:11/05	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/06	0	0

404	DEV001	PRE_RESI	Unsigned_	1	FALSE	N7:10	0	0
404	DEV001	RECT1_AI	Discrete	1	FALSE	B23:10/08	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:11	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/03	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/02	0	0
404	DEV001	RECT1_FA	Discrete	1	FALSE	B23:10/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/09	0	0
404	DEV001	ANY_ALAF	Discrete	1	FALSE	B20:9/00	0	0
404	DEV001	PRE_DOS	Discrete	1	FALSE	B23:3/03	0	0
404	DEV001	CP_100_E	Discrete	1	FALSE	B23:1/13	0	0
404	DEV001	CP_200_E	Discrete	1	FALSE	B23:1/14	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/11	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/12	0	0
404	DEV001	YA_700_AI	Discrete	1	FALSE	B23:4/00	0	0
404	DEV001	YA_710_AI	Discrete	1	FALSE	B23:4/02	0	0
404	DEV001	PRE_NO_I	Discrete	1	FALSE	B23:4/04	0	0
404	DEV001	FU_700_AI	Discrete	1	FALSE	B23:5/10	0	0
404	DEV001	AU_700	Discrete	1	FALSE	B23:5/11	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/01	0	0
404	DEV001	AAH_700	Discrete	1	FALSE	B23:5/13	0	0
404	DEV001	ANY_HYP(	Discrete	1	FALSE	B23:3/01	0	0
404	DEV001	POST_DO	Discrete	1	FALSE	B23:3/04	0	0
404	DEV001	YA_800_AI	Discrete	1	FALSE	B23:4/10	0	0
404	DEV001	YA_810_AI	Discrete	1	FALSE	B23:4/12	0	0
404	DEV001	POST_NO_	Discrete	1	FALSE	B23:4/14	0	0
404	DEV001	FU_800_AI	Discrete	1	FALSE	B23:6/10	0	0
404	DEV001	AU_800	Discrete	1	FALSE	B23:6/11	0	0
404	DEV001	AAL_800	Discrete	1	FALSE	B23:6/12	0	0
404	DEV001	AAH_800	Discrete	1	FALSE	B23:6/13	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:16/05	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/06	0	0
404	DEV001	AAL_700	Discrete	1	FALSE	B23:5/12	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:46	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:18	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:19	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:20	0	0
404	DEV001	CELL 2 FL	Floating_P	1	FALSE	F31:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:40	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:45	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:13	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:51	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F52:3	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:56	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:2	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:3	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:4	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:12	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:13	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F51:2	0	0

404	DEV001	MP_810_S	Unsigned_	1	FALSE	N24:15	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:10	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:14	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:13	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:4	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:3	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:25	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:22	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:23	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:15	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:28	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:14	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F35:6	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F52:2	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F35:16	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:29	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:12	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:45	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:24	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:89	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:14	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:55	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:60	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:10	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:20	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:16	0	0
404	DEV001	H2_HD100	Floating_P	1	FALSE	F30:70	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:52	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:43	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:39	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:88	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:38	0	0
404	DEV001	NH3_PMP	Floating_P	1	FALSE	F35:100	0	0
404	DEV001	NH3_PMP2	Floating_P	1	FALSE	F35:110	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:23	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:22	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:24	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:57	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:85	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:82	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:80	0	0
404	DEV001	BRTK_SAL	Floating_P	1	FALSE	F30:100	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:22	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:29	0	0
404	DEV001	GAIN 1	Floating_P	1	FALSE	F35:47	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:49	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:53	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:55	0	0
404	DEV001	GAIN 2	Floating_P	1	FALSE	F35:57	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:59	0	0
404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F35:26	0	0

404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F53:2	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:70	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:43	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:71	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:67	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:24	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:23	0	0
404	DEV001	GAIN 3	Floating_P	1	FALSE	F35:67	0	0
404	DEV001	LOW LIMI	Floating_P	1	FALSE	F35:69	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:65	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:63	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:28	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:29	0	0
404	DEV001	DOSING F	Floating_P	1	FALSE	F51:3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:4	0	0
404	DEV001	MP_710_S	Unsigned_	1	FALSE	N7:28	0	0
404	DEV001	MP_810_S	Unsigned_	1	FALSE	N7:58	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N7:57	0	0
404	DEV001	MP_800_H	Unsigned_	1	FALSE	N7:55	0	0
404	DEV001	MP_810_H	Unsigned_	1	FALSE	N7:56	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:40	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:41	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:1	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:3	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:44	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:5	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:6	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:7	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.1	0	0
404	DEV001	PLC_TO_F	Unsigned_	1	FALSE	N9:0	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T41:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:18.PR	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:2	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:14	0	0
404	DEV001	BLW_ROT	Unsigned_	1	FALSE	N24:100	0	0
404	DEV001	BLW_600_	Unsigned_	1	FALSE	N24:10	0	0
404	DEV001	BLW_610_	Unsigned_	1	FALSE	N24:11	0	0
404	DEV001	DI_0_16	Discrete	1	FALSE	I:0/16	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N7:11	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N24:20	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N24:21	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N7:41	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:40	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:61	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:13	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:46	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:16	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:12	0	0
404	DEV001	PRE_RES_	Unsigned_	1	FALSE	N7:31	0	0
404	DEV001	MP_700_S	Unsigned_	1	FALSE	N7:27	0	0
404	DEV001	MP_700_H	Unsigned_	1	FALSE	N7:25	0	0

404	DEV001	MP_710_H	Unsigned_	1	FALSE	N7:26	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:45	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:42	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:43	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:79	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:15	0	0
404	DEV001	QR_710	Floating_P	1	FALSE	F30:3	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N24:14	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:58	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:59	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:60	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:68	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:69	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:102	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:105	0	0
404	DEV001	BLW1_QR	Floating_P	1	FALSE	F30:0	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:49	0	0
404	DEV001	QR_700	Floating_P	1	FALSE	F30:2	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:48	0	0
404	DEV001	QR_800	Floating_P	1	FALSE	F30:4	0	0
404	DEV001	QR_810	Floating_P	1	FALSE	F30:5	0	0
404	DEV001	AAL_700_S	Floating_P	1	FALSE	F30:41	0	0
404	DEV001	AAH_700_	Floating_P	1	FALSE	F30:42	0	0
404	DEV001	PRE_MP_(	Floating_P	1	FALSE	F51:9	0	0
404	DEV001	PRE_MP_S	Floating_P	1	FALSE	F51:10	0	0
404	DEV001	PRE_FP_C	Floating_P	1	FALSE	F51:14	0	0
404	DEV001	AAH_800_	Floating_P	1	FALSE	F30:62	0	0
404	DEV001	AAL_800_S	Floating_P	1	FALSE	F30:61	0	0
404	DEV001	POST_FP_	Floating_P	1	FALSE	F51:34	0	0
404	DEV001	BLW2_QR	Floating_P	1	FALSE	F30:1	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:139	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:51	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:110	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:118	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:119	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:108	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:109	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:120	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:130	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:128	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:50	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:129	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:78	0	0
404	DEV001	ECR_100_	Floating_P	1	FALSE	F30:6	0	0
404	DEV001	RECT2_VC	Floating_P	1	FALSE	F32:0	0	0
404	DEV001	RECT2_AM	Floating_P	1	FALSE	F32:10	0	0
404	DEV001	ECR_200_	Floating_P	1	FALSE	F30:7	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:30	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:83	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:84	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:38	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:39	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:40	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:138	0	0

Block: OB_1
Author:
Created: 04/19/2001 11:21:55 am
Last Modified: 06/06/2007 10:49:23 am

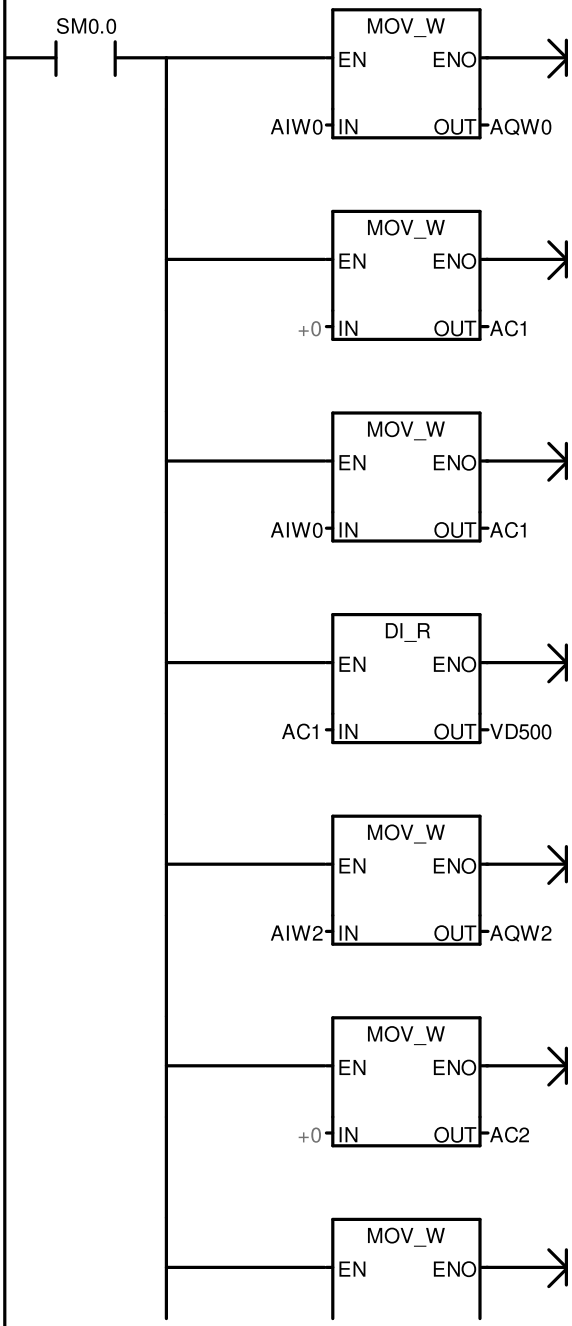
Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

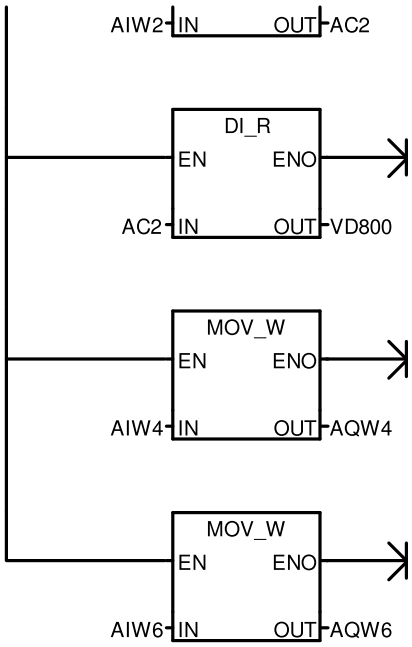
PROGRAM COMMENTS
Press F1 for help and example program

PROGRAM COMMENTS
Press F1 for help and example program

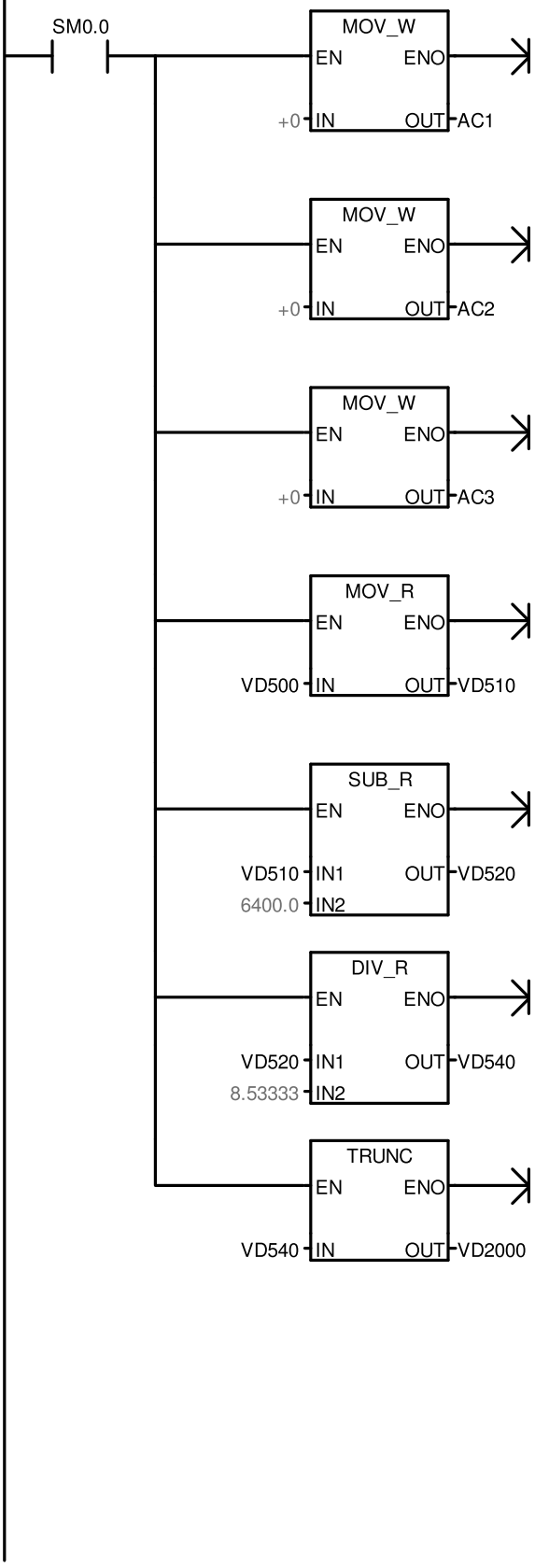
Network 1 NETWORK TITLE (single line)

NETWORK COMMENTS

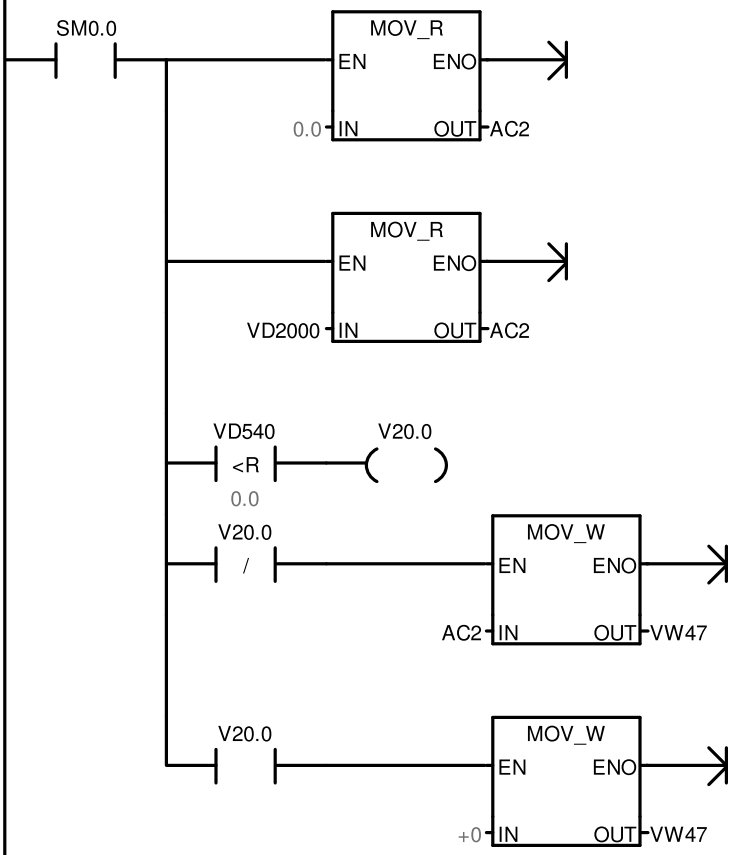



AIW2
IN
OUT
AC2
DI_R
EN
ENO
AC2
IN
OUT
VD800
MOV_W
EN
ENO
AIW4
IN
OUT
AQW4
MOV_W
EN
ENO
AIW6
IN
OUT
AQW6

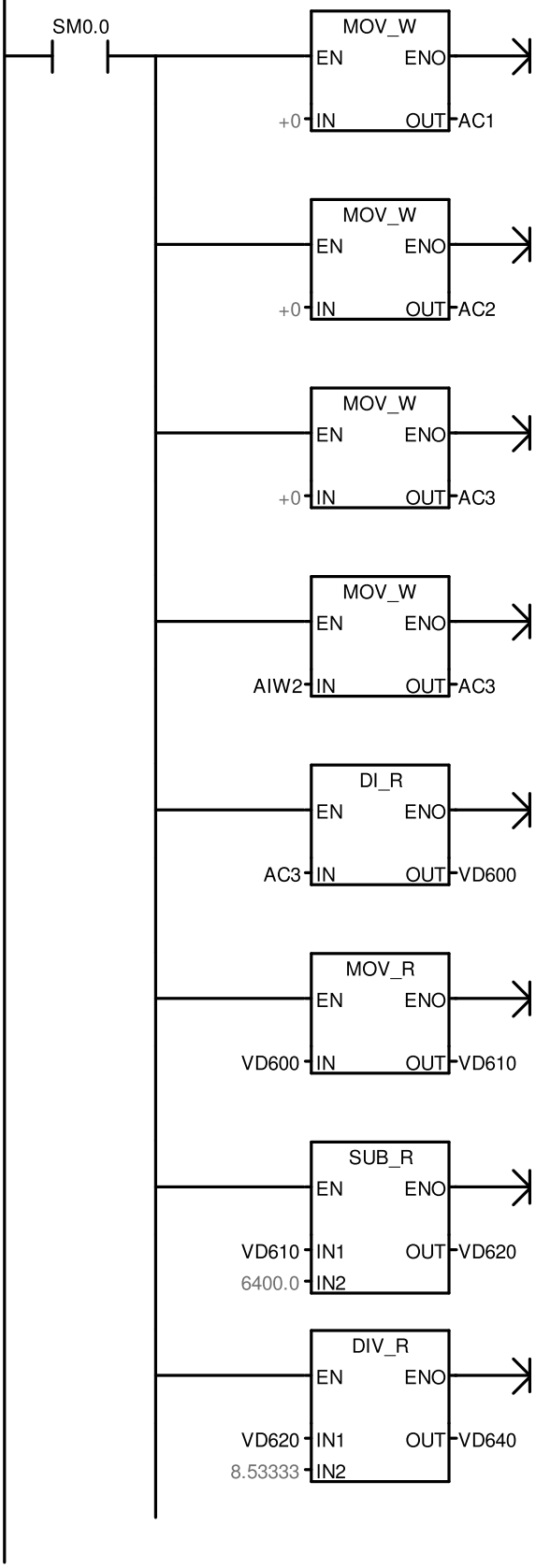
Network 2

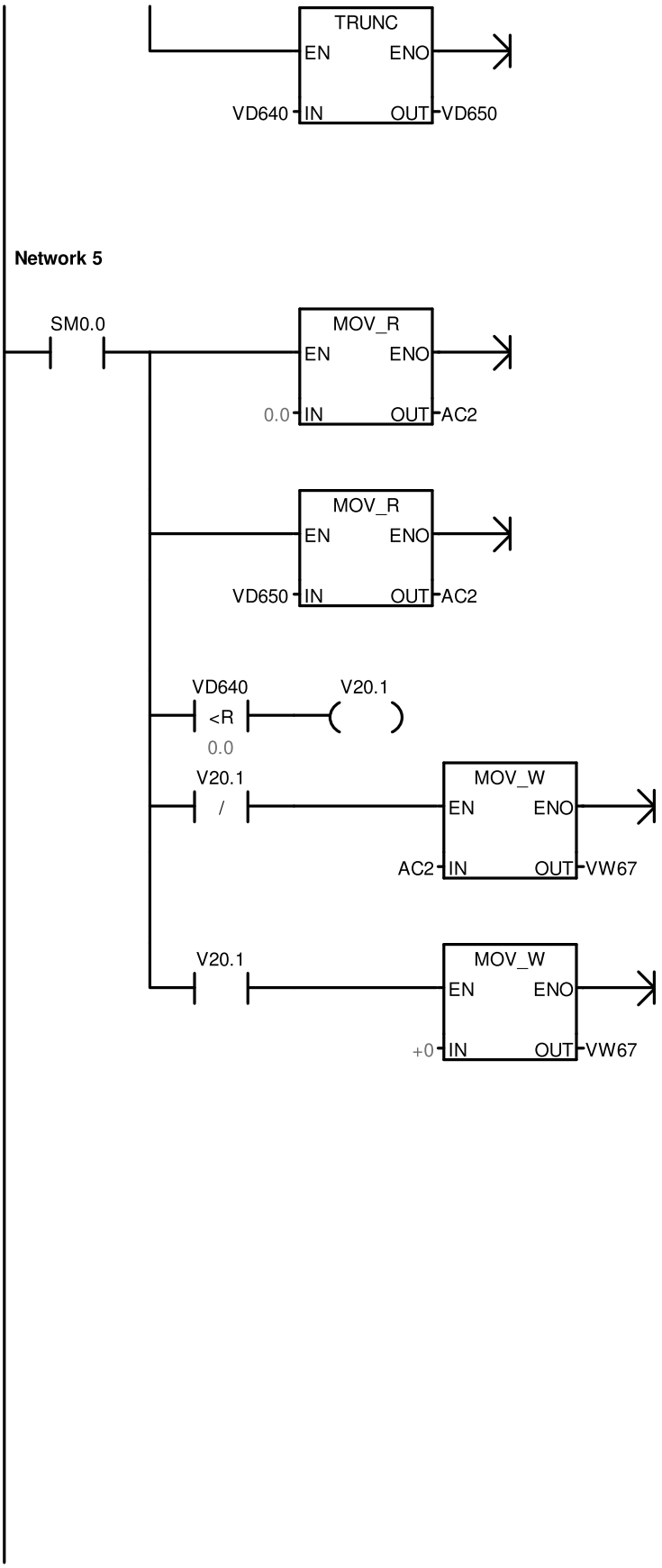

SM0.0
MOV_W
EN
ENO
+0
IN
OUT
AC1
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_W
EN
ENO
+0
IN
OUT
AC3
MOV_R
EN
ENO
VD500
IN
OUT
VD510
SUB_R
EN
ENO
VD510
IN1
OUT
VD520
6400.0
IN2
DIV_R
EN
ENO
VD520
IN1
OUT
VD540
8.53333
IN2
TRUNC
EN
ENO
VD540
IN
OUT
VD2000

Network 3

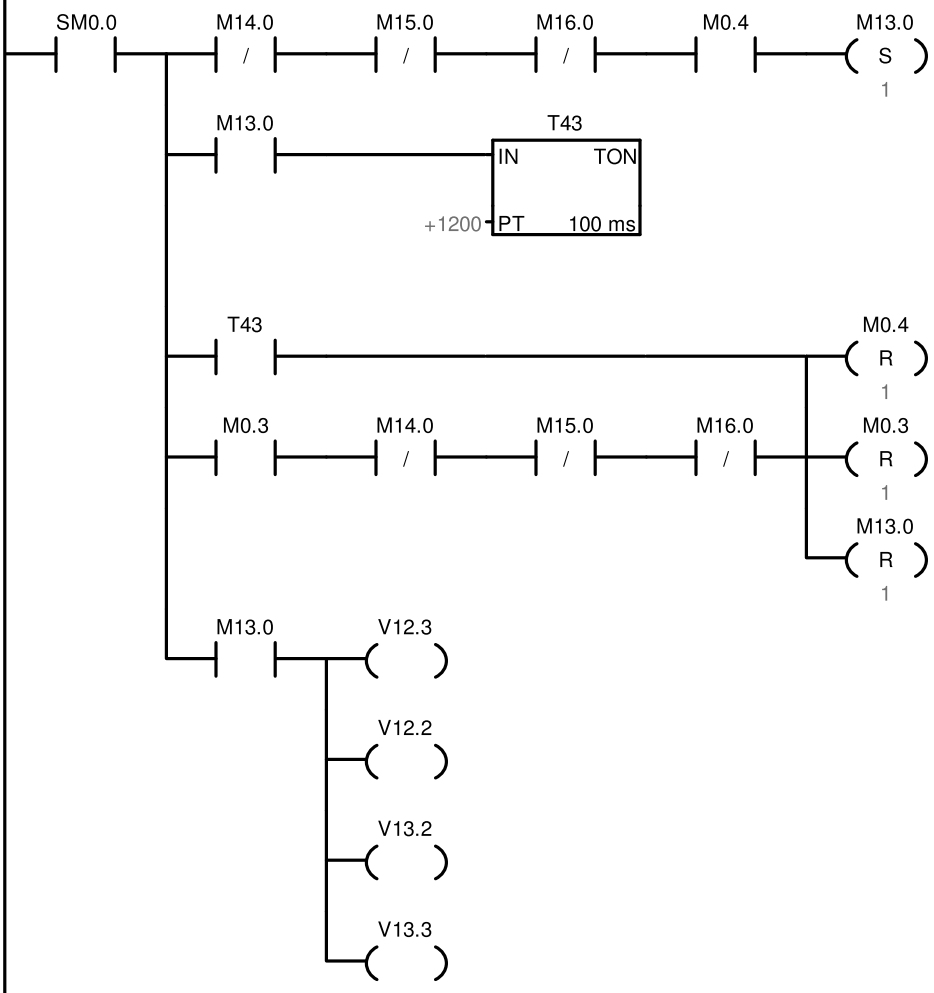

SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_R
EN
ENO
VD2000
IN
OUT
AC2
VD540
<R
0.0
V20.0
V20.0
/
MOV_W
EN
ENO
AC2
IN
OUT
VW47
V20.0
MOV_W
EN
ENO
+0
IN
OUT
VW47

Network 4

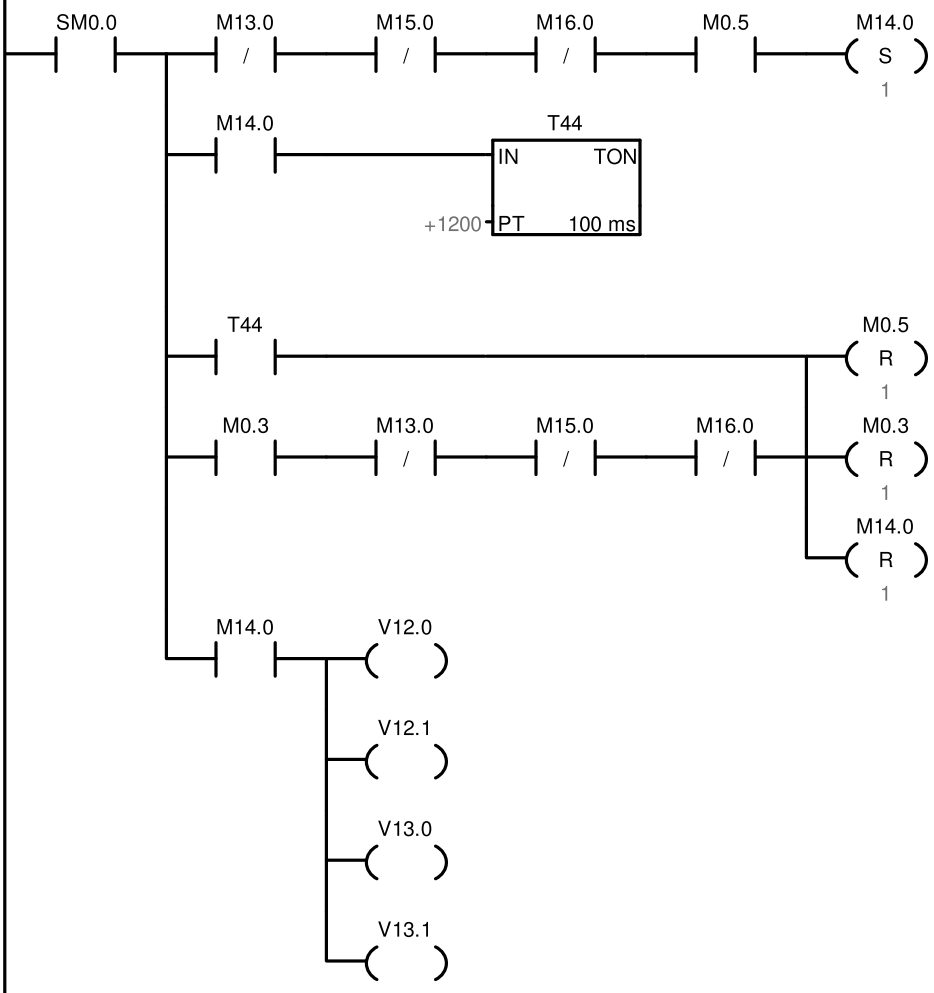

SM0.0
MOV_W
EN
ENO
+0
IN
OUT
AC1
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_W
EN
ENO
+0
IN
OUT
AC3
MOV_W
EN
ENO
AIW2
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD600
MOV_R
EN
ENO
VD600
IN
OUT
VD610
SUB_R
EN
ENO
VD610
IN1
OUT
VD620
6400.0
IN2
DIV_R
EN
ENO
VD620
IN1
OUT
VD640
8.53333
IN2


TRUNC
EN
ENO
VD640
IN
OUT
VD650
Network 5
SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_R
EN
ENO
VD650
IN
OUT
AC2
VD640
<R
0.0
V20.1
V20.1
/
MOV_W
EN
ENO
AC2
IN
OUT
VW67
V20.1
MOV_W
EN
ENO
+0
IN
OUT
VW67

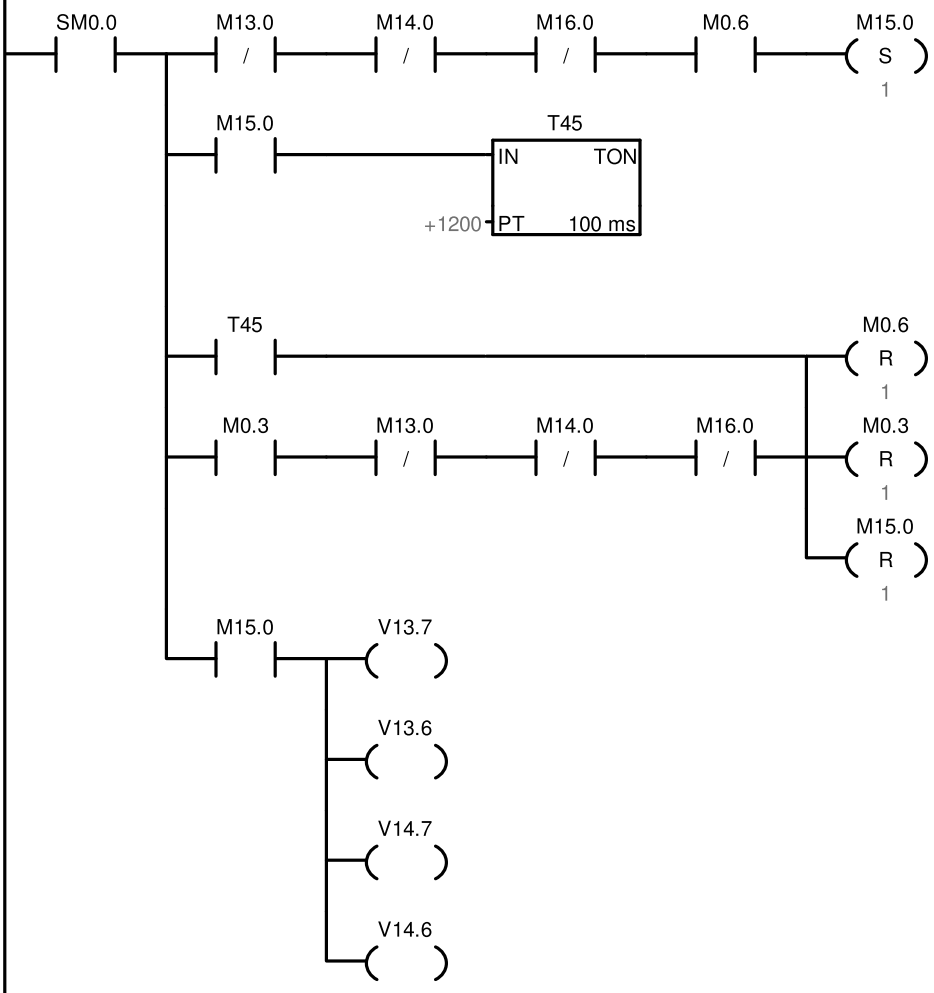
Network 6


SM0.0
M14.0
/
M15.0
/
M16.0
/
M0.4
M13.0
S
1
M13.0
T43
IN
TON
+1200
PT
100 ms
T43
M0.4
R
1
M0.3
M14.0
/
M15.0
/
M16.0
/
M0.3
R
1
M13.0
R
1
M13.0
V12.3
V12.2
V13.2
V13.3

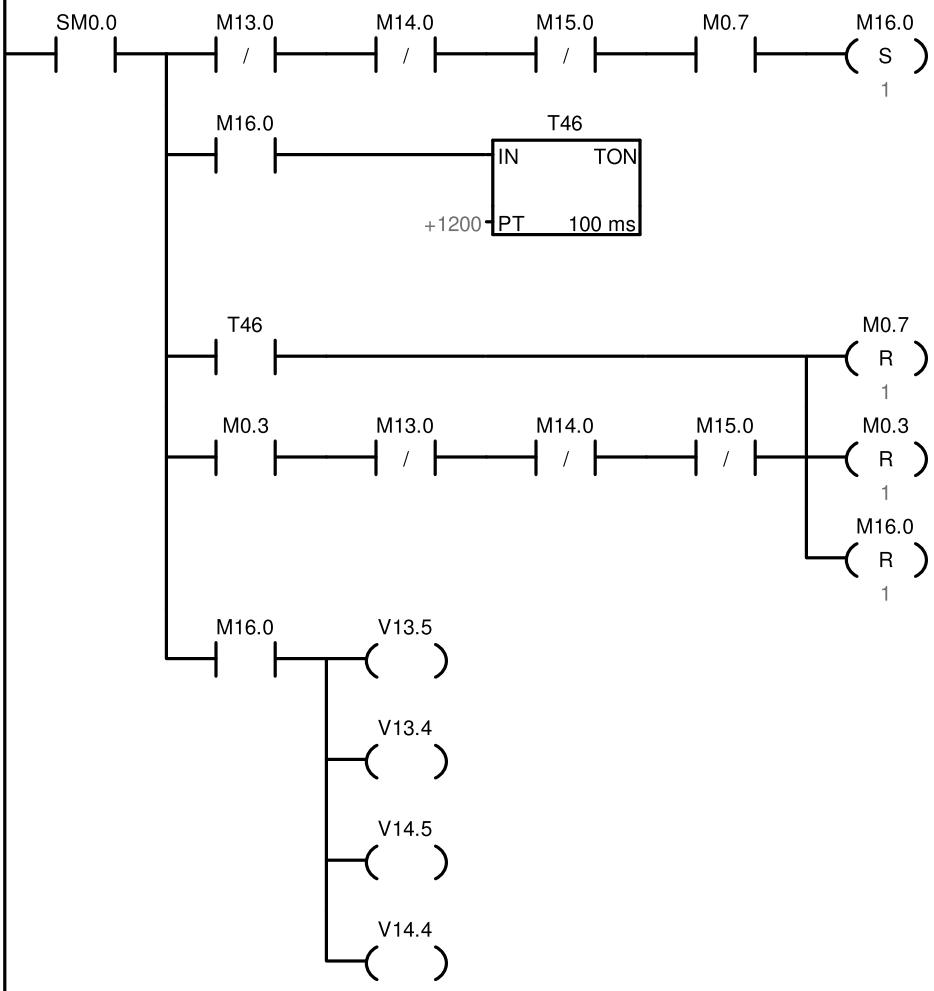
Network 7


SM0.0
M13.0
/
M15.0
/
M16.0
/
M0.5
M14.0
S
1
M14.0
T44
IN
TON
+1200
PT
100 ms
T44
M0.5
R
1
M0.3
M13.0
/
M15.0
/
M16.0
/
M0.3
R
1
M14.0
R
1
M14.0
V12.0
V12.1
V13.0
V13.1

Network 8

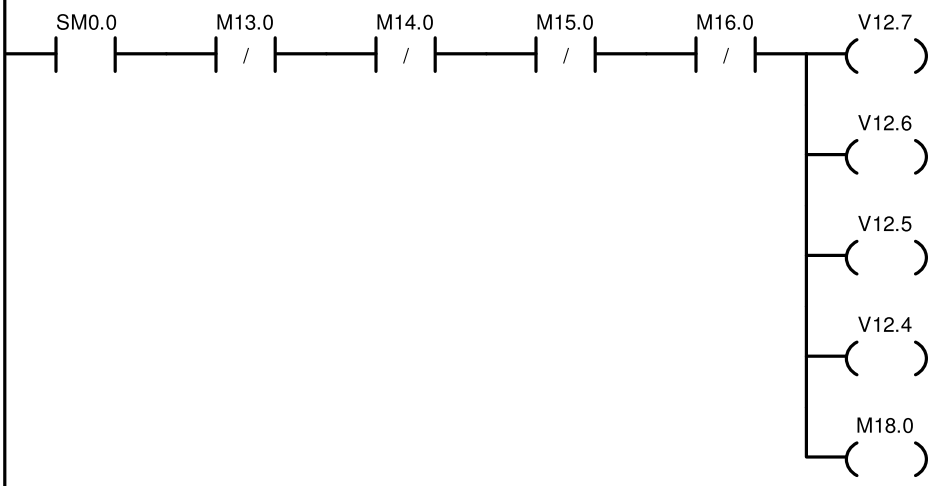

SM0.0
M13.0
/
M14.0
/
M16.0
/
M0.6
M15.0
S
1
M15.0
T45
IN
TON
+1200
PT
100 ms
T45
M0.6
R
1
M0.3
M13.0
/
M14.0
/
M16.0
/
M0.3
R
1
M15.0
R
1
M15.0
V13.7
V13.6
V14.7
V14.6

Network 9

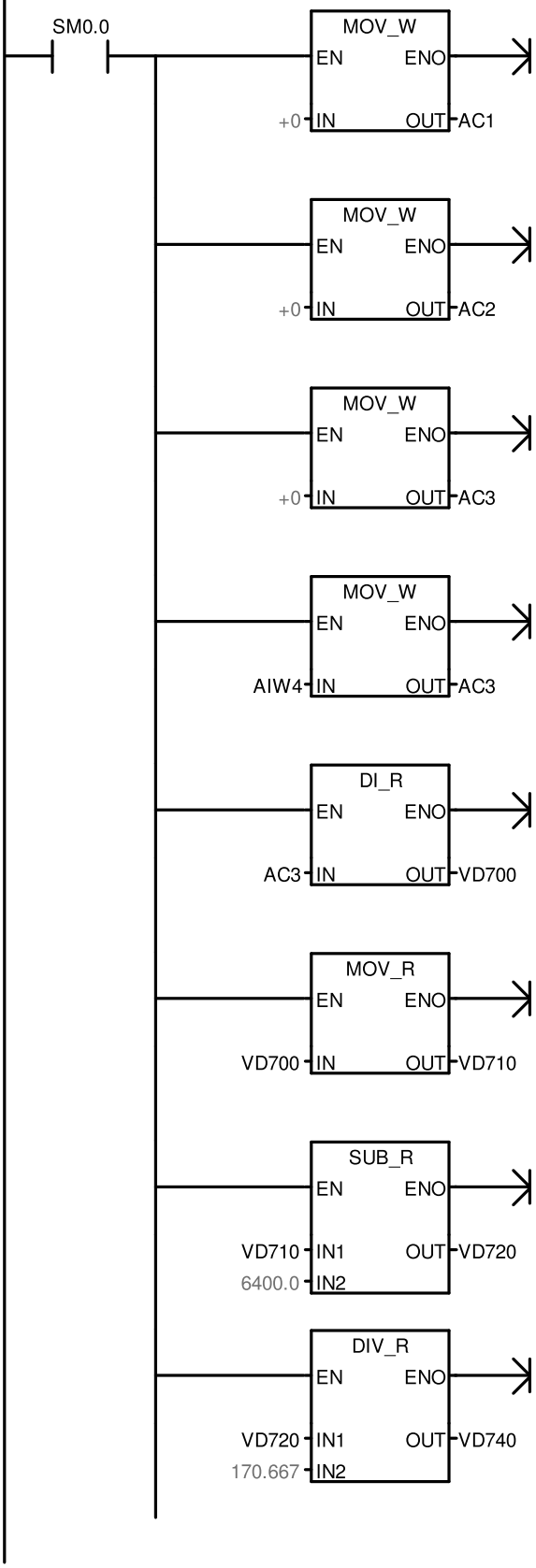


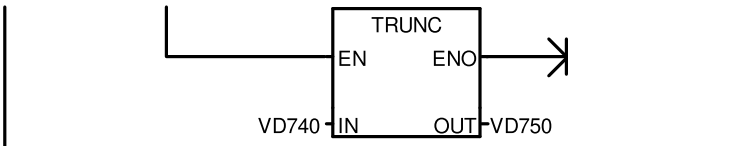
Network 10

Network 11

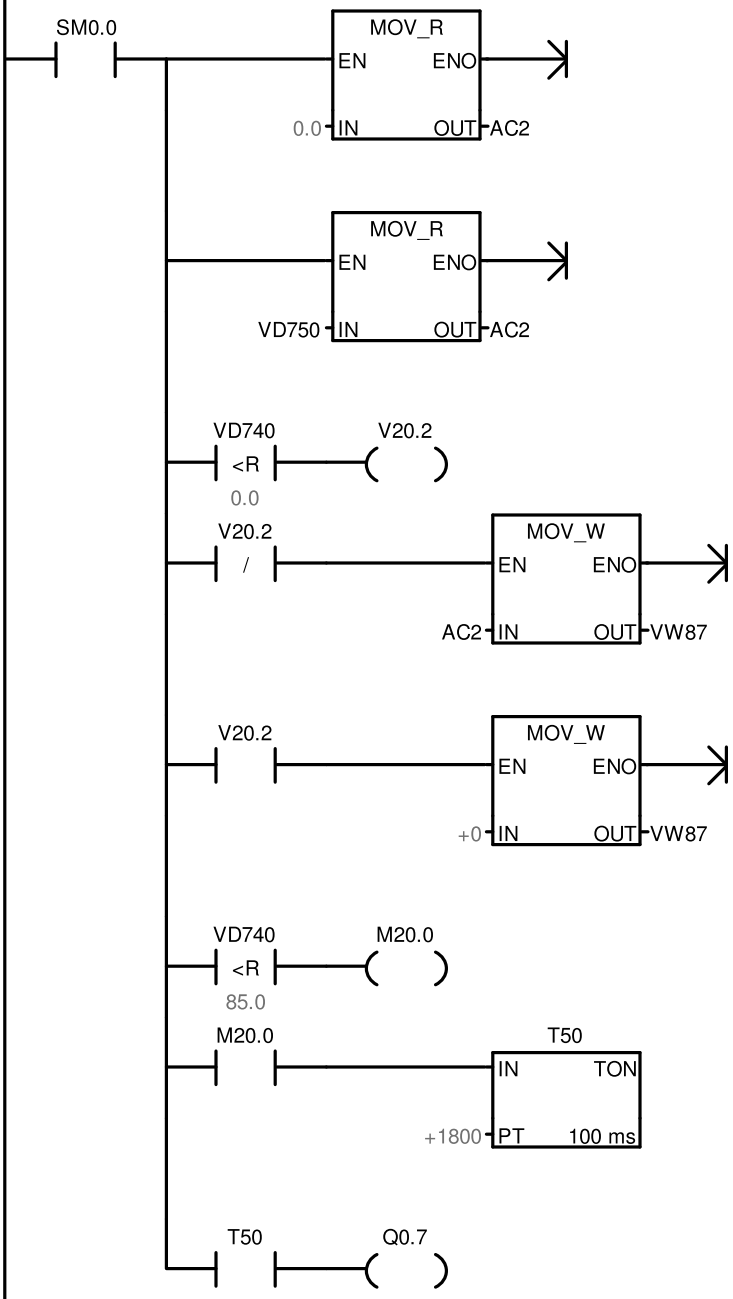


Network 12

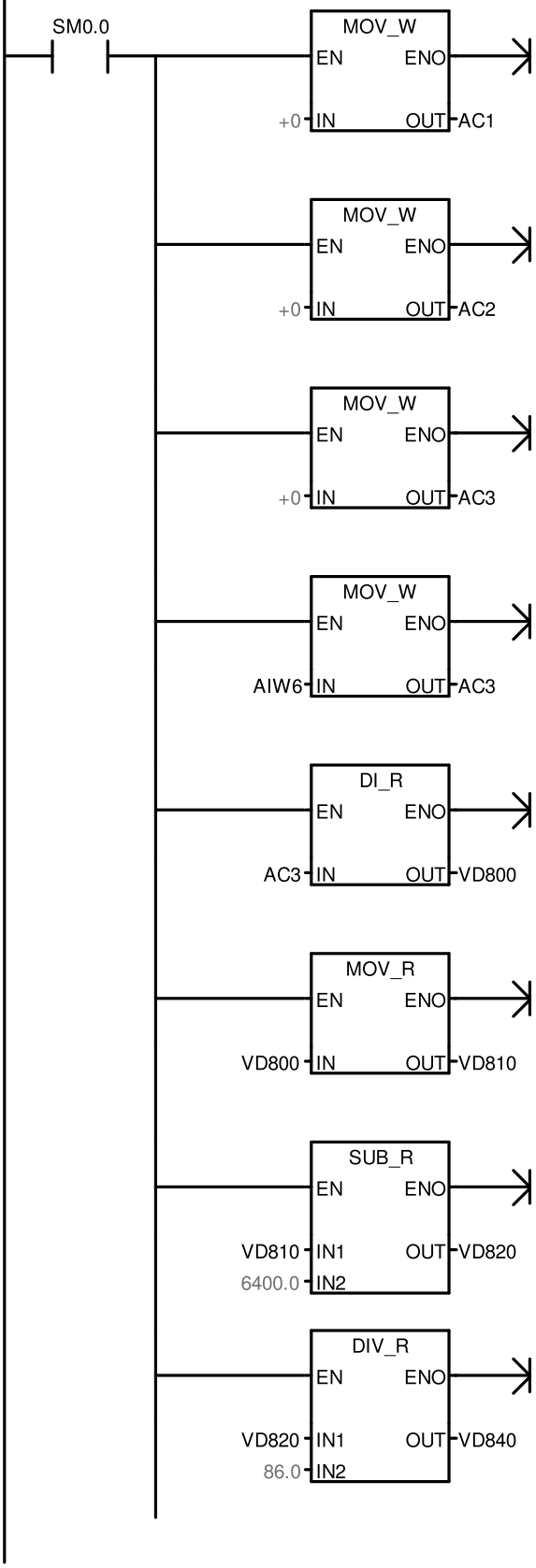

SM0.0
MOV_W
EN
ENO
+0
IN
OUT
AC1
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_W
EN
ENO
+0
IN
OUT
AC3
MOV_W
EN
ENO
AIW4
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD700
MOV_R
EN
ENO
VD700
IN
OUT
VD710
SUB_R
EN
ENO
VD710
IN1
OUT
VD720
6400.0
IN2
DIV_R
EN
ENO
VD720
IN1
OUT
VD740
170.667
IN2

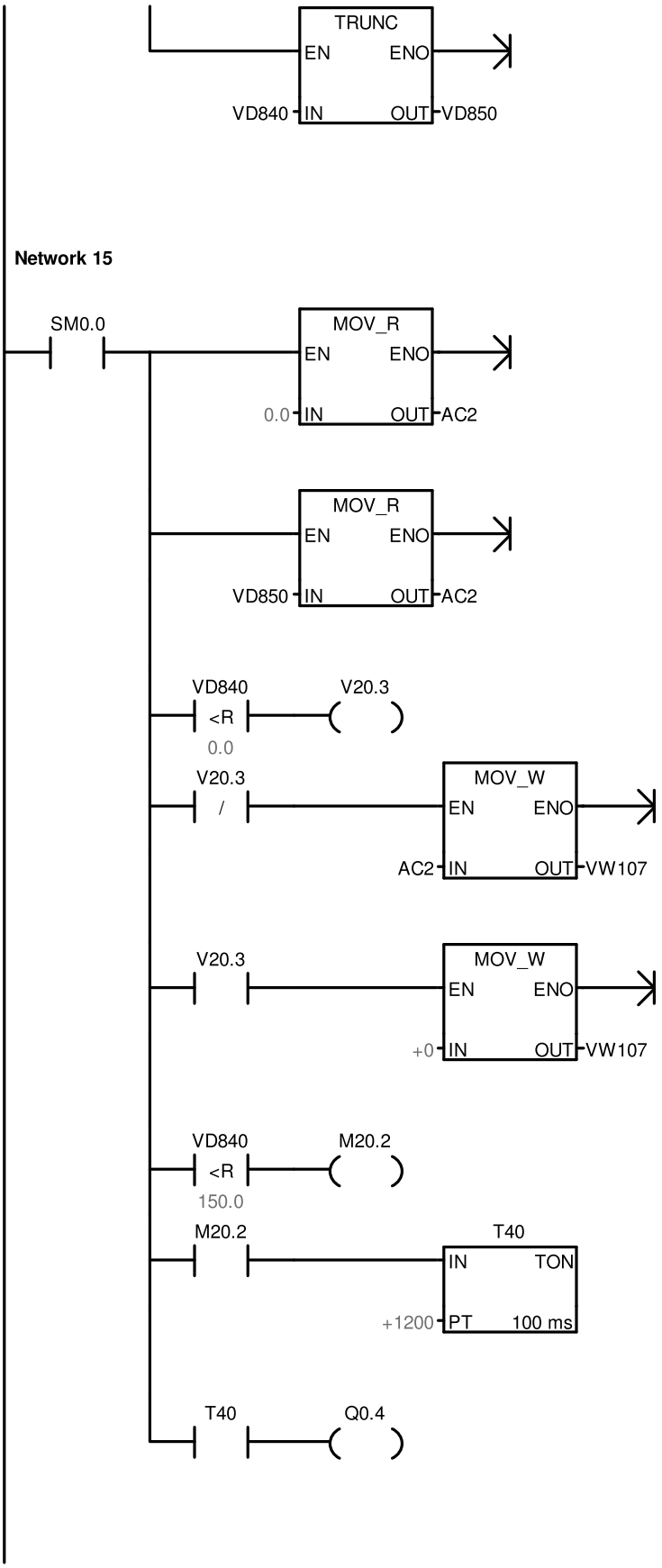

TRUNC
EN
ENO
VD740
IN
OUT
VD750

Network 13

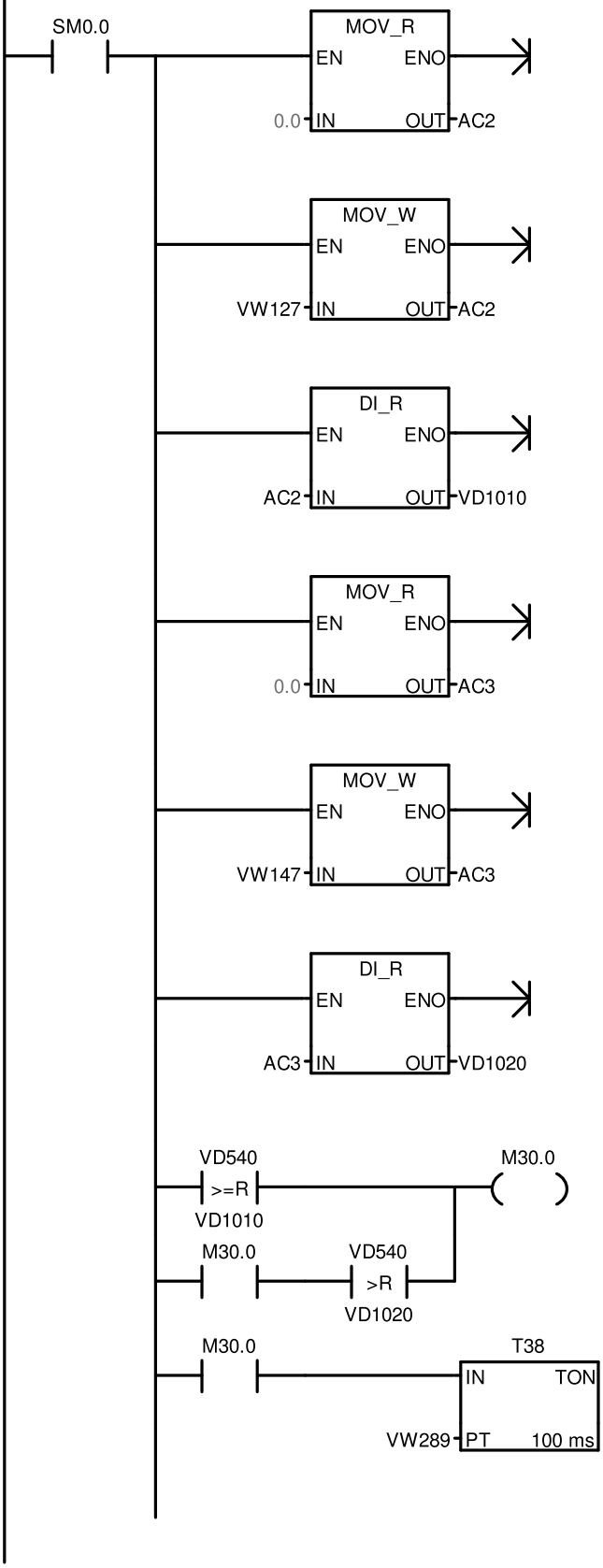

SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_R
EN
ENO
VD750
IN
OUT
AC2
VD740
<R
0.0
V20.2
V20.2
/
MOV_W
EN
ENO
AC2
IN
OUT
VW87
V20.2
MOV_W
EN
ENO
+0
IN
OUT
VW87
VD740
<R
85.0
M20.0
M20.0
T50
IN
TON
+1800
PT
100 ms
T50
Q0.7

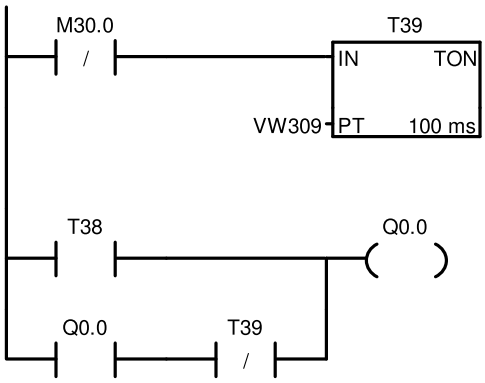
Network 14


SM0.0
MOV_W
EN
ENO
+0
IN
OUT
AC1
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_W
EN
ENO
+0
IN
OUT
AC3
MOV_W
EN
ENO
AIW6
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD800
MOV_R
EN
ENO
VD800
IN
OUT
VD810
SUB_R
EN
ENO
VD810
IN1
OUT
VD820
6400.0
IN2
DIV_R
EN
ENO
VD820
IN1
OUT
VD840
86.0
IN2

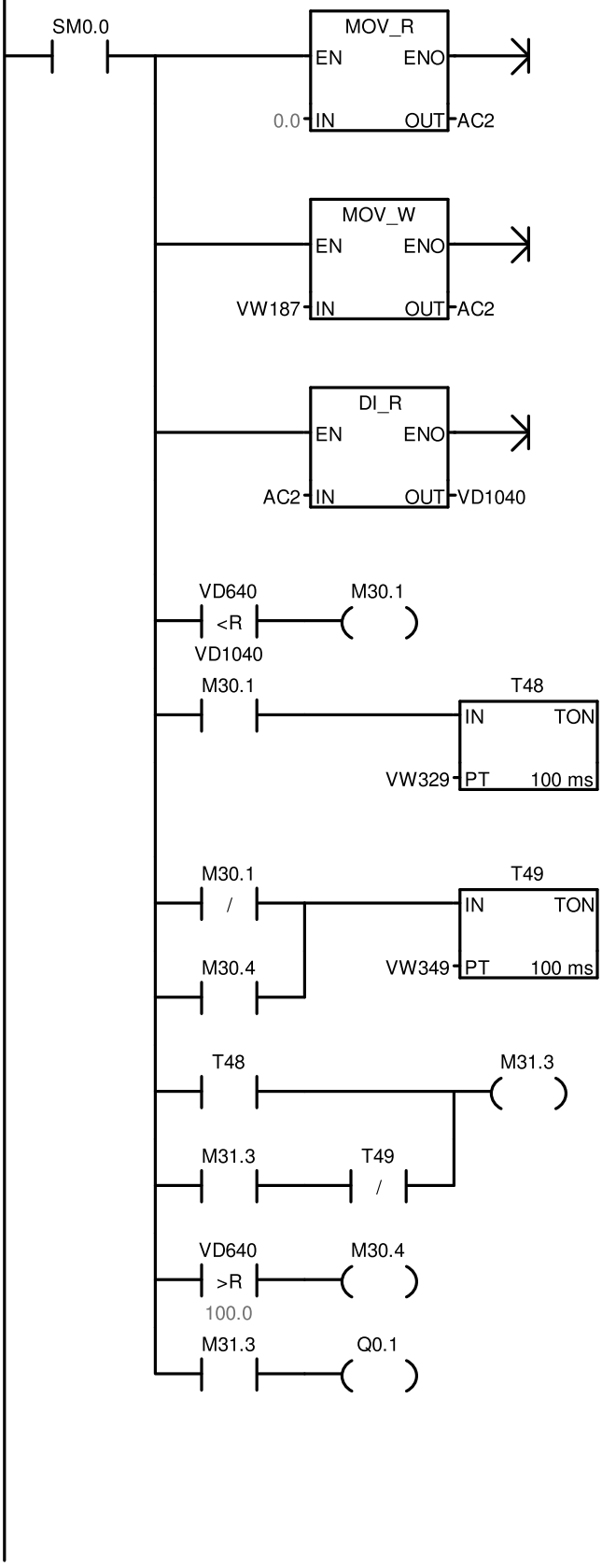

TRUNC
EN
ENO
VD840
IN
OUT
VD850
Network 15
SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_R
EN
ENO
VD850
IN
OUT
AC2
VD840
<R
0.0
V20.3
V20.3
/
MOV_W
EN
ENO
AC2
IN
OUT
VW107
V20.3
MOV_W
EN
ENO
+0
IN
OUT
VW107
VD840
<R
150.0
M20.2
M20.2
T40
IN
TON
+1200
PT
100 ms
T40
Q0.4

Network 16

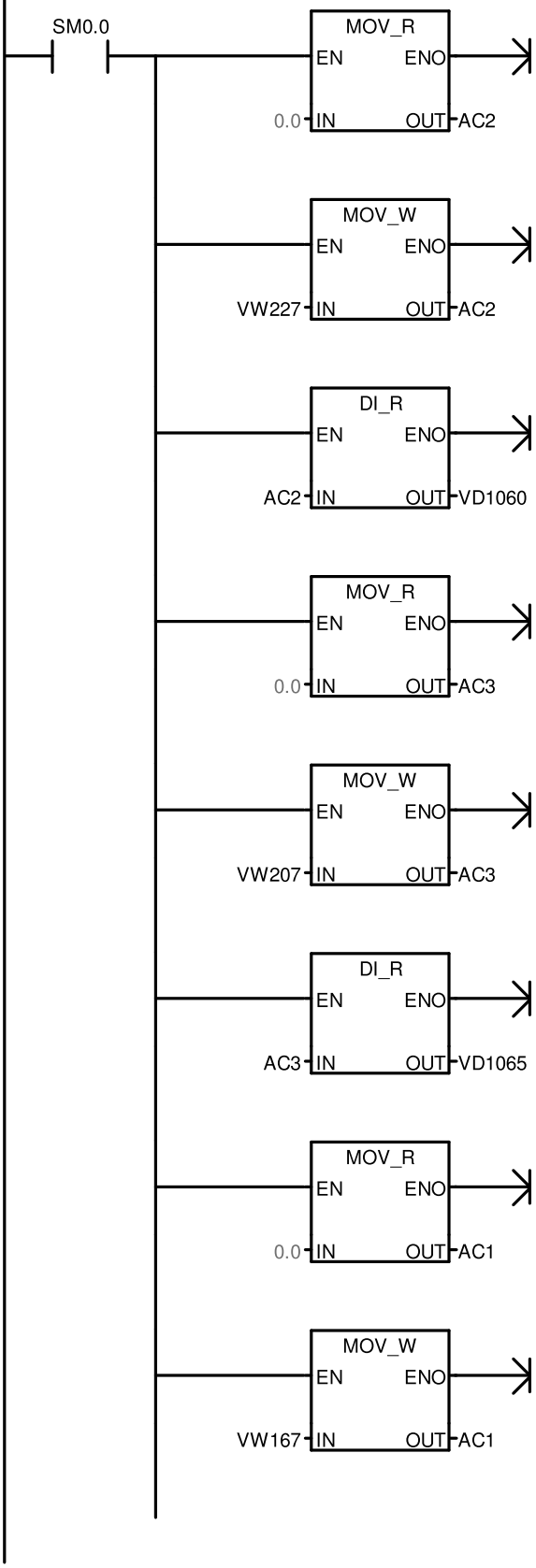

SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_W
EN
ENO
VW127
IN
OUT
AC2
DI_R
EN
ENO
AC2
IN
OUT
VD1010
MOV_R
EN
ENO
0.0
IN
OUT
AC3
MOV_W
EN
ENO
VW147
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD1020
VD540
>=R
VD1010
M30.0
M30.0
VD540
>R
VD1020
M30.0
T38
IN
TON
VW289
PT
100 ms

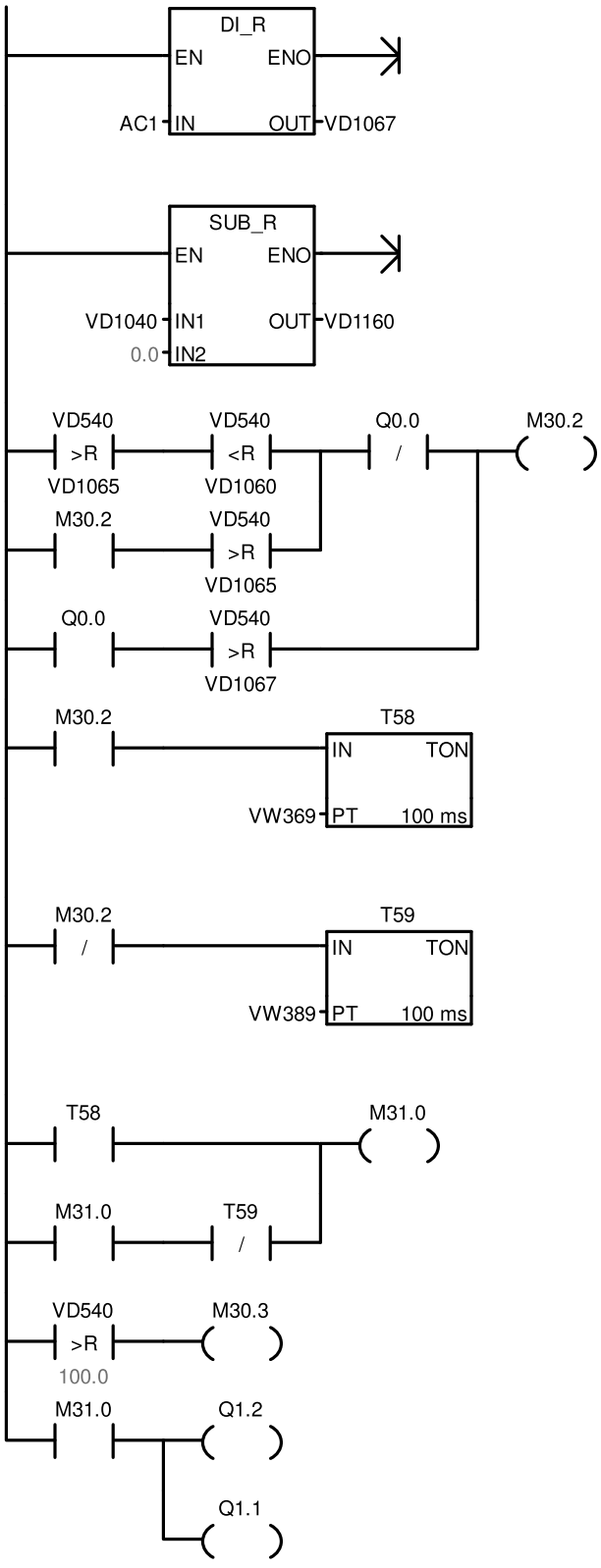

M30.0
/
T39
IN
TON
VW309
PT
100 ms
T38
Q0.0
Q0.0
T39
/

Network 17

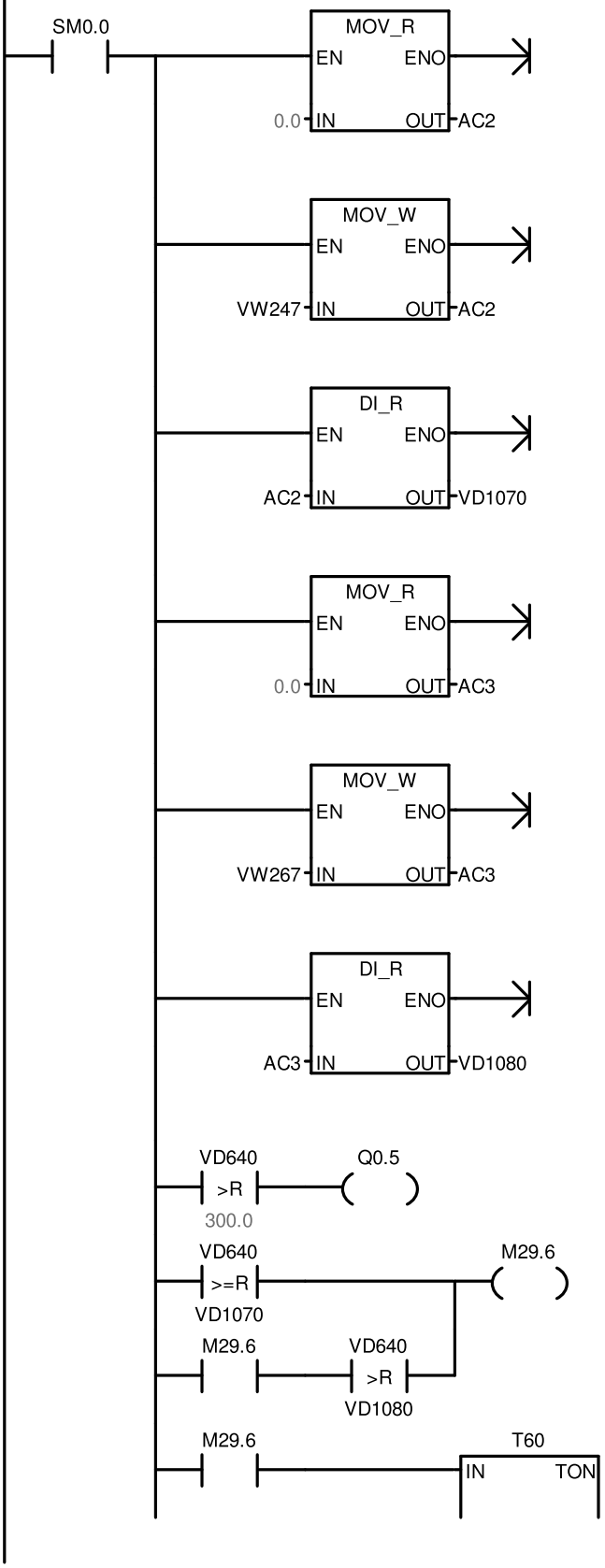

SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_W
EN
ENO
VW187
IN
OUT
AC2
DI_R
EN
ENO
AC2
IN
OUT
VD1040
VD640
<R
VD1040
M30.1
M30.1
T48
IN
TON
VW329
PT
100 ms
M30.1
/
M30.4
T49
IN
TON
VW349
PT
100 ms
T48
M31.3
M31.3
T49
/
VD640
>R
100.0
M30.4
M31.3
Q0.1

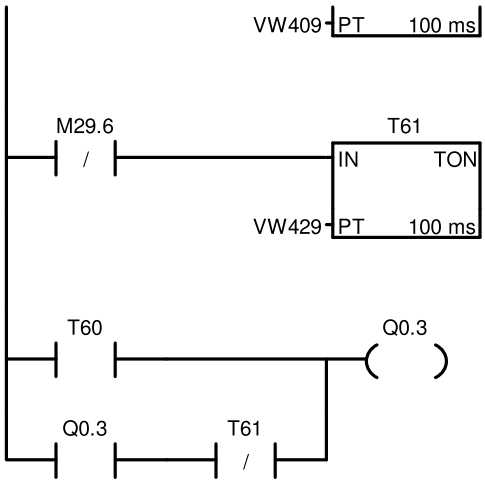
Network 18


SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_W
EN
ENO
VW227
IN
OUT
AC2
DI_R
EN
ENO
AC2
IN
OUT
VD1060
MOV_R
EN
ENO
0.0
IN
OUT
AC3
MOV_W
EN
ENO
VW207
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD1065
MOV_R
EN
ENO
0.0
IN
OUT
AC1
MOV_W
EN
ENO
VW167
IN
OUT
AC1


DI_R
EN
ENO
AC1
IN
OUT
VD1067
SUB_R
EN
ENO
VD1040
IN1
OUT
VD1160
0.0
IN2
VD540
>R
VD1065
VD540
<R
VD1060
Q0.0
/
M30.2
M30.2
VD540
>R
VD1065
Q0.0
VD540
>R
VD1067
M30.2
T58
IN
TON
VW369
PT
100 ms
M30.2
/
T59
IN
TON
VW389
PT
100 ms
T58
M31.0
M31.0
T59
/
VD540
>R
100.0
M30.3
M31.0
Q1.2
Q1.1

Network 19


SM0.0
MOV_R
EN
ENO
0.0
IN
OUT
AC2
MOV_W
EN
ENO
VW247
IN
OUT
AC2
DI_R
EN
ENO
AC2
IN
OUT
VD1070
MOV_R
EN
ENO
0.0
IN
OUT
AC3
MOV_W
EN
ENO
VW267
IN
OUT
AC3
DI_R
EN
ENO
AC3
IN
OUT
VD1080
VD640
>R
300.0
Q0.5
VD640
>=R
VD1070
M29.6
M29.6
VD640
>R
VD1080
M29.6
T60
IN
TON


VW409
PT
100 ms
M29.6
/
T61
IN
TON
VW429
PT
100 ms
T60
Q0.3
Q0.3
T61
/

Block: SBR_0
Author:
Created: 06/20/2018 10:04:56 am
Last Modified: 06/20/2018 10:04:56 am

Symbol	Var Type	Data Type	Comment
EN	IN	BOOL	
	IN		
	IN_OUT		
	OUT		
	TEMP		

SUBROUTINE COMMENTS
Press F1 for help and example program

SUBROUTINE COMMENTS
Press F1 for help and example program

Network 1 NETWORK TITLE (single line)

NETWORK COMMENTS

Block: INT_0
Author:
Created: 06/20/2018 10:04:56 am
Last Modified: 06/20/2018 10:04:56 am

Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

INTERRUPT ROUTINE COMMENTS
Press F1 for help and example program

INTERRUPT ROUTINE COMMENTS
Press F1 for help and example program

Network 1 NETWORK TITLE (single line)

NETWORK COMMENTS

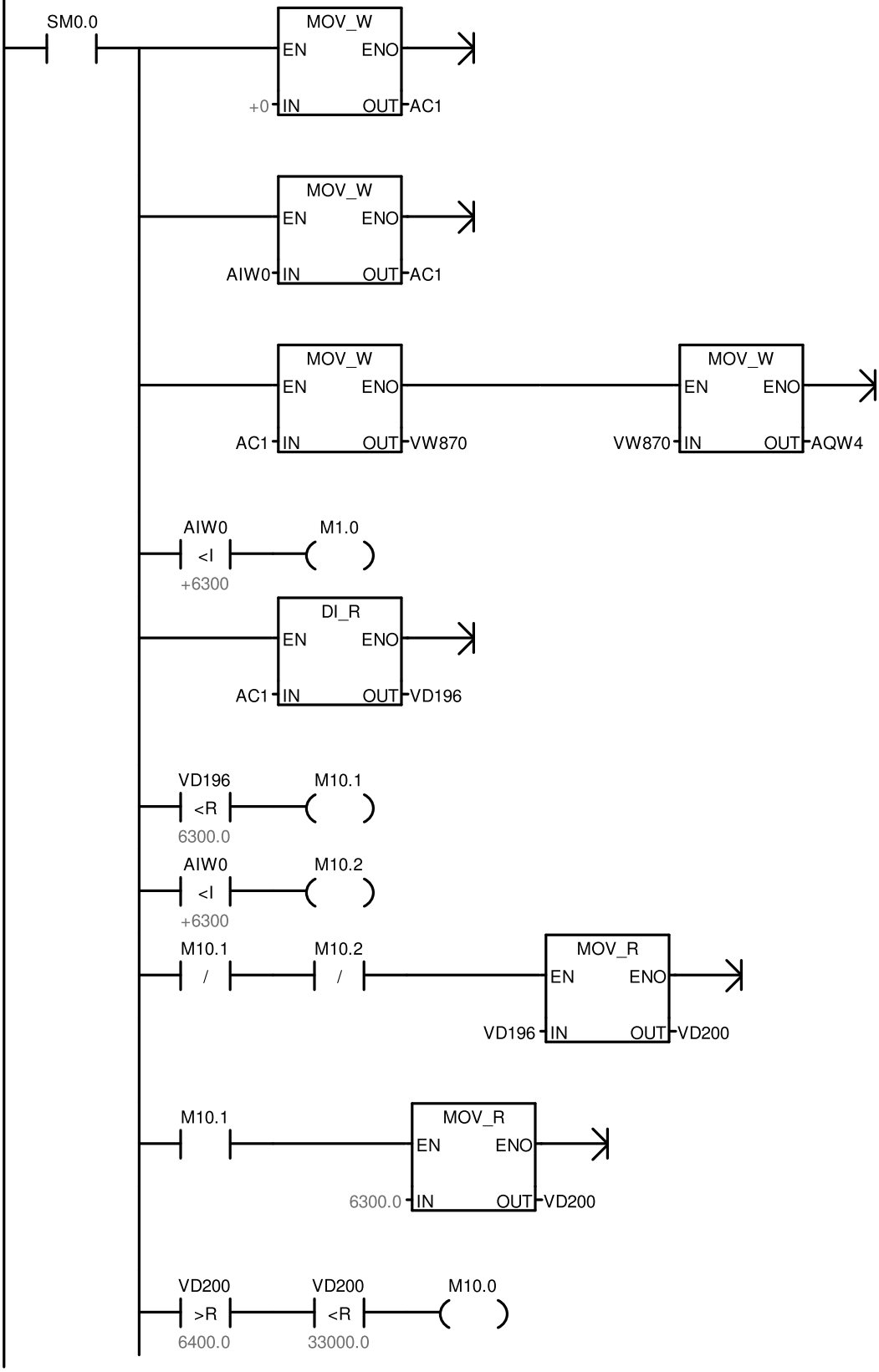
Block: MAIN
Author:
Created: 09/27/2010 10:58:07 am
Last Modified: 08/18/2015 10:29:52 am

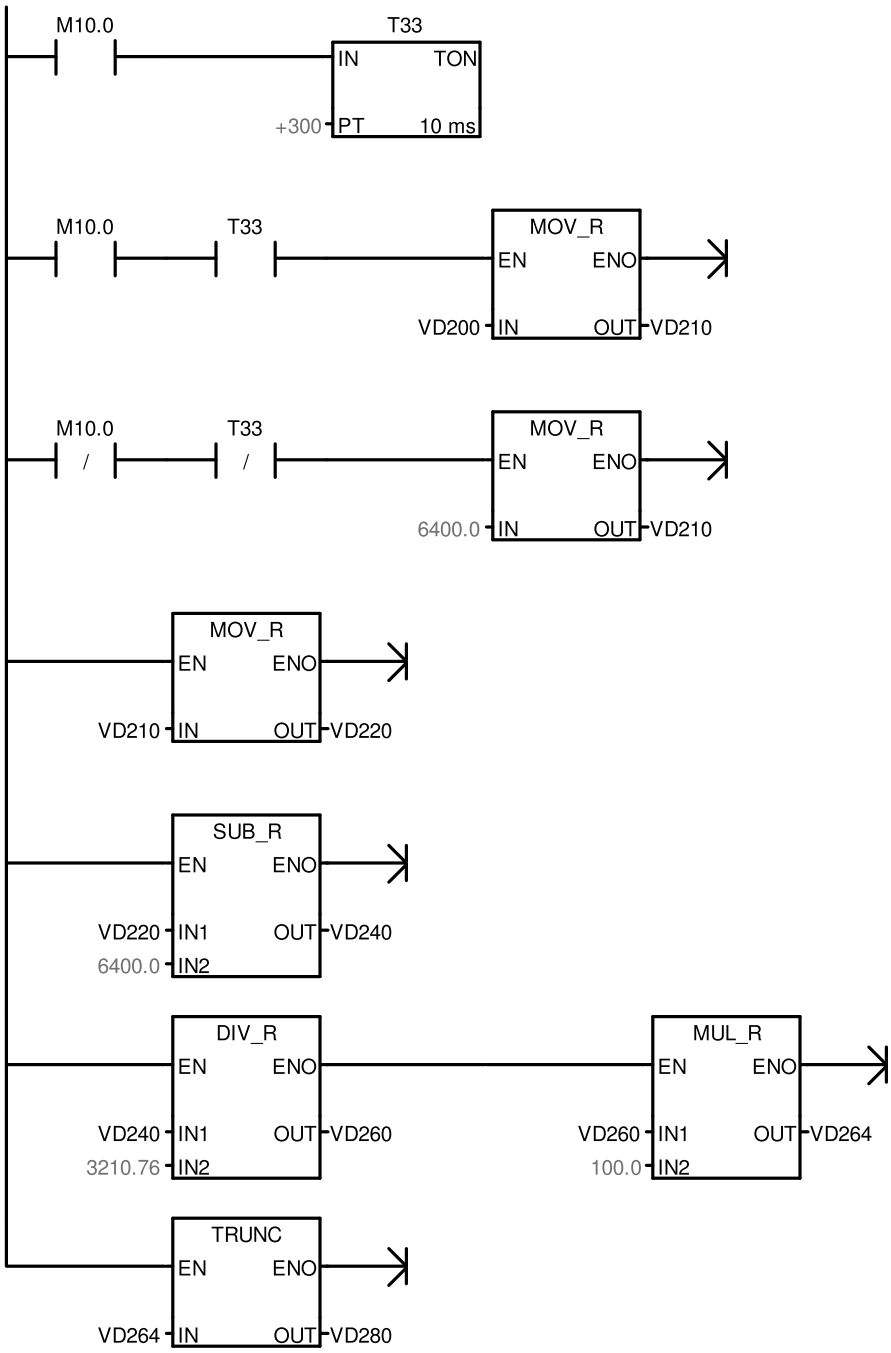
Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

PROGRAM COMMENTS

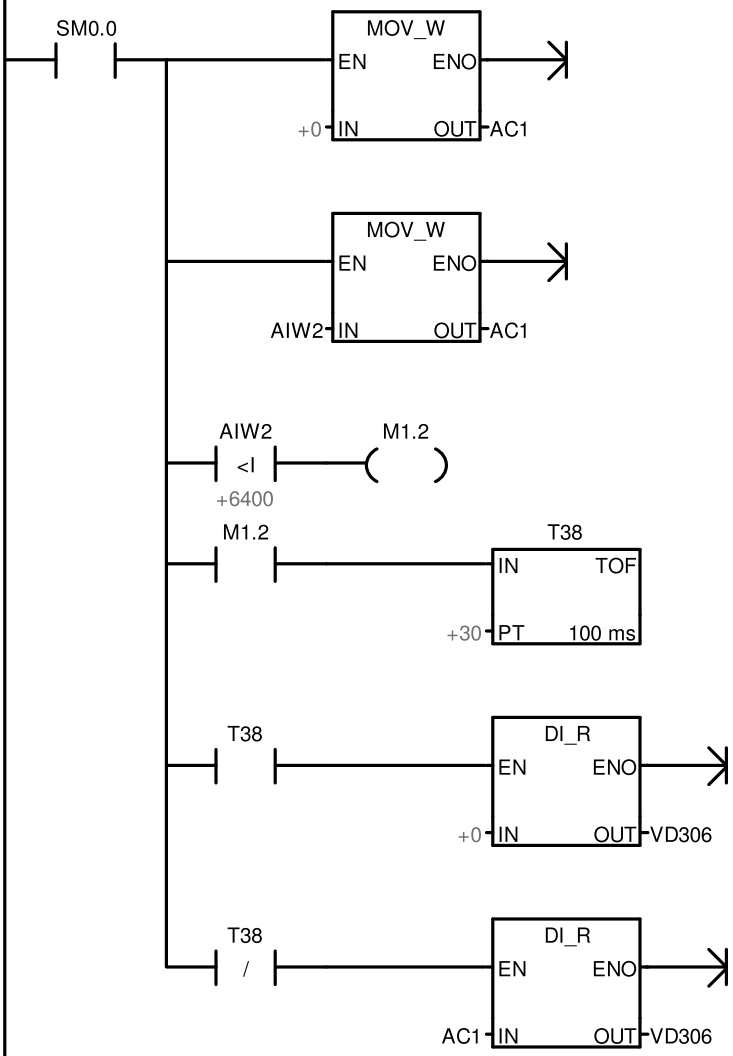
Network 1 mag meter

Network Comment

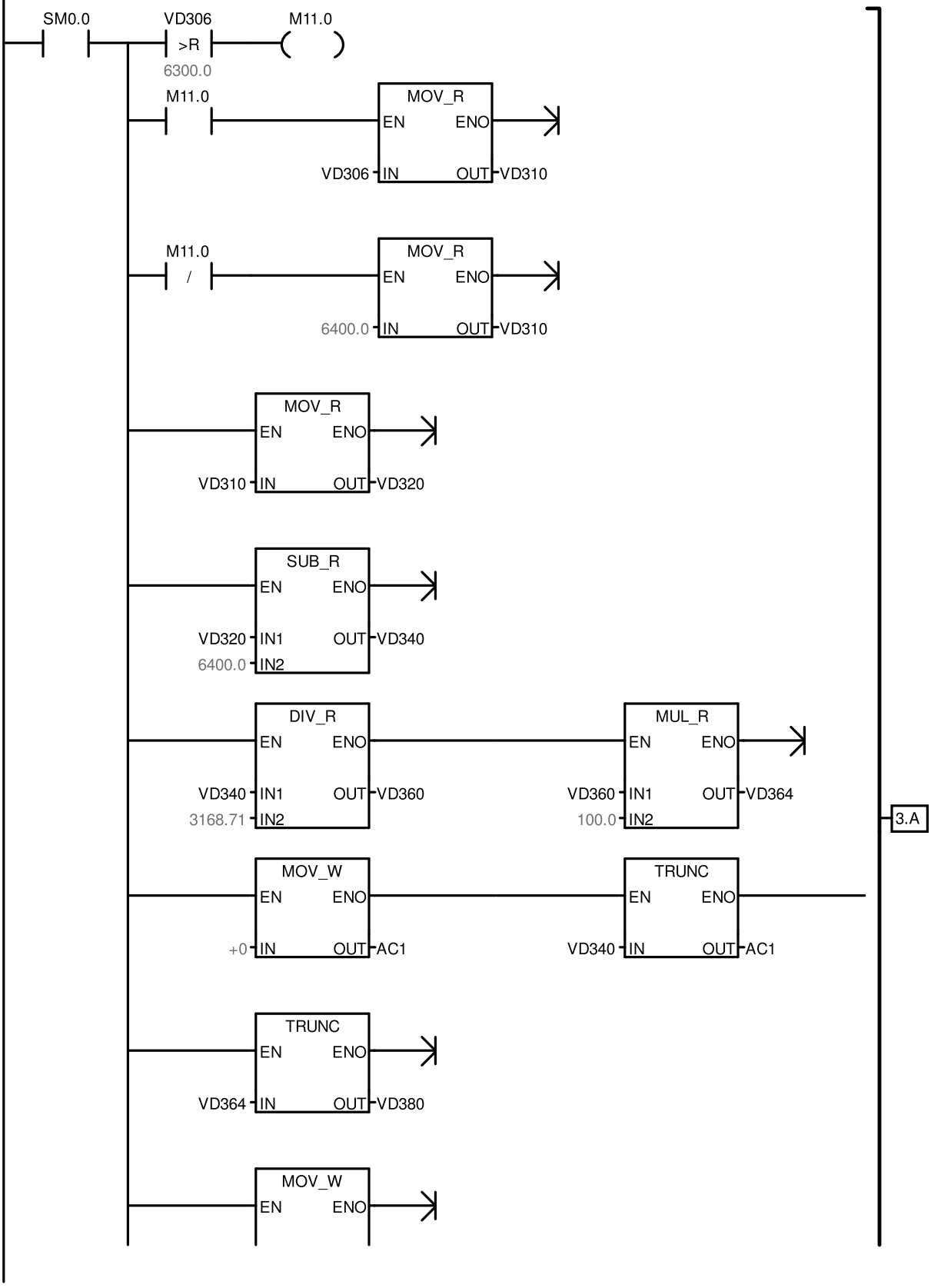


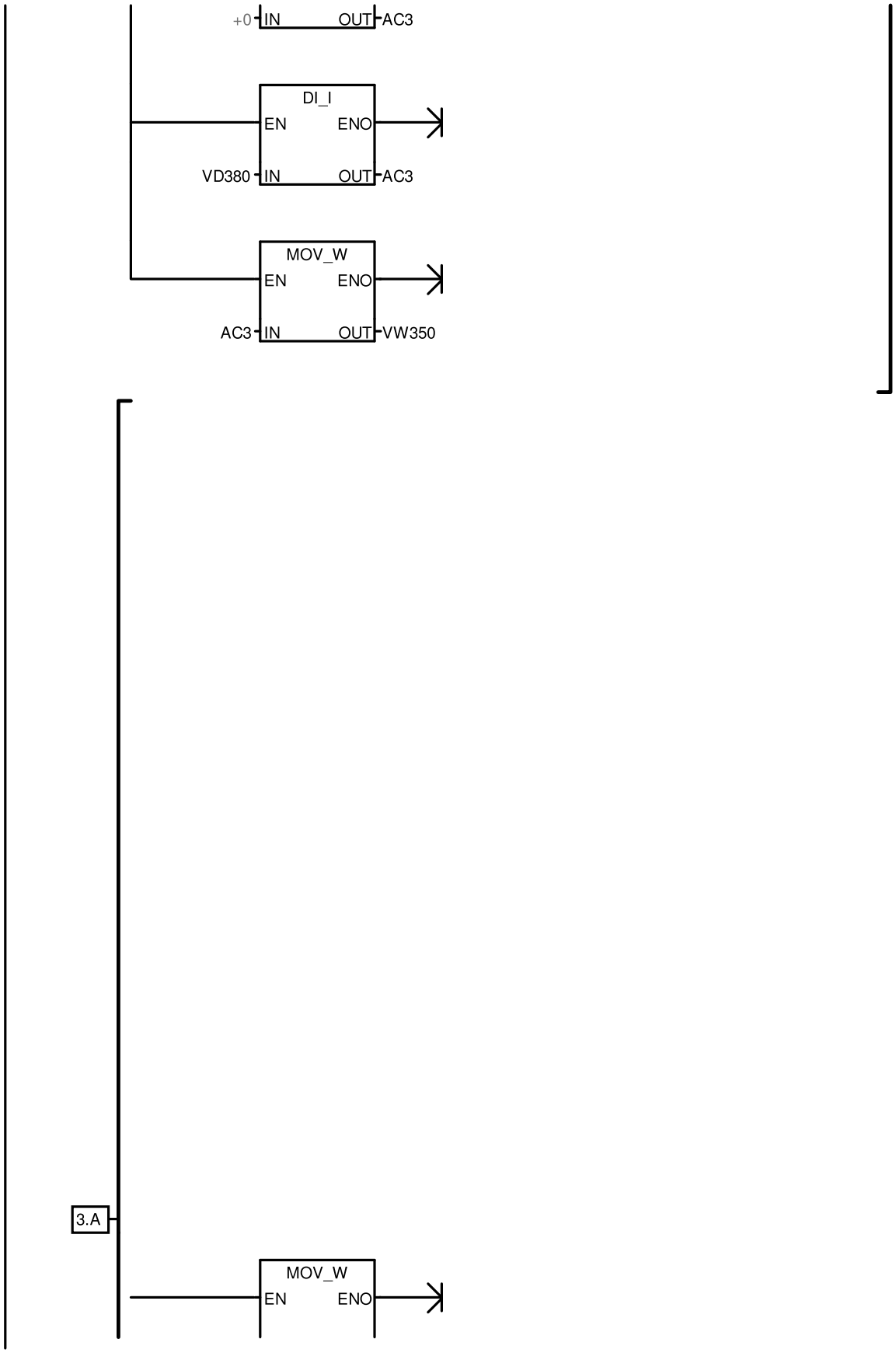

M10.0
T33
IN
TON
+300
PT
10 ms
M10.0
T33
MOV_R
EN
ENO
VD200
IN
OUT
VD210
M10.0
/
T33
/
MOV_R
EN
ENO
6400.0
IN
OUT
VD210
MOV_R
EN
ENO
VD210
IN
OUT
VD220
SUB_R
EN
ENO
VD220
IN1
OUT
VD240
6400.0
IN2
DIV_R
EN
ENO
VD240
IN1
OUT
VD260
3210.76
IN2
MUL_R
EN
ENO
VD260
IN1
OUT
VD264
100.0
IN2
TRUNC
EN
ENO
VD264
IN
OUT
VD280

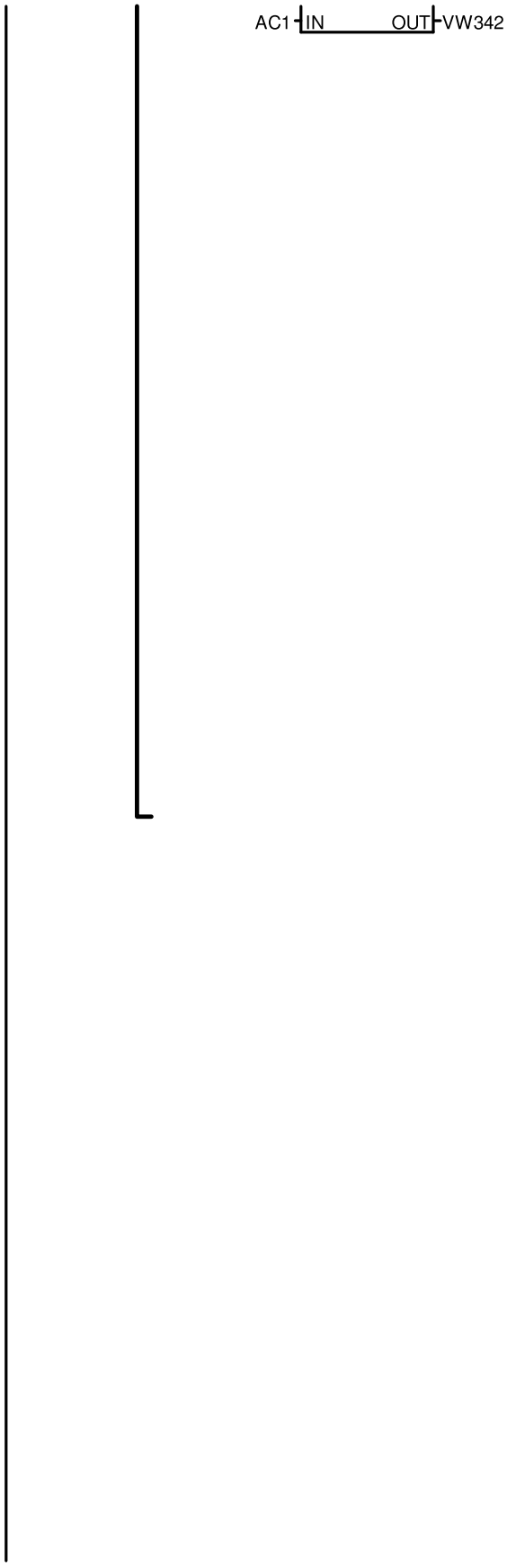
Network 2 Radio Signal 1



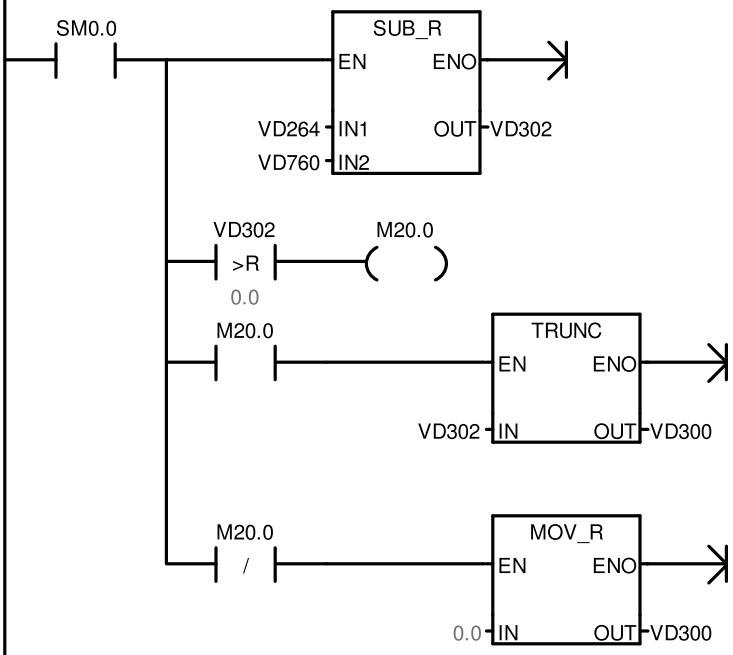
Network 3 Radio Signal 2



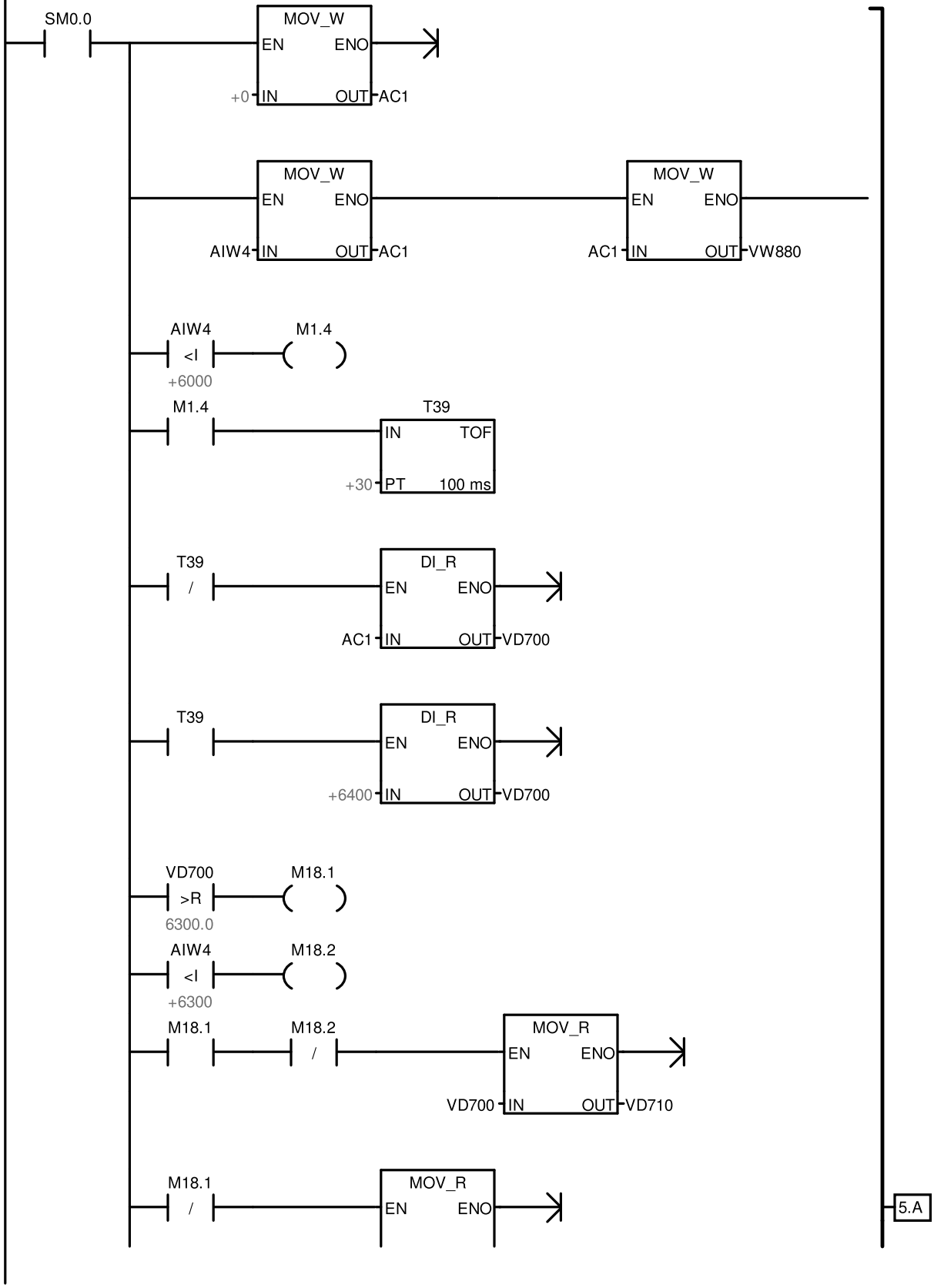

+0
IN
OUT
AC3
DI_I
EN
ENO
VD380
IN
OUT
AC3
MOV_W
EN
ENO
AC3
IN
OUT
VW350
3.A
MOV_W
EN
ENO

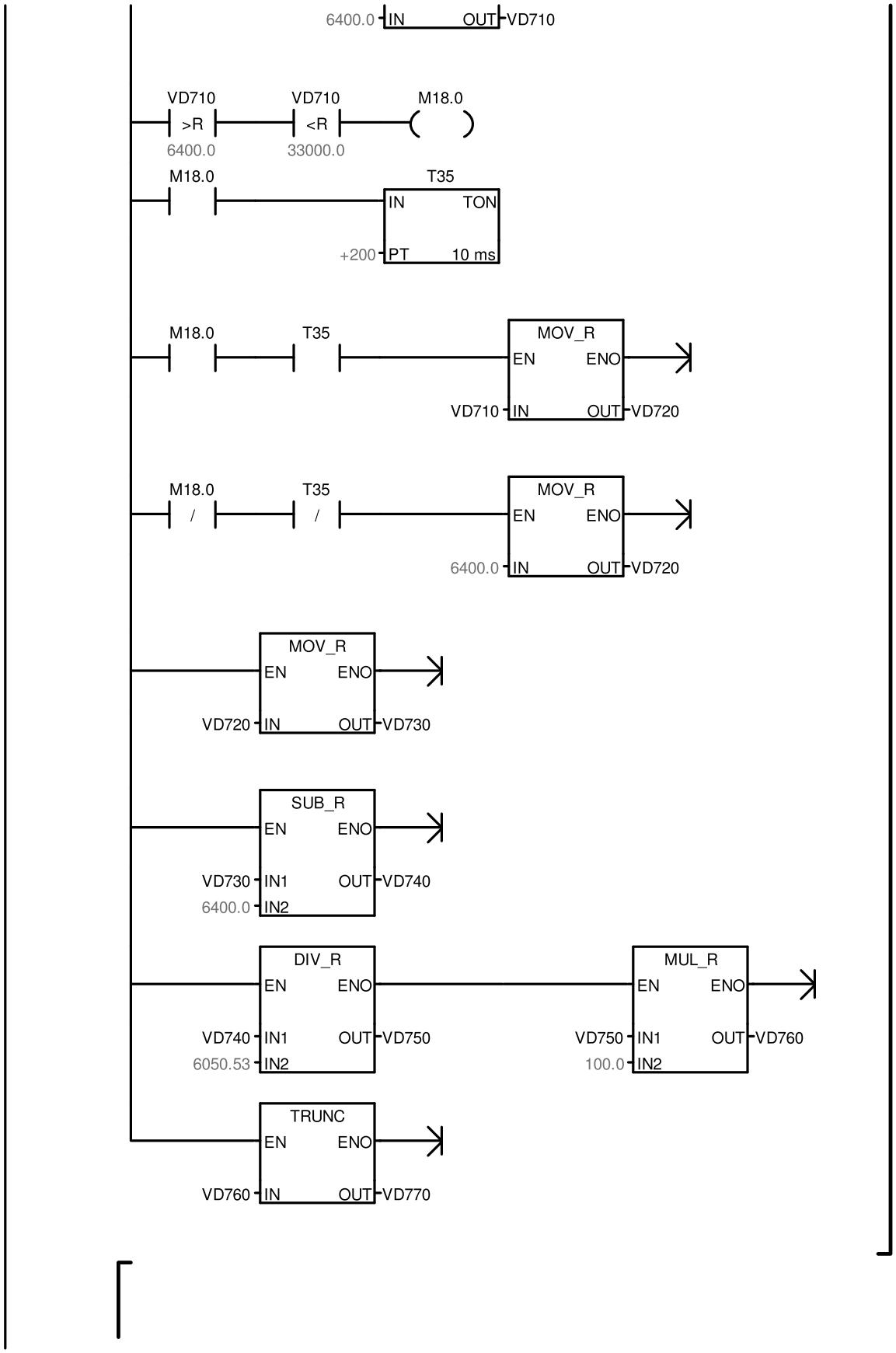

AC1
IN
OUT
VW342

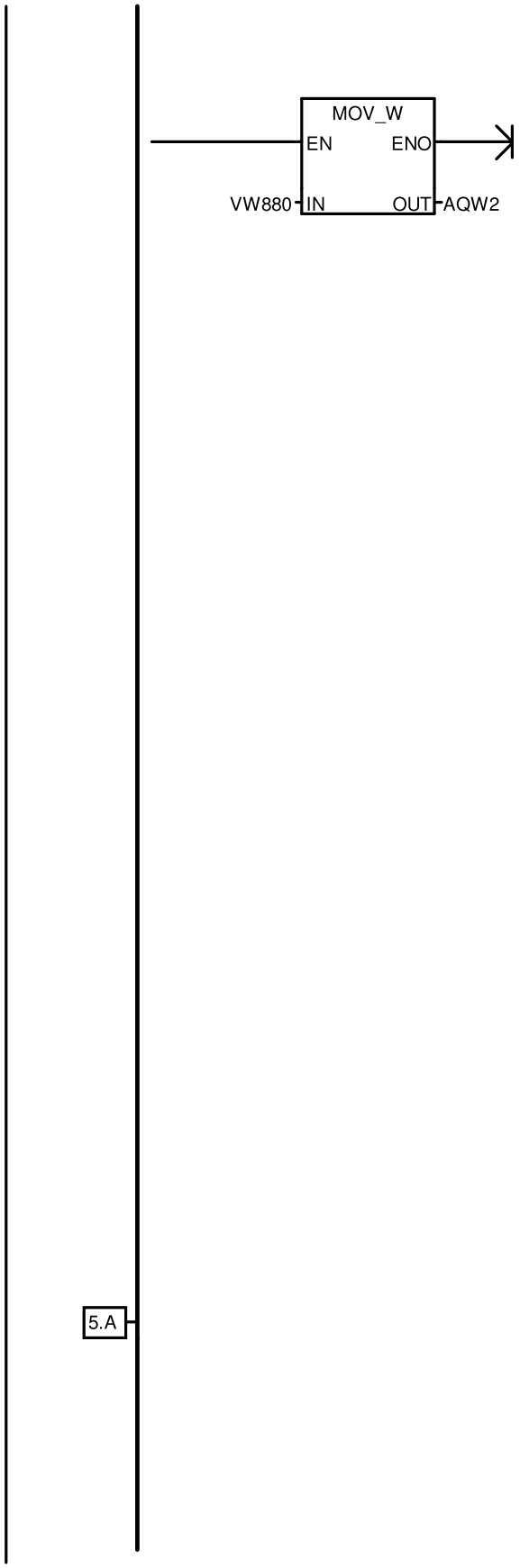
Network 4 CV Flow

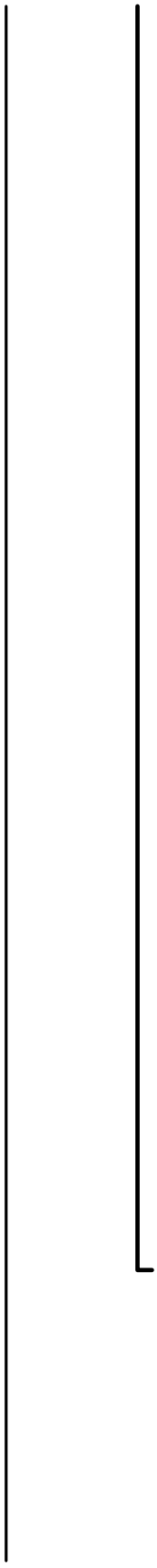


Network 5 Hydro Flow

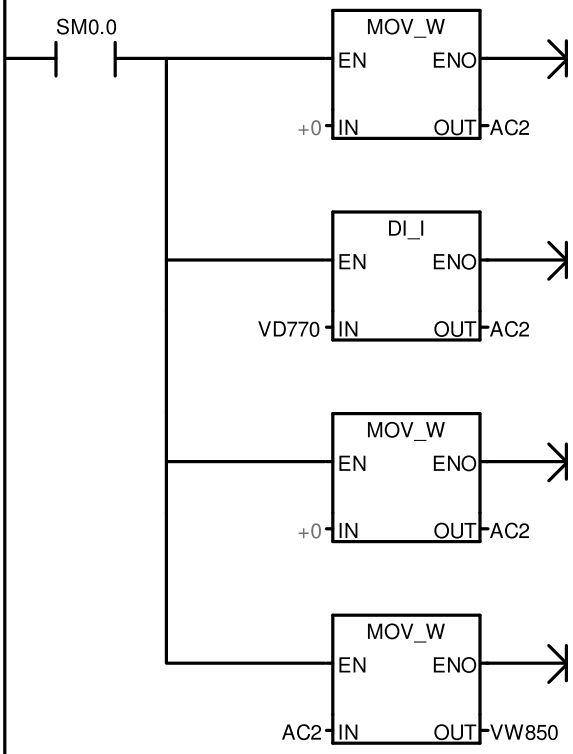



6400.0
IN
OUT
VD710
VD710
>R
6400.0
VD710
<R
33000.0
M18.0
M18.0
T35
IN
TON
+200
PT
10 ms
M18.0
T35
MOV_R
EN
ENO
VD710
IN
OUT
VD720
M18.0
/
T35
/
MOV_R
EN
ENO
6400.0
IN
OUT
VD720
MOV_R
EN
ENO
VD720
IN
OUT
VD730
SUB_R
EN
ENO
VD730
IN1
OUT
VD740
6400.0
IN2
DIV_R
EN
ENO
VD740
IN1
OUT
VD750
6050.53
IN2
MUL_R
EN
ENO
VD750
IN1
OUT
VD760
100.0
IN2
TRUNC
EN
ENO
VD760
IN
OUT
VD770

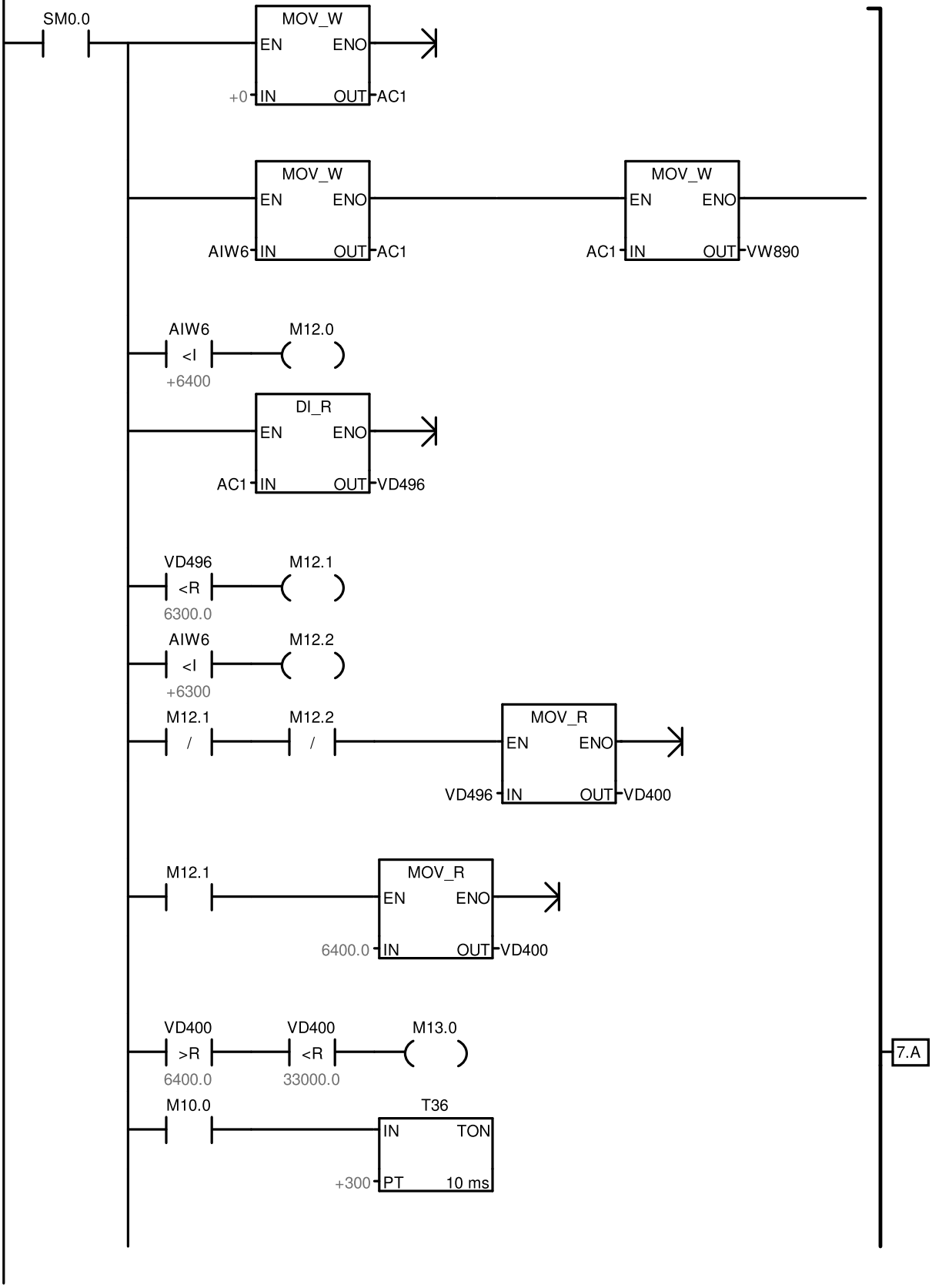

MOV_W
EN
ENO
VW880
IN
OUT
AQW2
5.A

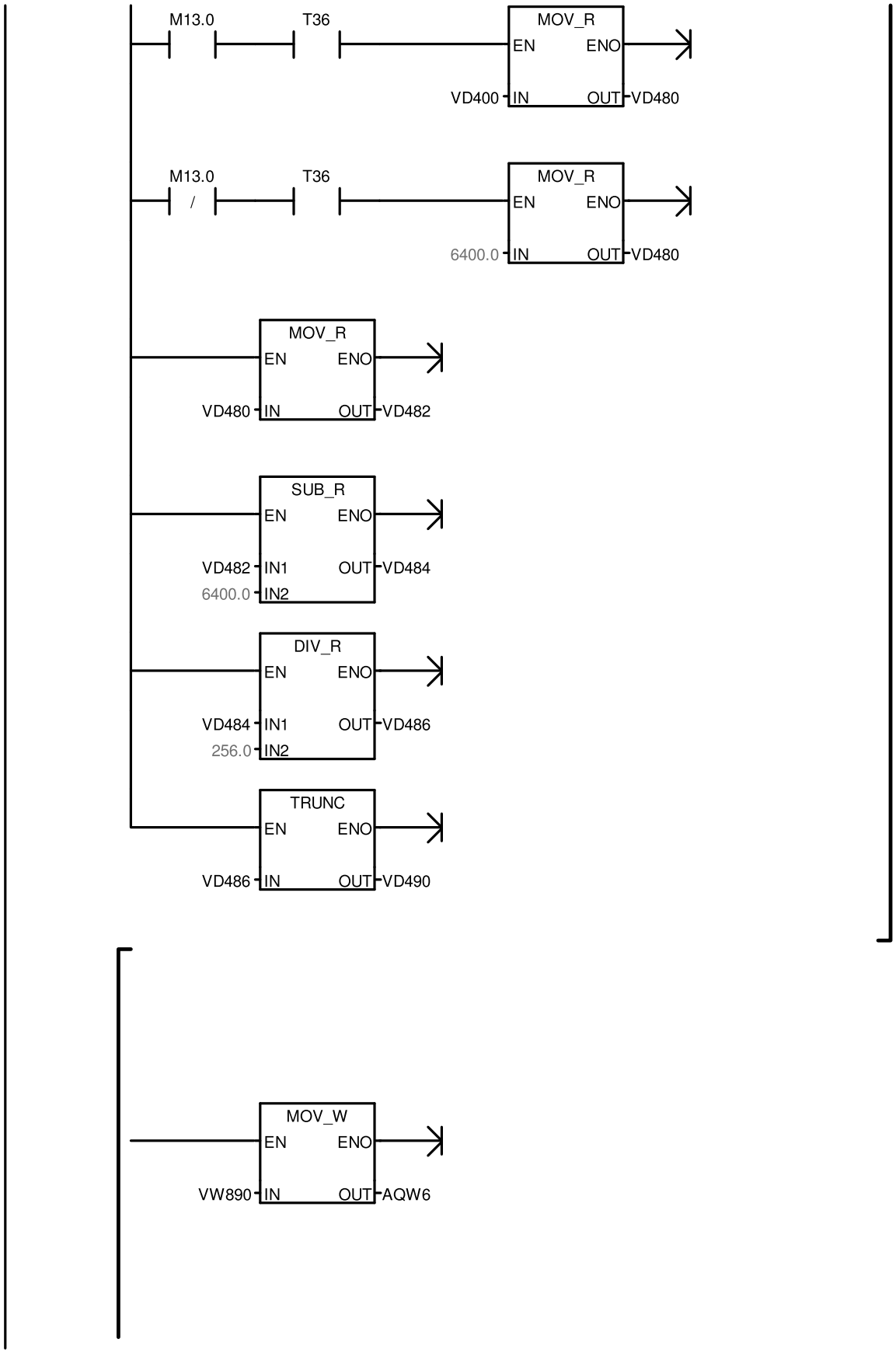


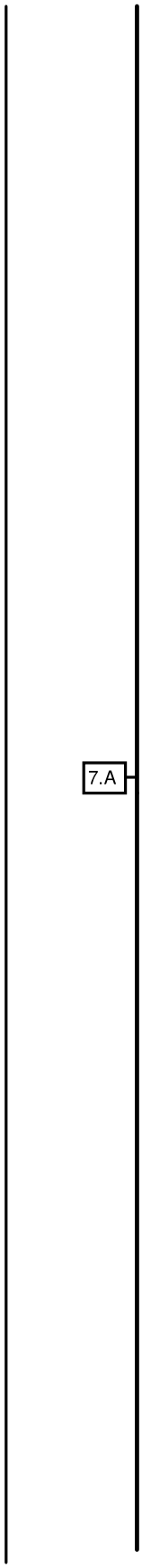
Network 6 hydro Condition



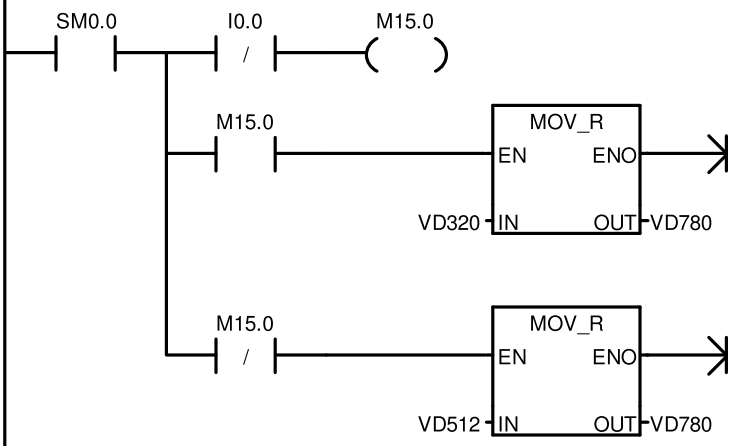
Network 7 Control Vale %



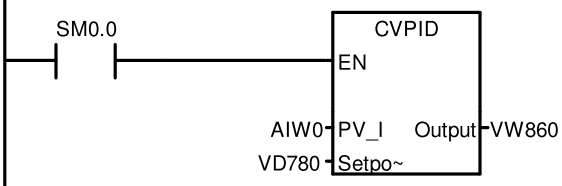

M13.0
T36
MOV_R
EN
ENO
VD400
IN
OUT
VD480
M13.0
/
T36
MOV_R
EN
ENO
6400.0
IN
OUT
VD480
MOV_R
EN
ENO
VD480
IN
OUT
VD482
SUB_R
EN
ENO
VD482
IN1
OUT
VD484
6400.0
IN2
DIV_R
EN
ENO
VD484
IN1
OUT
VD486
256.0
IN2
TRUNC
EN
ENO
VD486
IN
OUT
VD490
MOV_W
EN
ENO
VW890
IN
OUT
AQW6


7.A

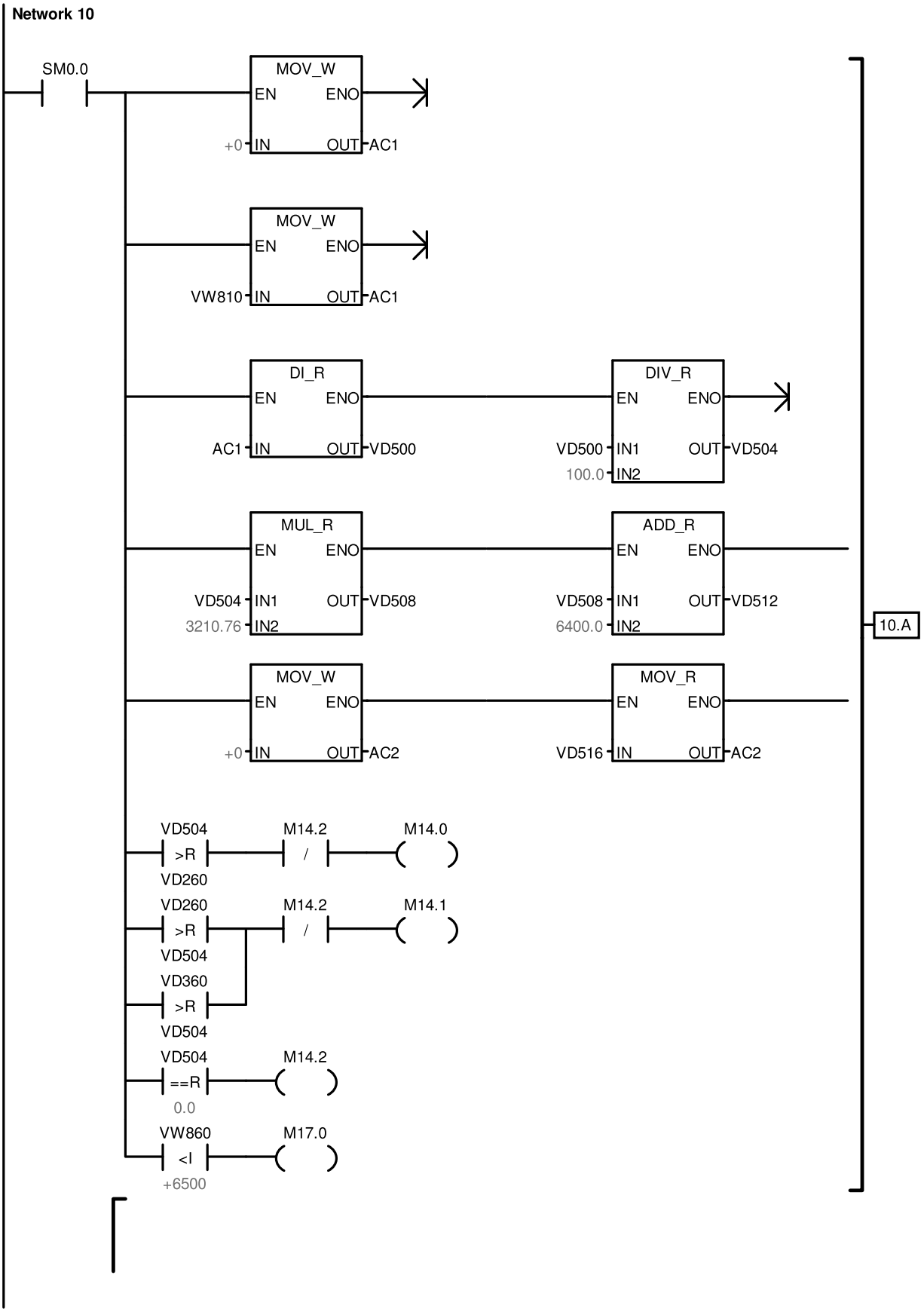
Network 8 Auto/Manual Control

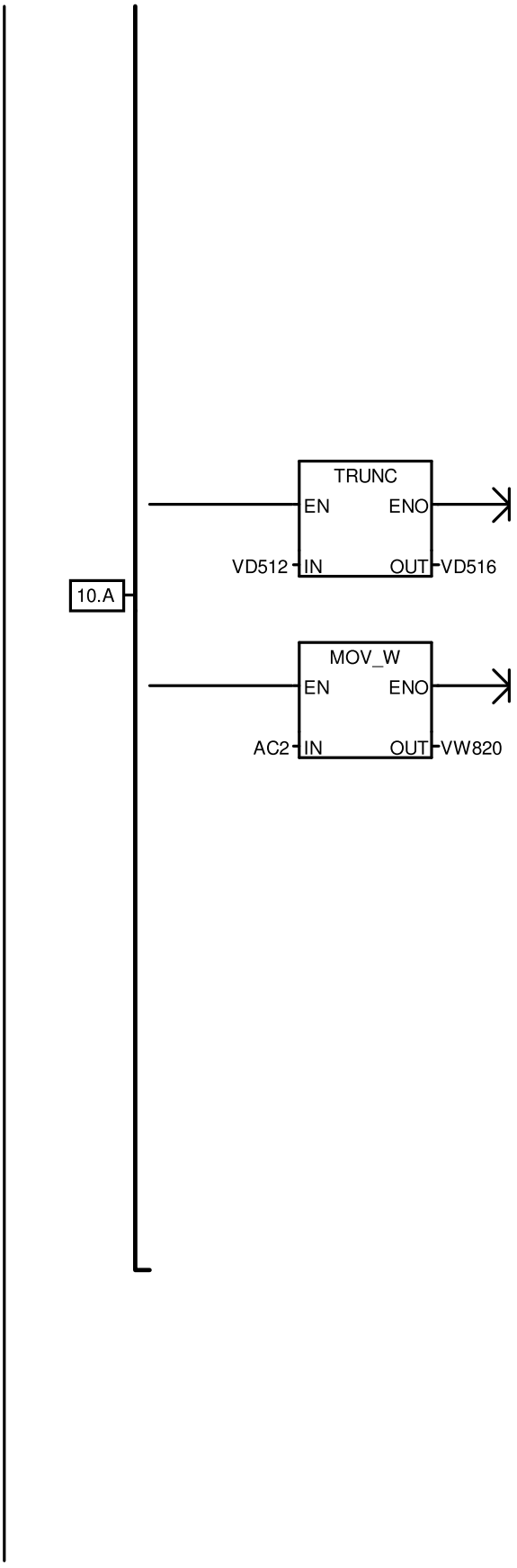


Network 9 PID Loop Control

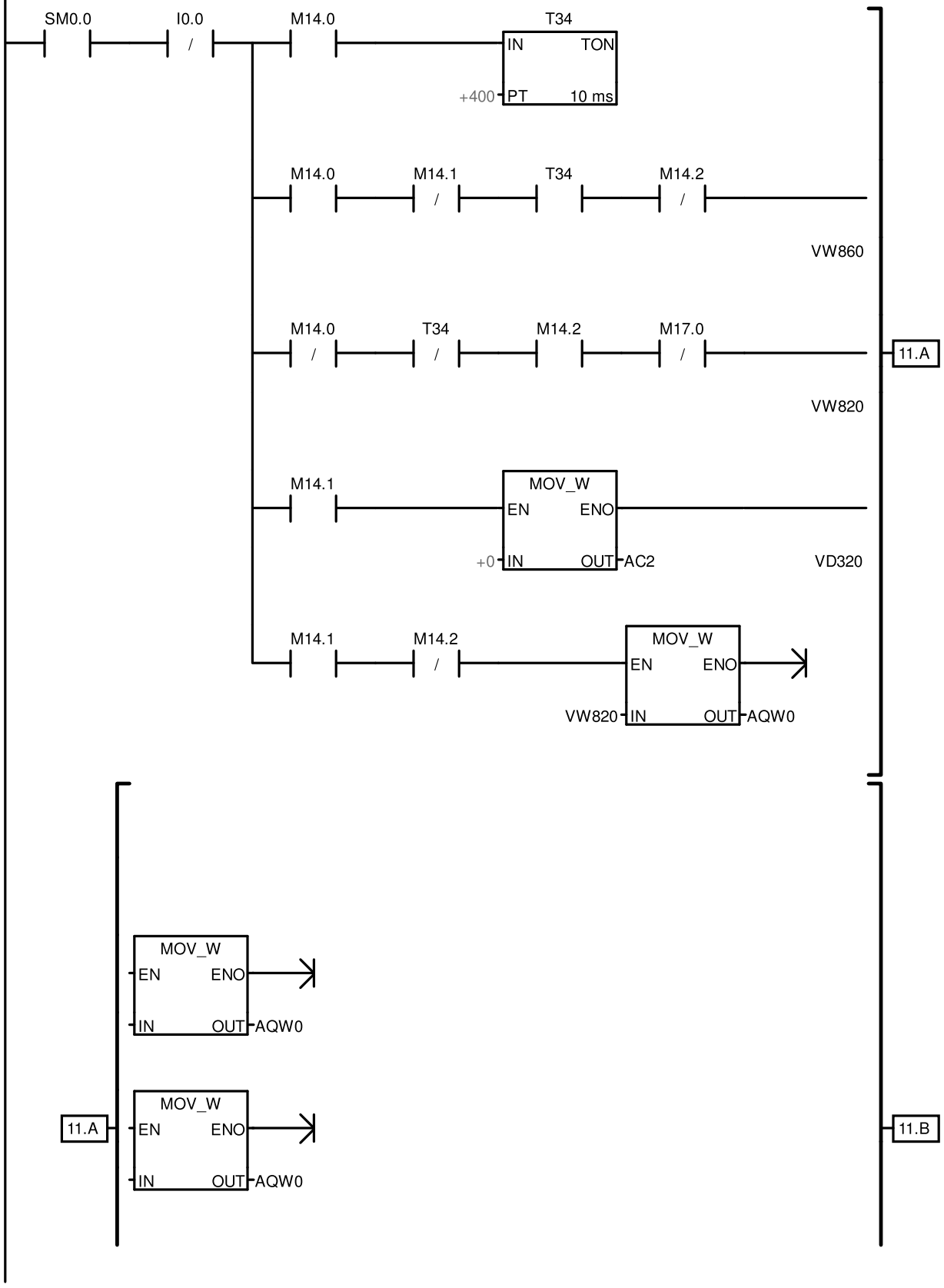


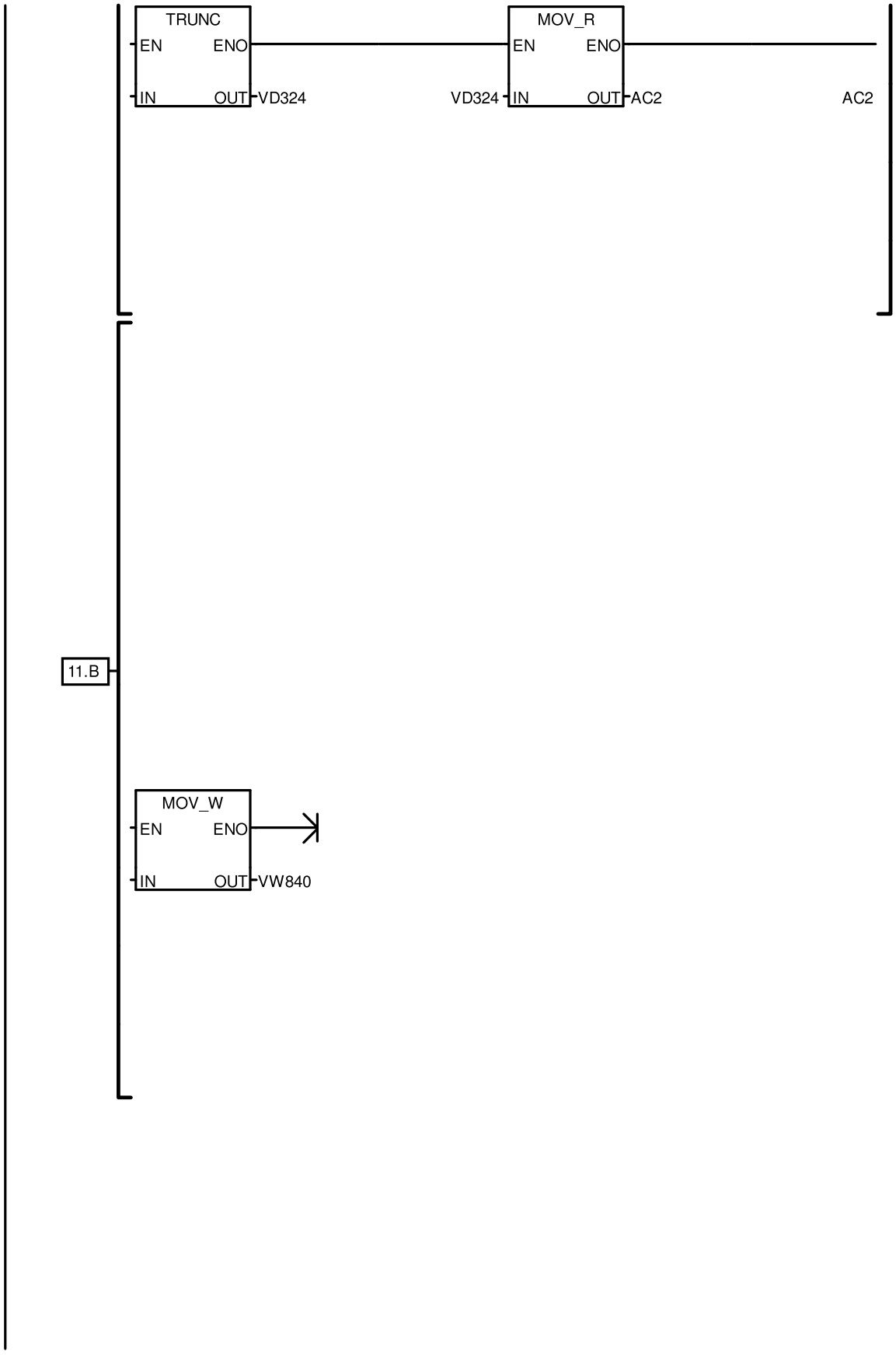
Network 10


SM0.0
MOV_W
EN
ENO
+0
IN
OUT
AC1
MOV_W
EN
ENO
VW810
IN
OUT
AC1
DI_R
EN
ENO
AC1
IN
OUT
VD500
DIV_R
EN
ENO
VD500
IN1
OUT
VD504
100.0
IN2
MUL_R
EN
ENO
VD504
IN1
OUT
VD508
3210.76
IN2
ADD_R
EN
ENO
VD508
IN1
OUT
VD512
6400.0
IN2
10.A
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_R
EN
ENO
VD516
IN
OUT
AC2
VD504
>R
VD260
M14.2
/
M14.0
VD260
>R
VD504
M14.2
/
M14.1
VD360
>R
VD504
VD504
==R
0.0
M14.2
VW860
<I
+6500
M17.0

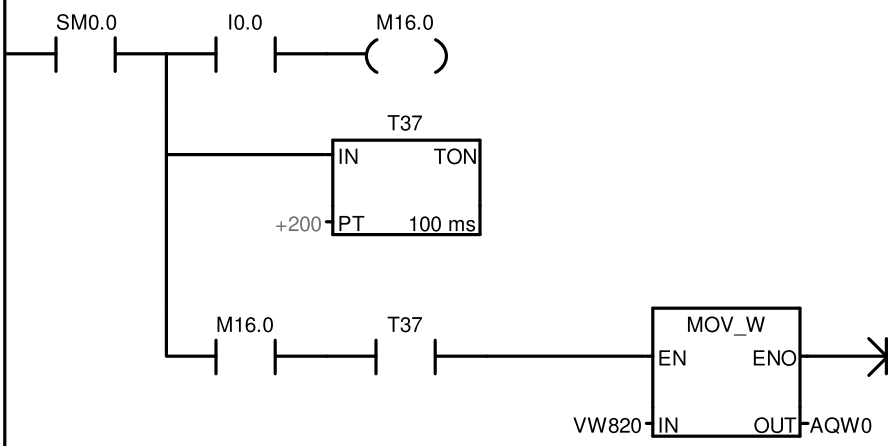

10.A
TRUNC
EN
ENO
VD512
IN
OUT
VD516
MOV_W
EN
ENO
AC2
IN
OUT
VW820

Network 11


SM0.0
I0.0
/
M14.0
T34
IN
TON
+400
PT
10 ms
M14.0
M14.1
/
T34
M14.2
/
VW860
M14.0
/
T34
/
M14.2
M17.0
/
11.A
VW820
M14.1
MOV_W
EN
ENO
+0
IN
OUT
AC2
VD320
M14.1
M14.2
/
MOV_W
EN
ENO
VW820
IN
OUT
AQW0
MOV_W
EN
ENO
IN
OUT
AQW0
11.A
MOV_W
EN
ENO
IN
OUT
AQW0
11.B


TRUNC
EN
ENO
IN
OUT
VD324
MOV_R
EN
ENO
VD324
IN
OUT
AC2
AC2
11.B
MOV_W
EN
ENO
IN
OUT
VW840

Network 12


SM0.0
I0.0
M16.0
T37
IN
TON
+200
PT
100 ms
M16.0
T37
MOV_W
EN
ENO
VW820
IN
OUT
AQW0

Block: SBR_0
Author:
Created: 09/02/2010 09:58:00 am
Last Modified: 09/13/2016 11:36:35 am

Symbol	Var Type	Data Type	Comment
EN	IN	BOOL	
	IN		
	IN_OUT		
	OUT		
	TEMP		

SUBROUTINE COMMENTS

Network 1 Network Title

Network Comment

Block: INT_0
Author:
Created: 09/02/2010 09:58:00 am
Last Modified: 09/13/2016 11:36:35 am

Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

INTERRUPT ROUTINE COMMENTS

Network 1 Network Title

Network Comment

Block: CVPID
Author:
Created: 03/12/2012 10:55:57 am
Last Modified: 09/13/2016 11:36:35 am

	Symbol	Var Type	Data Type	Comment
	EN	IN	BOOL	
LW0	PV_I	IN	INT	
LD2	Setpoint_R	IN	REAL	
		IN		
		IN_OUT		
LW6	Output	OUT	INT	
		OUT		
LD8	Tmp_DI	TEMP	DWORD	
LD12	Tmp_R	TEMP	REAL	
		TEMP		

This POU was created by the PID formula of the S7-200 Instruction Wizard.
To enable this configuration within the program, use SM0.0 to call this Subroutine from the MAIN program block every scan cycle. This code configures PID 0. See DB1 for the PID loop variable table starting at VB0. This subroutine initializes the variables used by the PID control logic and starts the PID Interrupt "CVPID_EXE" routine. The PID interrupt routine is called cyclically based on the PID sample time. For a complete description of the PID instruction see the S7-200 System Manual. Note:When the PID is in manual mode the output should be controlled by writing a normalized value(0.00 to 1.00) to the Manual Output parameter instead of changing the output directly. This will automatically provide a bumpless transfer when the PID is returned to automatic mode.

Block: TD_CTRL_1111
Author:
Created: 09/02/2010 09:58:11 am
Last Modified: 09/13/2016 11:36:35 am

Symbol	Var Type	Data Type	Comment
EN	IN	BOOL	
	IN		
	IN_OUT		
	OUT		
	TEMP		

Block: TD_ALM_1111
Author:
Created: 09/17/2010 10:59:10 am
Last Modified: 09/13/2016 11:36:35 am

	Symbol	Var Type	Data Type	Comment
	EN	IN	BOOL	
		IN		
L0.0	ALM_EN	IN_OUT	BOOL	
		IN_OUT		
		OUT		
LD1	Tmp_DI	TEMP	DWORD	
LD5	Tmp_R	TEMP	REAL	
		TEMP		

This POU was created by the PID formula of the S7-200 Instruction Wizard.
To enable this configuration within the program, use SM0.0 to call this Subroutine from the MAIN program block every scan cycle. This code configures PID 0. See DB1 for the PID loop variable table starting at VB402. This subroutine initializes the variables used by the PID control logic and starts the PID Interrupt "CVPID" routine. The PID interrupt routine is called cyclically based on the PID sample time. For a complete description of the PID instruction see the S7-200 System Manual. Note:When the PID is in manual mode the output should be controlled by writing a normalized value(0.00 to 1.00) to the Manual Output parameter instead of changing the output directly. This will automatically provide a bumpless transfer when the PID is returned to automatic mode.

Block: CVPID_EXE
Author:
Created: 03/12/2012 10:55:57 am
Last Modified: 09/13/2016 11:36:35 am

Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		


This POU was created by the PID formula of the S7-200 Instruction Wizard.
This interrupt routine implements Timed Interrupt for PID execution. This interrupt routine was attached in subroutine "CVPID".

PHOENIX RADIO SYSTEM HARDWARE					
LOCATION	Number	HOPKEY	ORD#	ASSY#	Module
PLANT	M 12746	12690	28 85 34 6	2248-10J1612372	RAD-ISM-900-XD-BUS
	RTM	NONE	28 67 32 2	25-01-05 J996194	RAD IN/OUT-2D-1A-I
TANK	REPEATER S-12690	12690	28 85 34 6	2248-10 J1612372	RAD-ISM-900-XD-BUS
	S0 12746	12690	28 85 34 6	2248-10 J1612372	
KC VALVE	S1 RTM	12690	28 85 34 6	2248-10 J1549813	RAD-ISM-900-XD-BUS
SPARE	S0 12690	12746	28 85 34 6	2248-10 J1549813	RAD-ISM-900-XD-BUS
	M 12690	12746	28 85 34 6	2248-10 J1549813	RAD-ISM-900-XD-BUS

ProtocolID	DeviceNam	TagName	DataType	DataCount	Retentive	Address	ArrayStart	ArrayEnd
0	<INTERNA	MP-810 HC	Discrete	1	FALSE		0	0
0	<INTERNA	FI_400_SC	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_HO/	Signed_int	1	FALSE		0	0
0	<INTERNA	ANY_ALAF	Discrete	1	FALSE		0	0
0	<INTERNA	MP_400_C	Floating_P	1	FALSE		0	0
0	<INTERNA	MP-710 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-800 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-700 HC	Discrete	1	FALSE		0	0
0	<INTERNA	CF_STAR1	Floating_P	1	FALSE		0	0
0	<INTERNA	DOSING_S	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	AI_01_SC/	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	CHEMICAL	Unsigned_	1	FALSE		0	0
0	<INTERNA	PUMP STF	Floating_P	1	FALSE		0	0
0	<INTERNA	PUMP CAF	Floating_P	1	FALSE		0	0
404	DEV001	DO_0_9	Discrete	1	FALSE	O:0/09	0	0
404	DEV001	LOOP 1 AC	Discrete	1	FALSE	B3:16/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/05	0	0
404	DEV001	DO_0_7	Discrete	1	FALSE	O:0/07	0	0
404	DEV001	DO_0_10	Discrete	1	FALSE	O:0/10	0	0
404	DEV001	DO_0_8	Discrete	1	FALSE	O:0/08	0	0
404	DEV001	LOOP 2 AC	Discrete	1	FALSE	B3:16/01	0	0
404	DEV001	DO_0_11	Discrete	1	FALSE	O:0/11	0	0
404	DEV001	PROC1_S	Discrete	1	FALSE	B20:16/03	0	0
404	DEV001	HPTK1_IN	Discrete	1	FALSE	B21:8/00	0	0
404	DEV001	NO HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	ANY_BLW	Discrete	1	FALSE	B23:2/00	0	0
404	DEV001	BLW2_RU	Discrete	1	FALSE	B23:2/02	0	0
404	DEV001	DO_0_1	Discrete	1	FALSE	O:0/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/00	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/04	0	0
404	DEV001	VFD3_HAI	Discrete	1	FALSE	B22:6/01	0	0
404	DEV001	BLW1_RU	Discrete	1	FALSE	B23:2/01	0	0
404	DEV001	DI_0_11	Discrete	1	FALSE	I:0/11	0	0
404	DEV001	DI_0_0	Discrete	1	FALSE	I:0/00	0	0
404	DEV001	DI_0_1	Discrete	1	FALSE	I:0/01	0	0
404	DEV001	DI_0_2	Discrete	1	FALSE	I:0/02	0	0
404	DEV001	DI_0_3	Discrete	1	FALSE	I:0/03	0	0
404	DEV001	DI_0_4	Discrete	1	FALSE	I:0/04	0	0
404	DEV001	DI_0_5	Discrete	1	FALSE	I:0/05	0	0
404	DEV001	DI_0_6	Discrete	1	FALSE	I:0/06	0	0
404	DEV001	DI_0_7	Discrete	1	FALSE	I:0/07	0	0
404	DEV001	DI_0_8	Discrete	1	FALSE	I:0/08	0	0
404	DEV001	DO_0_3	Discrete	1	FALSE	O:0/03	0	0
404	DEV001	DI_0_10	Discrete	1	FALSE	I:0/10	0	0
404	DEV001	DO_0_6	Discrete	1	FALSE	O:0/06	0	0
404	DEV001	DI_0_12	Discrete	1	FALSE	I:0/12	0	0
404	DEV001	DI_0_13	Discrete	1	FALSE	I:0/13	0	0
404	DEV001	DI_0_14	Discrete	1	FALSE	I:0/14	0	0
404	DEV001	DI_0_15	Discrete	1	FALSE	I:0/15	0	0
404	DEV001	DO_0_0	Discrete	1	FALSE	O:0/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/04	0	0
404	DEV001	DO_0_2	Discrete	1	FALSE	O:0/02	0	0

404	DEV001	VFD3_FAL	Discrete	1	FALSE	B20:0/07	0	0
404	DEV001	DO_0_4	Discrete	1	FALSE	O:0/04	0	0
404	DEV001	DO_0_5	Discrete	1	FALSE	O:0/05	0	0
404	DEV001	DI_0_9	Discrete	1	FALSE	I:0/09	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.3	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/02	0	0
404	DEV001	MP_710_H	Signed_int	1	FALSE	N24:5	0	0
404	DEV001	MP_800_H	Signed_int	1	FALSE	N24:6	0	0
404	DEV001	MP_810_H	Signed_int	1	FALSE	N24:7	0	0
404	DEV001	MP_700_S	Signed_int	1	FALSE	N24:12	0	0
404	DEV001	MP_710_S	Signed_int	1	FALSE	N24:13	0	0
404	DEV001	PRE_MP_I	Signed_int	1	FALSE	N24:8	0	0
404	DEV001	POST_MP	Signed_int	1	FALSE	N24:9	0	0
404	DEV001	PRE_RES_	Signed_int	1	FALSE	N7:32	0	0
404	DEV001	BLOWER2	Signed_int	1	FALSE	N24:2	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.2	0	0
404	DEV001	BLOWER1	Signed_int	1	FALSE	N24:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.1	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:50	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.2	0	0
404	DEV001	START_UI	Unsigned_	1	FALSE	N9:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:8	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:9	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:10	0	0
404	DEV001	POST_RES	Signed_int	1	FALSE	N7:62	0	0
404	DEV001	NO_HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B22:6/02	0	0
404	DEV001	LOOP 3 A(	Discrete	1	FALSE	B3:16/02	0	0
404	DEV001	CELL12_F	Discrete	1	FALSE	B23:12/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/01	0	0
404	DEV001	BLW_DPS	Discrete	1	FALSE	B23:2/04	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/03	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:11/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/01	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/02	0	0
404	DEV001	MP_700_H	Signed_int	1	FALSE	N24:4	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/04	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B22:6/00	0	0
404	DEV001	ENABLE R	Discrete	1	FALSE	B20:30/03	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/04	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/01	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/00	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:8/06	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:8/05	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/03	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/04	0	0
404	DEV001	H2_COM_A	Discrete	1	FALSE	B23:2/09	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/03	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:26/05	0	0
404	DEV001	CELL22_C	Discrete	1	FALSE	B20:20/08	0	0
404	DEV001	CELL22_F	Discrete	1	FALSE	B23:22/02	0	0
404	DEV001	RECT2_FA	Discrete	1	FALSE	B23:20/00	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/02	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/03	0	0

404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/07	0	0
404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/08	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/01	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/02	0	0
404	DEV001	LAL_201	Discrete	1	FALSE	B23:5/06	0	0
404	DEV001	RACK2_AL	Discrete	1	FALSE	B20:9/02	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/06	0	0
404	DEV001	PROC2_RI	Discrete	1	FALSE	B20:26/04	0	0
404	DEV001	PROC2_ST	Discrete	1	FALSE	B20:26/03	0	0
404	DEV001	ANY_BRIN	Discrete	1	FALSE	B23:3/02	0	0
404	DEV001	NO_BLW_	Discrete	1	FALSE	B23:2/10	0	0
404	DEV001	BLW_610_	Discrete	1	FALSE	B20:1/08	0	0
404	DEV001	BLW_600_	Discrete	1	FALSE	B20:1/07	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/11	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/12	0	0
404	DEV001	RECT1_AM	Discrete	1	FALSE	B23:10/07	0	0
404	DEV001	RACK1_AL	Discrete	1	FALSE	B20:9/01	0	0
404	DEV001	CELL21_C	Discrete	1	FALSE	B20:20/07	0	0
404	DEV001	DI_0_17	Discrete	1	FALSE	I:0/17	0	0
404	DEV001	DI_0_18	Discrete	1	FALSE	I:0/18	0	0
404	DEV001	DI_0_19	Discrete	1	FALSE	I:0/19	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:3/00	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:3/01	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:2/07	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:8/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B23:1/05	0	0
404	DEV001	CELL11_C	Discrete	1	FALSE	B20:10/07	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:21/02	0	0
404	DEV001	CELL12_C	Discrete	1	FALSE	B20:10/08	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/07	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/07	0	0
404	DEV001	ESTOP_BU	Discrete	1	FALSE	B23:1/15	0	0
404	DEV001	BLW1_OFI	Discrete	1	FALSE	B23:2/05	0	0
404	DEV001	BLW2_OFI	Discrete	1	FALSE	B23:2/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:18/05	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/04	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/03	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:18/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:21/05	0	0
404	DEV001	LAH_201	Discrete	1	FALSE	B23:5/09	0	0
404	DEV001	H2_DETEC	Discrete	1	FALSE	B20:1/01	0	0
404	DEV001	VFD2_FAU	Discrete	1	FALSE	B20:0/06	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/02	0	0
404	DEV001	RACK1_RE	Discrete	1	FALSE	B21:0/00	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B21:6/00	0	0
404	DEV001	VFD3_HAN	Discrete	1	FALSE	B21:6/01	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B21:6/02	0	0
404	DEV001	HPTK2_IN	Discrete	1	FALSE	B21:8/01	0	0
404	DEV001	RACK2_RE	Discrete	1	FALSE	B21:10/00	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/01	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/02	0	0
404	DEV001	LU_201	Discrete	1	FALSE	B23:5/05	0	0
404	DEV001	VFD1_FAU	Discrete	1	FALSE	B20:0/05	0	0
404	DEV001	PROC1_RI	Discrete	1	FALSE	B20:16/04	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:11/05	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/06	0	0

404	DEV001	PRE_RESI	Unsigned_	1	FALSE	N7:10	0	0
404	DEV001	RECT1_AI	Discrete	1	FALSE	B23:10/08	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:11	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/03	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/02	0	0
404	DEV001	RECT1_FA	Discrete	1	FALSE	B23:10/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/09	0	0
404	DEV001	ANY_ALAF	Discrete	1	FALSE	B20:9/00	0	0
404	DEV001	PRE_DOS	Discrete	1	FALSE	B23:3/03	0	0
404	DEV001	CP_100_E	Discrete	1	FALSE	B23:1/13	0	0
404	DEV001	CP_200_E	Discrete	1	FALSE	B23:1/14	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/11	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/12	0	0
404	DEV001	YA_700_AI	Discrete	1	FALSE	B23:4/00	0	0
404	DEV001	YA_710_AI	Discrete	1	FALSE	B23:4/02	0	0
404	DEV001	PRE_NO_I	Discrete	1	FALSE	B23:4/04	0	0
404	DEV001	FU_700_AI	Discrete	1	FALSE	B23:5/10	0	0
404	DEV001	AU_700	Discrete	1	FALSE	B23:5/11	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/01	0	0
404	DEV001	AAH_700	Discrete	1	FALSE	B23:5/13	0	0
404	DEV001	ANY_HYP(	Discrete	1	FALSE	B23:3/01	0	0
404	DEV001	POST_DO	Discrete	1	FALSE	B23:3/04	0	0
404	DEV001	YA_800_AI	Discrete	1	FALSE	B23:4/10	0	0
404	DEV001	YA_810_AI	Discrete	1	FALSE	B23:4/12	0	0
404	DEV001	POST_NO_	Discrete	1	FALSE	B23:4/14	0	0
404	DEV001	FU_800_AI	Discrete	1	FALSE	B23:6/10	0	0
404	DEV001	AU_800	Discrete	1	FALSE	B23:6/11	0	0
404	DEV001	AAL_800	Discrete	1	FALSE	B23:6/12	0	0
404	DEV001	AAH_800	Discrete	1	FALSE	B23:6/13	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:16/05	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/06	0	0
404	DEV001	AAL_700	Discrete	1	FALSE	B23:5/12	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:46	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:18	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:19	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:20	0	0
404	DEV001	CELL 2 FL	Floating_P	1	FALSE	F31:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:40	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:45	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:13	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:51	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F52:3	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:56	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:2	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:3	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:4	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:12	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:13	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F51:2	0	0

404	DEV001	MP_810_S	Unsigned_	1	FALSE	N24:15	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:10	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:14	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:13	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:4	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:3	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:25	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:22	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:23	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:15	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:28	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:14	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F35:6	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F52:2	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F35:16	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:29	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:12	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:45	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:24	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:89	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:14	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:55	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:60	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:10	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:20	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:16	0	0
404	DEV001	H2_HD100	Floating_P	1	FALSE	F30:70	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:52	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:43	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:39	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:88	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:38	0	0
404	DEV001	NH3_PMP	Floating_P	1	FALSE	F35:100	0	0
404	DEV001	NH3_PMP2	Floating_P	1	FALSE	F35:110	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:23	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:22	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:24	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:57	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:85	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:82	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:80	0	0
404	DEV001	BRTK_SAL	Floating_P	1	FALSE	F30:100	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:22	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:29	0	0
404	DEV001	GAIN 1	Floating_P	1	FALSE	F35:47	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:49	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:53	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:55	0	0
404	DEV001	GAIN 2	Floating_P	1	FALSE	F35:57	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:59	0	0
404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F35:26	0	0

404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F53:2	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:70	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:43	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:71	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:67	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:24	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:23	0	0
404	DEV001	GAIN 3	Floating_P	1	FALSE	F35:67	0	0
404	DEV001	LOW LIMI	Floating_P	1	FALSE	F35:69	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:65	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:63	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:28	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:29	0	0
404	DEV001	DOSING F	Floating_P	1	FALSE	F51:3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:4	0	0
404	DEV001	MP_710_S	Unsigned_	1	FALSE	N7:28	0	0
404	DEV001	MP_810_S	Unsigned_	1	FALSE	N7:58	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N7:57	0	0
404	DEV001	MP_800_H	Unsigned_	1	FALSE	N7:55	0	0
404	DEV001	MP_810_H	Unsigned_	1	FALSE	N7:56	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:40	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:41	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:1	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:3	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:44	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:5	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:6	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:7	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.1	0	0
404	DEV001	PLC_TO_F	Unsigned_	1	FALSE	N9:0	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T41:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:18.PR	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:2	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:14	0	0
404	DEV001	BLW_ROT	Unsigned_	1	FALSE	N24:100	0	0
404	DEV001	BLW_600_	Unsigned_	1	FALSE	N24:10	0	0
404	DEV001	BLW_610_	Unsigned_	1	FALSE	N24:11	0	0
404	DEV001	DI_0_16	Discrete	1	FALSE	I:0/16	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N7:11	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N24:20	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N24:21	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N7:41	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:40	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:61	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:13	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:46	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:16	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:12	0	0
404	DEV001	PRE_RES_	Unsigned_	1	FALSE	N7:31	0	0
404	DEV001	MP_700_S	Unsigned_	1	FALSE	N7:27	0	0
404	DEV001	MP_700_H	Unsigned_	1	FALSE	N7:25	0	0

404	DEV001	MP_710_H	Unsigned_	1	FALSE	N7:26	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:45	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:42	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:43	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:79	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:15	0	0
404	DEV001	QR_710	Floating_P	1	FALSE	F30:3	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N24:14	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:58	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:59	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:60	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:68	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:69	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:102	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:105	0	0
404	DEV001	BLW1_QR	Floating_P	1	FALSE	F30:0	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:49	0	0
404	DEV001	QR_700	Floating_P	1	FALSE	F30:2	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:48	0	0
404	DEV001	QR_800	Floating_P	1	FALSE	F30:4	0	0
404	DEV001	QR_810	Floating_P	1	FALSE	F30:5	0	0
404	DEV001	AAL_700_S	Floating_P	1	FALSE	F30:41	0	0
404	DEV001	AAH_700_	Floating_P	1	FALSE	F30:42	0	0
404	DEV001	PRE_MP_(	Floating_P	1	FALSE	F51:9	0	0
404	DEV001	PRE_MP_S	Floating_P	1	FALSE	F51:10	0	0
404	DEV001	PRE_FP_C	Floating_P	1	FALSE	F51:14	0	0
404	DEV001	AAH_800_	Floating_P	1	FALSE	F30:62	0	0
404	DEV001	AAL_800_S	Floating_P	1	FALSE	F30:61	0	0
404	DEV001	POST_FP_	Floating_P	1	FALSE	F51:34	0	0
404	DEV001	BLW2_QR	Floating_P	1	FALSE	F30:1	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:139	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:51	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:110	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:118	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:119	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:108	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:109	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:120	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:130	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:128	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:50	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:129	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:78	0	0
404	DEV001	ECR_100_	Floating_P	1	FALSE	F30:6	0	0
404	DEV001	RECT2_VC	Floating_P	1	FALSE	F32:0	0	0
404	DEV001	RECT2_AM	Floating_P	1	FALSE	F32:10	0	0
404	DEV001	ECR_200_	Floating_P	1	FALSE	F30:7	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:30	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:83	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:84	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:38	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:39	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:40	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:138	0	0

ProtocolID	DeviceNam	TagName	DataType	DataCount	Retentive	Address	ArrayStart	ArrayEnd
0	<INTERNA	MP-810 HC	Discrete	1	FALSE		0	0
0	<INTERNA	FI_400_SC	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_HO/	Signed_int	1	FALSE		0	0
0	<INTERNA	ANY_ALAF	Discrete	1	FALSE		0	0
0	<INTERNA	MP_400_C	Floating_P	1	FALSE		0	0
0	<INTERNA	MP-710 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-800 HC	Discrete	1	FALSE		0	0
0	<INTERNA	MP-700 HC	Discrete	1	FALSE		0	0
0	<INTERNA	CF_STAR1	Floating_P	1	FALSE		0	0
0	<INTERNA	DOSING_S	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	AI_01_SC/	Floating_P	1	FALSE		0	0
0	<INTERNA	VFD1_SPE	Floating_P	1	FALSE		0	0
0	<INTERNA	CHEMICAL	Unsigned_	1	FALSE		0	0
0	<INTERNA	PUMP STF	Floating_P	1	FALSE		0	0
0	<INTERNA	PUMP CAF	Floating_P	1	FALSE		0	0
404	DEV001	DO_0_9	Discrete	1	FALSE	O:0/09	0	0
404	DEV001	LOOP 1 AC	Discrete	1	FALSE	B3:16/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/05	0	0
404	DEV001	DO_0_7	Discrete	1	FALSE	O:0/07	0	0
404	DEV001	DO_0_10	Discrete	1	FALSE	O:0/10	0	0
404	DEV001	DO_0_8	Discrete	1	FALSE	O:0/08	0	0
404	DEV001	LOOP 2 AC	Discrete	1	FALSE	B3:16/01	0	0
404	DEV001	DO_0_11	Discrete	1	FALSE	O:0/11	0	0
404	DEV001	PROC1_S	Discrete	1	FALSE	B20:16/03	0	0
404	DEV001	HPTK1_IN	Discrete	1	FALSE	B21:8/00	0	0
404	DEV001	NO HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	ANY_BLW	Discrete	1	FALSE	B23:2/00	0	0
404	DEV001	BLW2_RU	Discrete	1	FALSE	B23:2/02	0	0
404	DEV001	DO_0_1	Discrete	1	FALSE	O:0/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/00	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/01	0	0
404	DEV001	HPTK1_LE	Discrete	1	FALSE	B23:6/04	0	0
404	DEV001	VFD3_HAI	Discrete	1	FALSE	B22:6/01	0	0
404	DEV001	BLW1_RU	Discrete	1	FALSE	B23:2/01	0	0
404	DEV001	DI_0_11	Discrete	1	FALSE	I:0/11	0	0
404	DEV001	DI_0_0	Discrete	1	FALSE	I:0/00	0	0
404	DEV001	DI_0_1	Discrete	1	FALSE	I:0/01	0	0
404	DEV001	DI_0_2	Discrete	1	FALSE	I:0/02	0	0
404	DEV001	DI_0_3	Discrete	1	FALSE	I:0/03	0	0
404	DEV001	DI_0_4	Discrete	1	FALSE	I:0/04	0	0
404	DEV001	DI_0_5	Discrete	1	FALSE	I:0/05	0	0
404	DEV001	DI_0_6	Discrete	1	FALSE	I:0/06	0	0
404	DEV001	DI_0_7	Discrete	1	FALSE	I:0/07	0	0
404	DEV001	DI_0_8	Discrete	1	FALSE	I:0/08	0	0
404	DEV001	DO_0_3	Discrete	1	FALSE	O:0/03	0	0
404	DEV001	DI_0_10	Discrete	1	FALSE	I:0/10	0	0
404	DEV001	DO_0_6	Discrete	1	FALSE	O:0/06	0	0
404	DEV001	DI_0_12	Discrete	1	FALSE	I:0/12	0	0
404	DEV001	DI_0_13	Discrete	1	FALSE	I:0/13	0	0
404	DEV001	DI_0_14	Discrete	1	FALSE	I:0/14	0	0
404	DEV001	DI_0_15	Discrete	1	FALSE	I:0/15	0	0
404	DEV001	DO_0_0	Discrete	1	FALSE	O:0/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/04	0	0
404	DEV001	DO_0_2	Discrete	1	FALSE	O:0/02	0	0

404	DEV001	VFD3_FAL	Discrete	1	FALSE	B20:0/07	0	0
404	DEV001	DO_0_4	Discrete	1	FALSE	O:0/04	0	0
404	DEV001	DO_0_5	Discrete	1	FALSE	O:0/05	0	0
404	DEV001	DI_0_9	Discrete	1	FALSE	I:0/09	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.3	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/02	0	0
404	DEV001	MP_710_H	Signed_int	1	FALSE	N24:5	0	0
404	DEV001	MP_800_H	Signed_int	1	FALSE	N24:6	0	0
404	DEV001	MP_810_H	Signed_int	1	FALSE	N24:7	0	0
404	DEV001	MP_700_S	Signed_int	1	FALSE	N24:12	0	0
404	DEV001	MP_710_S	Signed_int	1	FALSE	N24:13	0	0
404	DEV001	PRE_MP_I	Signed_int	1	FALSE	N24:8	0	0
404	DEV001	POST_MP	Signed_int	1	FALSE	N24:9	0	0
404	DEV001	PRE_RES_	Signed_int	1	FALSE	N7:32	0	0
404	DEV001	BLOWER2	Signed_int	1	FALSE	N24:2	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.2	0	0
404	DEV001	BLOWER1	Signed_int	1	FALSE	N24:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.1	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:50	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.2	0	0
404	DEV001	START_UI	Unsigned_	1	FALSE	N9:1	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:5.3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:8	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:9	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:10	0	0
404	DEV001	POST_RES	Signed_int	1	FALSE	N7:62	0	0
404	DEV001	NO_HYPO	Discrete	1	FALSE	B23:1/00	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B22:6/02	0	0
404	DEV001	LOOP 3 A(	Discrete	1	FALSE	B3:16/02	0	0
404	DEV001	CELL12_F	Discrete	1	FALSE	B23:12/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/01	0	0
404	DEV001	BLW_DPS	Discrete	1	FALSE	B23:2/04	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:15/03	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:11/02	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/01	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/02	0	0
404	DEV001	MP_700_H	Signed_int	1	FALSE	N24:4	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/04	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B22:6/00	0	0
404	DEV001	ENABLE R	Discrete	1	FALSE	B20:30/03	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/04	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/01	0	0
404	DEV001	BRTK_LEV	Discrete	1	FALSE	B23:5/00	0	0
404	DEV001	CELL11_F	Discrete	1	FALSE	B23:8/06	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:8/05	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/03	0	0
404	DEV001	CELL11_P	Discrete	1	FALSE	B23:8/04	0	0
404	DEV001	H2_COM_A	Discrete	1	FALSE	B23:2/09	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B20:25/03	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:26/05	0	0
404	DEV001	CELL22_C	Discrete	1	FALSE	B20:20/08	0	0
404	DEV001	CELL22_F	Discrete	1	FALSE	B23:22/02	0	0
404	DEV001	RECT2_FA	Discrete	1	FALSE	B23:20/00	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/02	0	0
404	DEV001	RECT2_VC	Discrete	1	FALSE	B23:20/03	0	0

404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/07	0	0
404	DEV001	RECT2_AM	Discrete	1	FALSE	B23:20/08	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/01	0	0
404	DEV001	SHUTDOW	Discrete	1	FALSE	B23:1/02	0	0
404	DEV001	LAL_201	Discrete	1	FALSE	B23:5/06	0	0
404	DEV001	RACK2_AL	Discrete	1	FALSE	B20:9/02	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/06	0	0
404	DEV001	PROC2_RI	Discrete	1	FALSE	B20:26/04	0	0
404	DEV001	PROC2_ST	Discrete	1	FALSE	B20:26/03	0	0
404	DEV001	ANY_BRIN	Discrete	1	FALSE	B23:3/02	0	0
404	DEV001	NO_BLW_	Discrete	1	FALSE	B23:2/10	0	0
404	DEV001	BLW_610_	Discrete	1	FALSE	B20:1/08	0	0
404	DEV001	BLW_600_	Discrete	1	FALSE	B20:1/07	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/11	0	0
404	DEV001	DPAL_500	Discrete	1	FALSE	B23:2/12	0	0
404	DEV001	RECT1_AM	Discrete	1	FALSE	B23:10/07	0	0
404	DEV001	RACK1_AL	Discrete	1	FALSE	B20:9/01	0	0
404	DEV001	CELL21_C	Discrete	1	FALSE	B20:20/07	0	0
404	DEV001	DI_0_17	Discrete	1	FALSE	I:0/17	0	0
404	DEV001	DI_0_18	Discrete	1	FALSE	I:0/18	0	0
404	DEV001	DI_0_19	Discrete	1	FALSE	I:0/19	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:3/00	0	0
404	DEV001	PROC2_CI	Discrete	1	FALSE	B20:3/01	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:2/07	0	0
404	DEV001	H2_DET_1	Discrete	1	FALSE	B23:8/00	0	0
404	DEV001	PROCESS	Discrete	1	FALSE	B23:1/05	0	0
404	DEV001	CELL11_C	Discrete	1	FALSE	B20:10/07	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:21/02	0	0
404	DEV001	CELL12_C	Discrete	1	FALSE	B20:10/08	0	0
404	DEV001	CELL21_TI	Discrete	1	FALSE	B23:21/07	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/07	0	0
404	DEV001	ESTOP_BU	Discrete	1	FALSE	B23:1/15	0	0
404	DEV001	BLW1_OFI	Discrete	1	FALSE	B23:2/05	0	0
404	DEV001	BLW2_OFI	Discrete	1	FALSE	B23:2/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:18/05	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/04	0	0
404	DEV001	CELL21_P	Discrete	1	FALSE	B23:18/03	0	0
404	DEV001	CELL21_FI	Discrete	1	FALSE	B23:18/06	0	0
404	DEV001	CELL21_LI	Discrete	1	FALSE	B23:21/05	0	0
404	DEV001	LAH_201	Discrete	1	FALSE	B23:5/09	0	0
404	DEV001	H2_DETEC	Discrete	1	FALSE	B20:1/01	0	0
404	DEV001	VFD2_FAU	Discrete	1	FALSE	B20:0/06	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/02	0	0
404	DEV001	RACK1_RE	Discrete	1	FALSE	B21:0/00	0	0
404	DEV001	VFD3_OFF	Discrete	1	FALSE	B21:6/00	0	0
404	DEV001	VFD3_HAN	Discrete	1	FALSE	B21:6/01	0	0
404	DEV001	VFD3_AUT	Discrete	1	FALSE	B21:6/02	0	0
404	DEV001	HPTK2_IN	Discrete	1	FALSE	B21:8/01	0	0
404	DEV001	RACK2_RE	Discrete	1	FALSE	B21:10/00	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/01	0	0
404	DEV001	RACK2_ST	Discrete	1	FALSE	B21:10/02	0	0
404	DEV001	LU_201	Discrete	1	FALSE	B23:5/05	0	0
404	DEV001	VFD1_FAU	Discrete	1	FALSE	B20:0/05	0	0
404	DEV001	PROC1_RI	Discrete	1	FALSE	B20:16/04	0	0
404	DEV001	CELL11_LI	Discrete	1	FALSE	B23:11/05	0	0
404	DEV001	CELL11_TI	Discrete	1	FALSE	B23:11/06	0	0

404	DEV001	PRE_RESI	Unsigned_	1	FALSE	N7:10	0	0
404	DEV001	RECT1_AI	Discrete	1	FALSE	B23:10/08	0	0
404	DEV001	AI1_MAP_	Unsigned_	1	FALSE	N26:11	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/03	0	0
404	DEV001	RECT1_VC	Discrete	1	FALSE	B23:10/02	0	0
404	DEV001	RECT1_FA	Discrete	1	FALSE	B23:10/00	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/09	0	0
404	DEV001	ANY_ALAF	Discrete	1	FALSE	B20:9/00	0	0
404	DEV001	PRE_DOS	Discrete	1	FALSE	B23:3/03	0	0
404	DEV001	CP_100_E	Discrete	1	FALSE	B23:1/13	0	0
404	DEV001	CP_200_E	Discrete	1	FALSE	B23:1/14	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/11	0	0
404	DEV001	MSG_ERO	Discrete	1	FALSE	B23:1/12	0	0
404	DEV001	YA_700_AI	Discrete	1	FALSE	B23:4/00	0	0
404	DEV001	YA_710_AI	Discrete	1	FALSE	B23:4/02	0	0
404	DEV001	PRE_NO_I	Discrete	1	FALSE	B23:4/04	0	0
404	DEV001	FU_700_AI	Discrete	1	FALSE	B23:5/10	0	0
404	DEV001	AU_700	Discrete	1	FALSE	B23:5/11	0	0
404	DEV001	RACK1_ST	Discrete	1	FALSE	B21:0/01	0	0
404	DEV001	AAH_700	Discrete	1	FALSE	B23:5/13	0	0
404	DEV001	ANY_HYP(	Discrete	1	FALSE	B23:3/01	0	0
404	DEV001	POST_DO	Discrete	1	FALSE	B23:3/04	0	0
404	DEV001	YA_800_AI	Discrete	1	FALSE	B23:4/10	0	0
404	DEV001	YA_810_AI	Discrete	1	FALSE	B23:4/12	0	0
404	DEV001	POST_NO_	Discrete	1	FALSE	B23:4/14	0	0
404	DEV001	FU_800_AI	Discrete	1	FALSE	B23:6/10	0	0
404	DEV001	AU_800	Discrete	1	FALSE	B23:6/11	0	0
404	DEV001	AAL_800	Discrete	1	FALSE	B23:6/12	0	0
404	DEV001	AAH_800	Discrete	1	FALSE	B23:6/13	0	0
404	DEV001	PROC1_CI	Discrete	1	FALSE	B20:16/05	0	0
404	DEV001	HPTK2_LE	Discrete	1	FALSE	B23:6/06	0	0
404	DEV001	AAL_700	Discrete	1	FALSE	B23:5/12	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:46	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:18	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:19	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	VOLTAGE	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	CURRENT	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:20	0	0
404	DEV001	CELL 2 FL	Floating_P	1	FALSE	F31:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:40	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:30	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:45	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:13	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:51	0	0
404	DEV001	ACTUAL F	Floating_P	1	FALSE	F52:3	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:56	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:2	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:3	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:4	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:12	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:13	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F51:2	0	0

404	DEV001	MP_810_S	Unsigned_	1	FALSE	N24:15	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:10	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:14	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:13	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:4	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:3	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:25	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:22	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:23	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:15	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:28	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:14	0	0
404	DEV001	VFD1_SPE	Floating_P	1	FALSE	F35:6	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F52:2	0	0
404	DEV001	VFD2_SPE	Floating_P	1	FALSE	F35:16	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:8	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:9	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:18	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:19	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:29	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:12	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:45	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:24	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:89	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:14	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:55	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:60	0	0
404	DEV001	HPTK1_LE	Floating_P	1	FALSE	F30:10	0	0
404	DEV001	HPTK2_LE	Floating_P	1	FALSE	F30:20	0	0
404	DEV001	RECT1_AM	Floating_P	1	FALSE	F31:16	0	0
404	DEV001	H2_HD100	Floating_P	1	FALSE	F30:70	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:52	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:43	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:39	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:88	0	0
404	DEV001	CELL 2 RA	Floating_P	1	FALSE	F31:38	0	0
404	DEV001	NH3_PMP	Floating_P	1	FALSE	F35:100	0	0
404	DEV001	NH3_PMP2	Floating_P	1	FALSE	F35:110	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:23	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:22	0	0
404	DEV001	CELL 1 FL	Floating_P	1	FALSE	F31:24	0	0
404	DEV001	FLOW OFF	Floating_P	1	FALSE	F31:57	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:85	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:82	0	0
404	DEV001	BRTK1_LE	Floating_P	1	FALSE	F30:80	0	0
404	DEV001	BRTK_SAL	Floating_P	1	FALSE	F30:100	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:41	0	0
404	DEV001	DOSING_S	Floating_P	1	FALSE	F35:22	0	0
404	DEV001	POST_MP_	Floating_P	1	FALSE	F51:29	0	0
404	DEV001	GAIN 1	Floating_P	1	FALSE	F35:47	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:49	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:53	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:55	0	0
404	DEV001	GAIN 2	Floating_P	1	FALSE	F35:57	0	0
404	DEV001	LOW LIMIT	Floating_P	1	FALSE	F35:59	0	0
404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F35:26	0	0

404	DEV001	VFD3_SPE	Floating_P	1	FALSE	F53:2	0	0
404	DEV001	CUSTOME	Floating_P	1	FALSE	F31:50	0	0
404	DEV001	ANALYZEF	Floating_P	1	FALSE	F31:70	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:43	0	0
404	DEV001	RESIDUAL	Floating_P	1	FALSE	F31:71	0	0
404	DEV001	FLOW RAI	Floating_P	1	FALSE	F31:67	0	0
404	DEV001	PUMP STF	Floating_P	1	FALSE	F35:24	0	0
404	DEV001	PUMP CAF	Floating_P	1	FALSE	F35:23	0	0
404	DEV001	GAIN 3	Floating_P	1	FALSE	F35:67	0	0
404	DEV001	LOW LIMI	Floating_P	1	FALSE	F35:69	0	0
404	DEV001	HIGH LIMI	Floating_P	1	FALSE	F35:65	0	0
404	DEV001	MAX TIME	Floating_P	1	FALSE	F35:63	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:28	0	0
404	DEV001	CELL 1 RA	Floating_P	1	FALSE	F31:29	0	0
404	DEV001	DOSING F	Floating_P	1	FALSE	F51:3	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:4	0	0
404	DEV001	MP_710_S	Unsigned_	1	FALSE	N7:28	0	0
404	DEV001	MP_810_S	Unsigned_	1	FALSE	N7:58	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N7:57	0	0
404	DEV001	MP_800_H	Unsigned_	1	FALSE	N7:55	0	0
404	DEV001	MP_810_H	Unsigned_	1	FALSE	N7:56	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:40	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:41	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:1	0	0
404	DEV001	RECT1_VC	Floating_P	1	FALSE	F31:0	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:3	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:44	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:5	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:6	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:7	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.0	0	0
404	DEV001	AO_MAP_(	Unsigned_	1	FALSE	O:4.1	0	0
404	DEV001	PLC_TO_F	Unsigned_	1	FALSE	N9:0	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T41:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:10.PR	0	0
404	DEV001	UDATE TI	Unsigned_	1	FALSE	T42:18.PR	0	0
404	DEV001	AI1_MAP_(	Unsigned_	1	FALSE	N26:2	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:14	0	0
404	DEV001	BLW_ROT	Unsigned_	1	FALSE	N24:100	0	0
404	DEV001	BLW_600_	Unsigned_	1	FALSE	N24:10	0	0
404	DEV001	BLW_610_	Unsigned_	1	FALSE	N24:11	0	0
404	DEV001	DI_0_16	Discrete	1	FALSE	I:0/16	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N7:11	0	0
404	DEV001	PRE_DOS	Unsigned_	1	FALSE	N24:20	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N24:21	0	0
404	DEV001	POST_DO	Unsigned_	1	FALSE	N7:41	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:40	0	0
404	DEV001	POST_RE	Unsigned_	1	FALSE	N7:61	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:13	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:46	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:16	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:12	0	0
404	DEV001	PRE_RES_	Unsigned_	1	FALSE	N7:31	0	0
404	DEV001	MP_700_S	Unsigned_	1	FALSE	N7:27	0	0
404	DEV001	MP_700_H	Unsigned_	1	FALSE	N7:25	0	0

404	DEV001	MP_710_H	Unsigned_	1	FALSE	N7:26	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:45	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:42	0	0
404	DEV001	POST_PID	Unsigned_	1	FALSE	N7:43	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:79	0	0
404	DEV001	PRE_PID_	Unsigned_	1	FALSE	N7:15	0	0
404	DEV001	QR_710	Floating_P	1	FALSE	F30:3	0	0
404	DEV001	MP_800_S	Unsigned_	1	FALSE	N24:14	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:58	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:59	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:60	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:68	0	0
404	DEV001	AI_800_SC	Floating_P	1	FALSE	F30:69	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:102	0	0
404	DEV001	BRTK1_SA	Floating_P	1	FALSE	F30:105	0	0
404	DEV001	BLW1_QR	Floating_P	1	FALSE	F30:0	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:49	0	0
404	DEV001	QR_700	Floating_P	1	FALSE	F30:2	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:48	0	0
404	DEV001	QR_800	Floating_P	1	FALSE	F30:4	0	0
404	DEV001	QR_810	Floating_P	1	FALSE	F30:5	0	0
404	DEV001	AAL_700_S	Floating_P	1	FALSE	F30:41	0	0
404	DEV001	AAH_700_	Floating_P	1	FALSE	F30:42	0	0
404	DEV001	PRE_MP_(	Floating_P	1	FALSE	F51:9	0	0
404	DEV001	PRE_MP_S	Floating_P	1	FALSE	F51:10	0	0
404	DEV001	PRE_FP_C	Floating_P	1	FALSE	F51:14	0	0
404	DEV001	AAH_800_	Floating_P	1	FALSE	F30:62	0	0
404	DEV001	AAL_800_S	Floating_P	1	FALSE	F30:61	0	0
404	DEV001	POST_FP_	Floating_P	1	FALSE	F51:34	0	0
404	DEV001	BLW2_QR	Floating_P	1	FALSE	F30:1	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:139	0	0
404	DEV001	PROCESS	Unsigned_	1	FALSE	N24:51	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:110	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:118	0	0
404	DEV001	SP_AI_M1	Floating_P	1	FALSE	F30:119	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:108	0	0
404	DEV001	BRTK_SAI	Floating_P	1	FALSE	F30:109	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:120	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:130	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:128	0	0
404	DEV001	FI_800_SC	Floating_P	1	FALSE	F30:50	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:129	0	0
404	DEV001	H2_LEVEL	Floating_P	1	FALSE	F30:78	0	0
404	DEV001	ECR_100_	Floating_P	1	FALSE	F30:6	0	0
404	DEV001	RECT2_VC	Floating_P	1	FALSE	F32:0	0	0
404	DEV001	RECT2_AM	Floating_P	1	FALSE	F32:10	0	0
404	DEV001	ECR_200_	Floating_P	1	FALSE	F30:7	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:30	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:83	0	0
404	DEV001	BRTK1_BF	Floating_P	1	FALSE	F30:84	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:38	0	0
404	DEV001	FI_700_SC	Floating_P	1	FALSE	F30:39	0	0
404	DEV001	AI_700_SC	Floating_P	1	FALSE	F30:40	0	0
404	DEV001	SP_AI_M2	Floating_P	1	FALSE	F30:138	0	0

CITY OF GRAND JUNCTION

WTP FILTER UPGRADES

PLC DRAWING SET

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
F				
E				
D				
C				
B				
A				

GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DRAWING INDEX

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017
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X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D01 TITLE.dwg [Thursday, April 06, 2017]

WIRE COLOR CODING

D.C. CONTROL CIRCUITS

1) +12V - BLUE
2) -12V - BLUE WITH WHITE STRIPE
3) +24V - BLUE
4) -24V - VIOLET

A.C. CONTROL CIRCUITS

1) 24V PWR - ORANGE
2) 24V NEUTRAL - GRAY
3) 120V PWR UNPROTECTED - BLACK
4) 120 PWR PROTECTED - RED
5) 120 NEUTRAL - WHITE
6) FOREIGN PWR TO PANEL - YELLOW

A.C. POWER
480V/277V

1) PHASE A - BROWN
2) PHASE B - ORANGE
3) PHASE C - YELLOW
4) EQUIPMENT GROUND - GREEN

240/120V, 208/120V

1) PHASE A - BLACK
2) PHASE B - RED
3) PHASE C - BLUE
4) EQUIPMENT GROUND - GREEN

WIRE SIZE CODE	
WIRE TYPE	WIRE SIZE
PLC INPUT/OUTPUT	#16 AWG
AC & DC CONTROL WIRING	#14 AWG
120 VAC GENERAL PURPOSE	#14 AWG
DC ANALOG SIGNALS	#18 TSP

GENERAL NOTES
ALL TERMINALS WITH THE SAME LABEL ARE JUMPERED TOGETHER.
WIRES WITHOUT A LABEL SHALL BE LABELED WITH THE SAME LEGEND AS THE TERMINAL BLOCK.
ALL FIELD WIRE SHALL BE COPPER WIRE, AND TORQUED PER MANUFACTURER RECOMMENDATIONS.
CONDUIT FITTINGS, HUBS OR ANY OTHER PENETRATIONS SHALL BE UL LISTED TO MAINTAIN THE ENVIROMENTAL RATING OF THE ENCLOSURE PROVIDED.
DANGER,MULTIPLE POWER SUPPLIES RISK OF ELECTRIC SHOCK, BURN OR EXPLOSION. MORE THAN ONE DISCONNECT SWITCH MAY BE REQUIRED TO DE-ENERGIZE THE EQUIPMENT BEFORE SERVICING.
* EQUIPMENT MOUNTED ON THE DOOR.

FIELD TERMINATIONS TORQUE TABLE			
EQUIPMENT TYPE	TORQUE RATING	EQUIPMENT TYPE	TORQUE RATING
FIELD TERMINAL BLOCKS	5 - 7 LB/IN²	CUTLER HAMMER PILOT DEVICES	12 LB/IN²
GROUND BAR	20 LB/IN²	RED LION DISPLAY	4.5 LB/IN²
QOU CIRCUIT BREAKER	45 LB/IN²	ALLEN BRADLEY DIGITAL DISPLAYS	6-8 LB/IN²
MERLIN GERLIN CIRCUIT BREAKER	22 LB/IN²	ALLEN BRADLEY PILOT DEVICES	5-8 LB/IN²
IDEC RELAYS	9-11 LB/IN²	ALLEN BRADLEY MICROLOGIX	5 LB/IN²
IDEC POWER SUPPLIES	7 LB/IN²	SQUARE D PILOT DEVICES	5-8 LB/IN²
ALLEN BRADLEY COMPACTLOGIX	6 LB/IN²	ALLEN BRADLEY CONTROLOGIX	7-9 LB/IN²
SCHNEIDER ELECTRIC - QUANTUM	10 LB/IN²	SCHNEIDER ELECTRIC - MOMENTUM	4.9 N/M²
SCHNEIDER ELECTRIC - ADVANTYS	2.2 LB/IN²	SCHNEIDER ELECTRIC - M340, MAGELIS, PREMIUM	0.5 N/M²
USE COPPER WIRE ONLY 60° C			

FUSE LIST			
FUSE	AMP	VOLTAGE	PART #
CB1	15A	120VAC	QOU115
F1	2A	120VAC	GMA-2A
F2-F6	1A	120VAC	GMA-1A
F7	2A	120VAC	GMA-2A
F8-F10	1A	24VDC	GMA-1A
F11	2A	24VDC	GMA-2A
F12-F15	1A	24VDC	GMA-1A

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

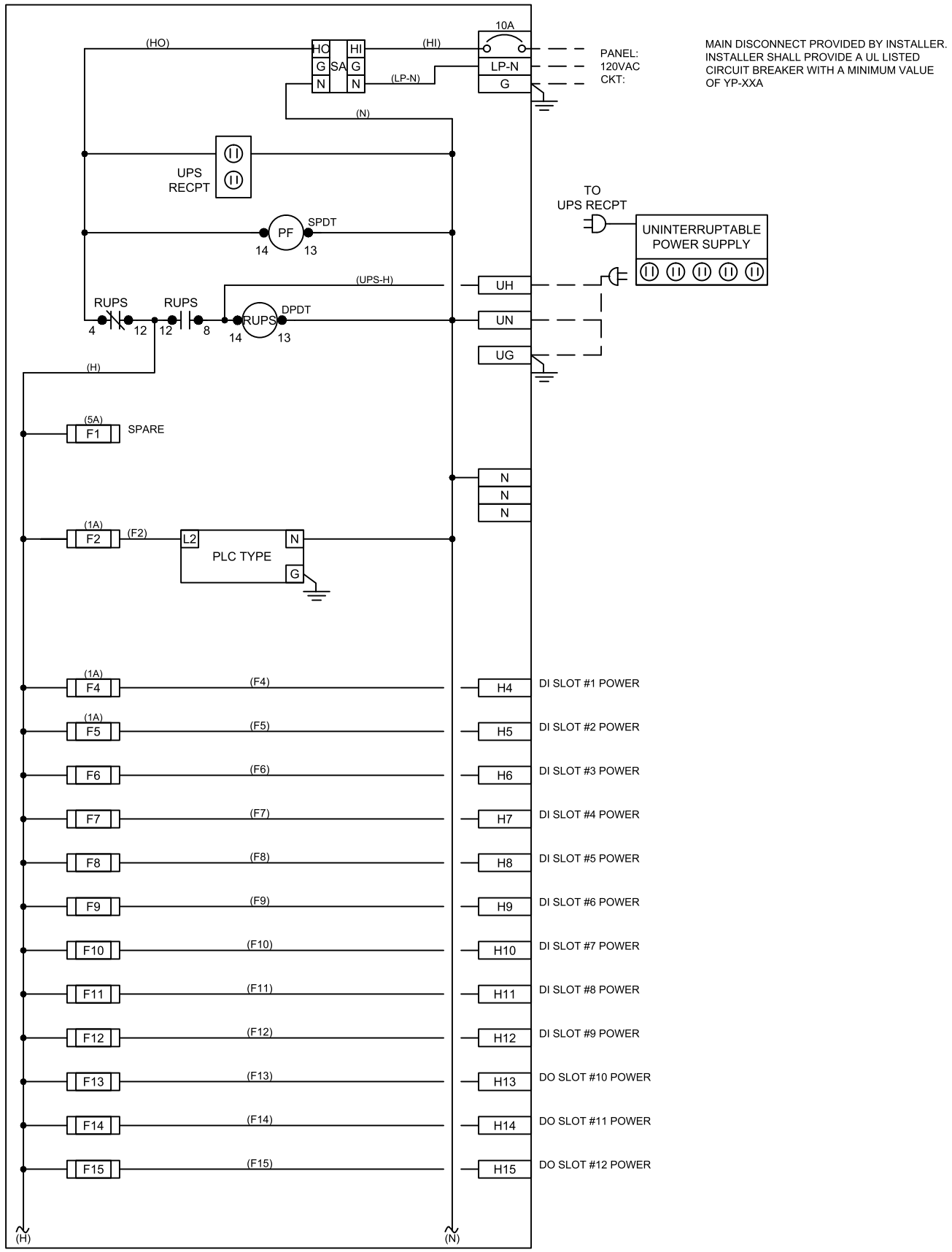
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

LEGEND

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

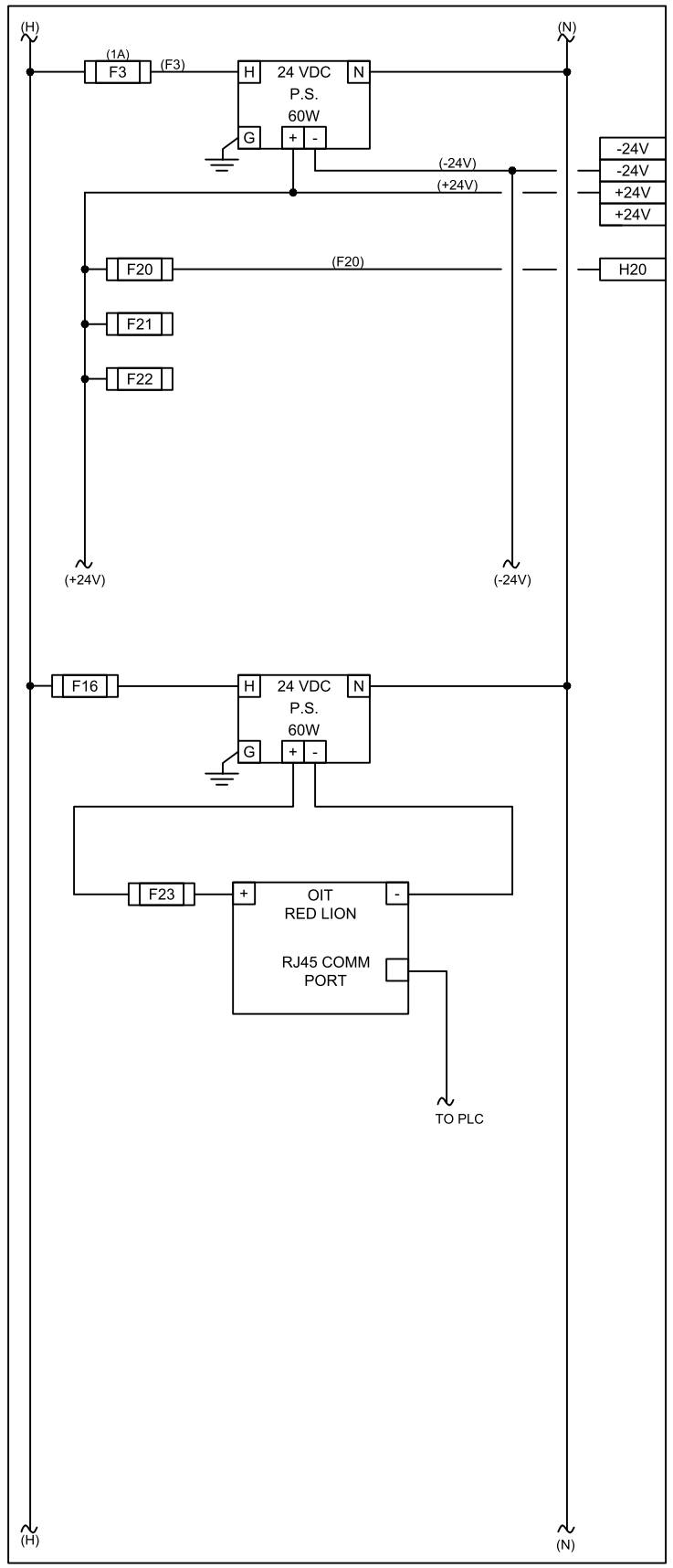
X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D02 LEGEND.dwg [Thursday, April 06, 2017]

MAIN CONTROL PANEL



MAIN DISCONNECT PROVIDED BY INSTALLER.
INSTALLER SHALL PROVIDE A UL LISTED
CIRCUIT BREAKER WITH A MINIMUM VALUE
OF YP-XXA

MAIN CONTROL PANEL



1" IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY	REVISIONS				
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	E				
	D				
PROJECT NUMBER: 16-873	C				
	B				
	A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

POWER DISTRIBUTION

DESIGNED BY:	TFW
DRAWN BY:	TFW
APPROVED BY:	
DATE:	4/2017

03 / 18

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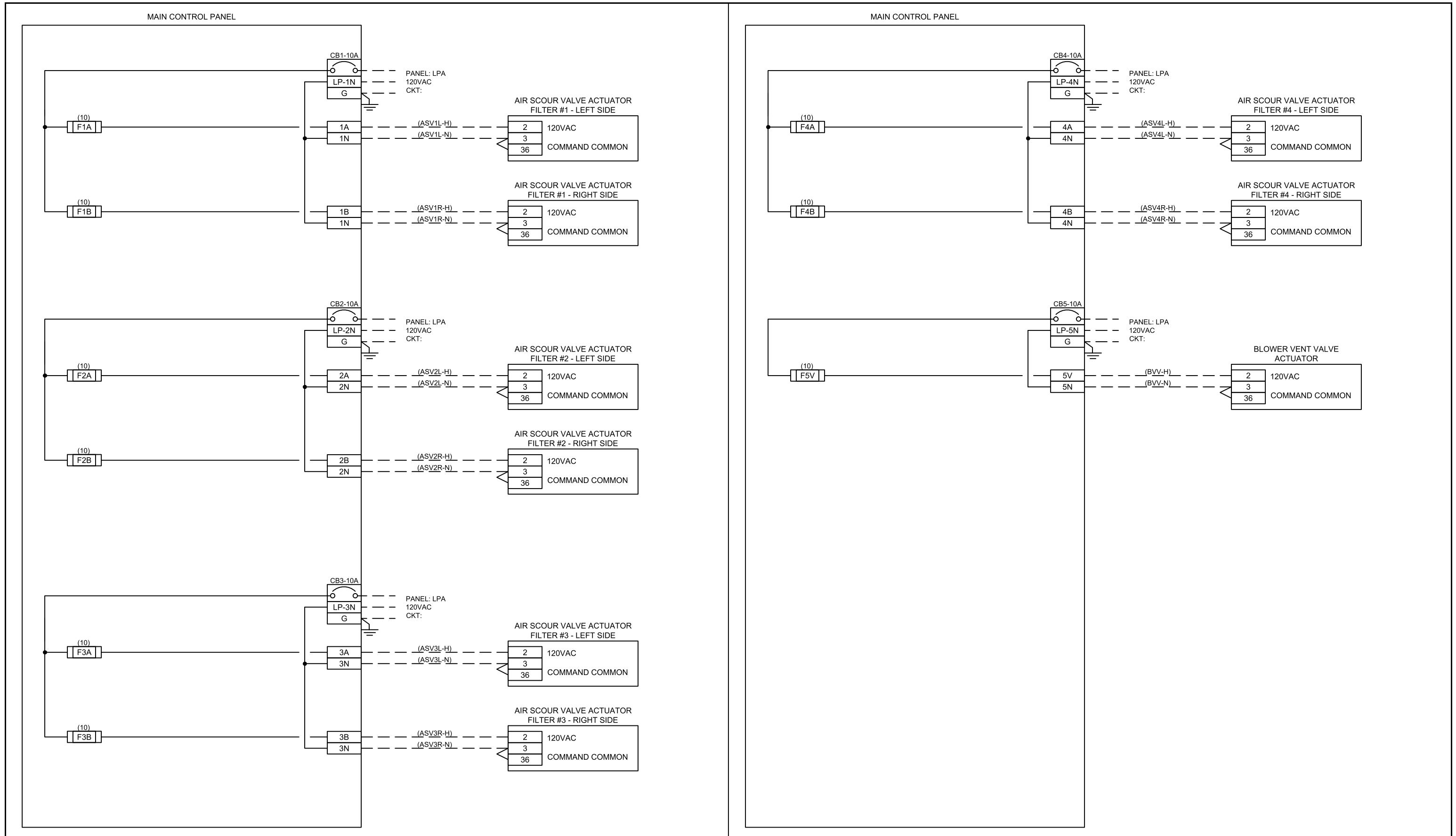

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

AIR SCOUR VALVES
POWER DISTRIBUTION

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

04 / 18

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MAIN CONTROL PANEL - NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 1

IN 0	(1-0)	H4 1-0		SPARE	
IN 1	(1-1)	1-1		SPARE	
IN 2	(1-2)	H4 1-2	(H4-2) (331)	XX XX	CLOSE POSITION INDICATION
IN 3	(1-3)	1-3	(332)	XX XX	OPEN POSITION INDICATION
					FILTER #1 BACKWASH VALVE ACTUATOR
IN 4	(1-4)	N 1-4		SPARE SPARE	
IN 5	(1-5)	H4 1-5	(H4-3)	XX XX	CLOSE POSITION INDICATION
IN 6	(1-6)	1-6	(658)	XX XX	OPEN POSITION INDICATION
					FILTER #1 BW WASTE(DRAIN) VALVE ACTUATOR
IN 7	(1-7)	1-7		SPARE	
IN 8	(1-8)	H4 1-8	(H4-4) (1-8)	12 13	CLOSE POSITION INDICATION
IN 9	(1-9)	1-9	(1-9)	10 11	OPEN POSITION INDICATION
					FILTER #1 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(1-10)	1-10		SPARE	
IN 11	(1-11)	H4 1-11	(H4-5) (663)	XX XX	CLOSE POSITION INDICATION
IN 12	(1-12)	1-12	(662)	XX XX	OPEN POSITION INDICATION
					FILTER #1 LEFT SIDE ISOLATION VALVE VALVE ACTUATOR
IN 13	(1-13)	1-13		SPARE	
IN 14	(1-14)	H4 1-14	(H4-6) (1-14)	XX XX	CLOSE POSITION INDICATION
IN 15	(1-15)	1-15	(1-15)	XX XX	OPEN POSITION INDICATION
					BLOWER VENT VALVE ACTUATOR
* AC COM		N			
* AC COM					

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 2

IN 0	(2-0)	H5 2-0	(2-0)	105	IN AUTO
					COMPRESSOR #1 HOA PANEL
IN 1	(2-1)	2-1	(2-1)	107	IN AUTO
					COMPRESSOR #2 HOA PANEL
IN 2	(2-2)	H5 2-2	(H5-2) (671)	XX XX	CLOSE POSITION INDICATION
IN 3	(2-3)	2-3	(670)	XX XX	OPEN POSITION INDICATION
					FILTER #1 RIGHT SIDE ISOLATION VALVE ACTUATOR
		N		SPARE	
IN 4	(2-4)	2-4		SPARE	
IN 5	(2-5)	H5 2-5	(H5-3) (650)	XX XX	CLOSE POSITION INDICATION
IN 6	(2-6)	2-6		XX XX	OPEN POSITION INDICATION
					FILTER #1 INFLUENT VALVE ACTUATOR
IN 7	(2-7)	2-7		SPARE	
IN 8	(2-8)	H5 2-8	(H5-4) (2-8)	12 13	CLOSE POSITION INDICATION
IN 9	(2-9)	2-9	(2-9)	10 11	OPEN POSITION INDICATION
					FILTER #1 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(2-10)	2-10		SPARE	
IN 11	(2-11)	H5 2-11	(H5-5)	XX XX	CLOSE POSITION INDICATION
IN 12	(2-12)	2-12	(654)	XX XX	OPEN POSITION INDICATION
					FILTER #1 EFFLUENT VALVE ACTUATOR
IN 13	(2-13)	2-13	(2-13)	101	IN AUTO
					PUMP #1 HOA PANEL
IN 14	(2-14)	H5 2-14	(278) (2-14)	XX XX	RUN STATUS
					MCC BACKWASH PUMP #1
IN 15	(2-15)	R1 SPDT 14 13 N 2-15		SPARE	
		H5			
		R1 9 1			
		2-14A		SPARE	
* AC COM		N			
* AC COM					

* COMMONS ARE CONNECTED INTERNALLY

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

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GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 1 & 2

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

05 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D05 DI Slot 1 & 2.dwg [Thursday, April 06, 2017]

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 3

IN 0	(3-0)	H6 3-0	SPARE		
IN 1	(3-1)	3-1	SPARE		
IN 2	(3-2)	3-2	XX XX	CLOSE POSITION INDICATION	FILTER #2 BACKWASH VALVE ACTUATOR
IN 3	(3-3)	H6 3-3	(H6-2) (350)	XX XX	OPEN POSITION INDICATION
IN 4	(3-4)	N 3-4	SPARE		
IN 5	(3-5)	3-5	XX XX	CLOSE POSITION INDICATION	FILTER #2 BW WASTE (DRAIN) VALVE ACTUATOR
IN 6	(3-6)	H6 3-6	(H6-3) (659)	XX XX	OPEN POSITION INDICATION
IN 7	(3-7)	3-7	SPARE		
IN 8	(3-8)	H6 3-8	(H6-4) (3-8)	12 13	CLOSE POSITION INDICATION	FILTER #2 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(3-9)	3-9	(3-9)	10 11	OPEN POSITION INDICATION
IN 10	(3-10)	3-10	SPARE		
IN 11	(3-11)	H6 3-11	(H6-5) (665)	XX XX	CLOSE POSITION INDICATION	FILTER #2 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 12	(3-12)	3-12	(664)	XX XX	OPEN POSITION INDICATION
IN 13	(3-13)	3-13	(3-13)	103	IN AUTO	PUMP #2 HOA PANEL
IN 14	(3-14)	H6 3-14	(279) (3-14)	XX XX	RUN STATUS	MCC BACKWASH PUMP #2
IN 15	(3-15)	N 3-15	SPARE		
		H6 3-14A	SPARE		
* AC COM * AC COM		N			

R2 SPDT: 14, 13, N

R2: 9, 1, H6

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 4

IN 0	(4-0)	H7 4-0	SPARE		
IN 1	(4-1)	4-1	SPARE		
IN 2	(4-2)	H7 4-2	(H7-2) (673)	XX XX	CLOSE POSITION INDICATION	FILTER #2 RIGHT SIDE ISOLATION VALVE ACTUATOR
IN 3	(4-3)	4-3	(672)	XX XX	OPEN POSITION INDICATION
		N	SPARE		
IN 4	(4-4)	4-4	SPARE		
IN 5	(4-5)	4-5	XX XX	CLOSE POSITION INDICATION	FILTER #2 INFLUENT VALVE ACTUATOR
IN 6	(4-6)	H7 4-6	(H7-3) (651)	XX XX	OPEN POSITION INDICATION
IN 7	(4-7)	4-7	SPARE		
IN 8	(4-8)	H7 4-8	(H7-4) (4-8)	12 13	CLOSE POSITION INDICATION	FILTER #2 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(4-9)	4-9	(4-9)	10 11	OPEN POSITION INDICATION
IN 10	(4-10)	4-10	SPARE		
IN 11	(4-11)	4-11	XX XX	CLOSE POSITION INDICATION	FILTER #2 EFFLUENT VALVE ACTUATOR
IN 12	(4-12)	H7 4-12	(H7-5) (655)	XX XX	OPEN POSITION INDICATION
IN 13	(4-13)	4-13	SPARE		
IN 14	(4-14)	4-14	SPARE		
IN 15	(4-15)	4-15	SPARE		
* AC COM * AC COM		N			

* COMMONS ARE CONNECTED INTERNALLY

1" IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
E				
D				
C				
B				
A				

GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 3 & 4

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

06 / 18

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MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 5

IN 0	(5-0)	H8 5-0	SPARE	
IN 1	(5-1)	5-1	SPARE	
IN 2	(5-2)	5-2	XX CLOSE POSITION INDICATION	FILTER #3 BACKWASH VALVE ACTUATOR
IN 3	(5-3)	H8 5-3 (H8-2) (368)	XX OPEN POSITION INDICATION	
IN 4	(5-4)	N 5-4	SPARE	
IN 5	(5-5)	H8 5-5 (H8-3)	XX CLOSE POSITION INDICATION	FILTER #3 BW WASTE (DRAIN) VALVE ACTUATOR
IN 6	(5-6)	5-6 (660)	XX OPEN POSITION INDICATION	
IN 7	(5-7)	5-7	SPARE	
IN 8	(5-8)	H8 5-8 (H8-4) (5-8)	12 CLOSE POSITION INDICATION	FILTER #3 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(5-9)	5-9 (5-9)	10 OPEN POSITION INDICATION 11	
IN 10	(5-10)	5-10	SPARE	
IN 11	(5-11)	H8 5-11 (H8-5) (667)	XX CLOSE POSITION INDICATION	FILTER #3 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 12	(5-12)	5-12 (666)	XX OPEN POSITION INDICATION	
IN 13	(5-13)	5-13	SPARE	
IN 14	(5-14)	5-14	SPARE	
IN 15	(5-15)	5-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 6

IN 0	(6-0)	H9 6-0	SPARE	
IN 1	(6-1)	6-1	SPARE	
IN 2	(6-2)	H9 6-2 (H9-2) (675)	XX CLOSE POSITION INDICATION	FILTER #3 RIGHT SIDE ISOLATION VALVE ACTUATOR
IN 3	(6-3)	6-3 (674)	XX OPEN POSITION INDICATION	
		N	SPARE	
IN 4	(6-4)	6-4	SPARE	
IN 5	(6-5)	H9 6-5 (H9-3)	XX CLOSE POSITION INDICATION	FILTER #3 INFLUENT VALVE ACTUATOR
IN 6	(6-6)	6-6 (652)	XX OPEN POSITION INDICATION	
IN 7	(6-7)	6-7	SPARE	
IN 8	(6-8)	H9 6-8 (H9-4) (6-8)	12 CLOSE POSITION INDICATION	FILTER #3 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(6-9)	6-9 (6-9)	10 OPEN POSITION INDICATION 11	
IN 10	(6-10)	6-10	SPARE	
IN 11	(6-11)	H9 6-11 (H9-5)	XX CLOSE POSITION INDICATION	FILTER #3 EFFLUENT VALVE ACTUATOR
IN 12	(6-12)	6-12 (RLY-21)	XX OPEN POSITION INDICATION	
IN 13	(6-13)	6-13	SPARE	
IN 14	(6-14)	6-14	SPARE	
IN 15	(6-15)	6-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 5 & 6

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

07 / 18

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MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 7

IN 0	(7-0)	H10 7-0	SPARE	
IN 1	(7-1)	7-1	SPARE	
IN 2	(7-2)	7-2	(382)	XX CLOSE POSITION INDICATION XX
IN 3	(7-3)	H10 1-3	(H10-2) (386)	XX OPEN POSITION INDICATION XX — FILTER #4 BACKWASH VALVE ACTUATOR
IN 4	(7-4)	N 7-4	SPARE	
IN 5	(7-5)	H10 7-5	(H10-3)	XX CLOSE POSITION INDICATION XX
IN 6	(7-6)	7-6	(661)	XX OPEN POSITION INDICATION XX — FILTER #4 BW WASTE(DRAIN) VALVE ACTUATOR
IN 7	(7-7)	7-7	SPARE	
IN 8	(7-8)	H10 7-8	(H10-4) (7-8)	12 13 CLOSE POSITION INDICATION
IN 9	(7-9)	7-9	(7-9)	10 11 OPEN POSITION INDICATION — FILTER #4 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(7-10)	7-10	SPARE	
IN 11	(7-11)	H10 7-11	(H10-5) (669)	XX CLOSE POSITION INDICATION XX
IN 12	(7-12)	7-12	(668)	XX OPEN POSITION INDICATION XX — FILTER #4 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 13	(7-13)	7-13	SPARE	
IN 14	(7-14)	7-14	SPARE	
IN 15	(7-15)	7-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 8

IN 0	(8-0)	H11 8-0	SPARE	
IN 1	(8-1)	8-1	SPARE	
IN 2	(8-2)	H11 8-2	(H11-2) (677)	XX CLOSE POSITION INDICATION XX
IN 3	(8-3)	8-3	(676)	XX OPEN POSITION INDICATION XX — FILTER #4 RIGHT SIDE ISOLATION VALVE ACTUATOR
		N	SPARE	
IN 4	(8-4)	8-4	SPARE	
IN 5	(8-5)	H11 8-5	(H11-3)	XX CLOSE POSITION INDICATION XX
IN 6	(8-6)	8-6	(653)	XX OPEN POSITION INDICATION XX — FILTER #4 INFLUENT VALVE ACTUATOR
IN 7	(8-7)	8-7	SPARE	
IN 8	(8-8)	H11 8-8	(H11-4) (8-8)	12 13 CLOSE POSITION INDICATION
IN 9	(8-9)	8-9	(8-9)	10 11 OPEN POSITION INDICATION — FILTER #4 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(8-10)	8-10	SPARE	
IN 11	(8-11)	H11 8-11	(H11-5)	XX CLOSE POSITION INDICATION XX
IN 12	(8-12)	8-12	(657)	XX OPEN POSITION INDICATION XX — FILTER #4 EFFLUENT VALVE ACTUATOR
IN 13	(8-13)	8-13	SPARE	
IN 14	(8-14)	8-14	SPARE	
IN 15	(8-15)	8-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

1" — IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
E				
D				
C				
B				
A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

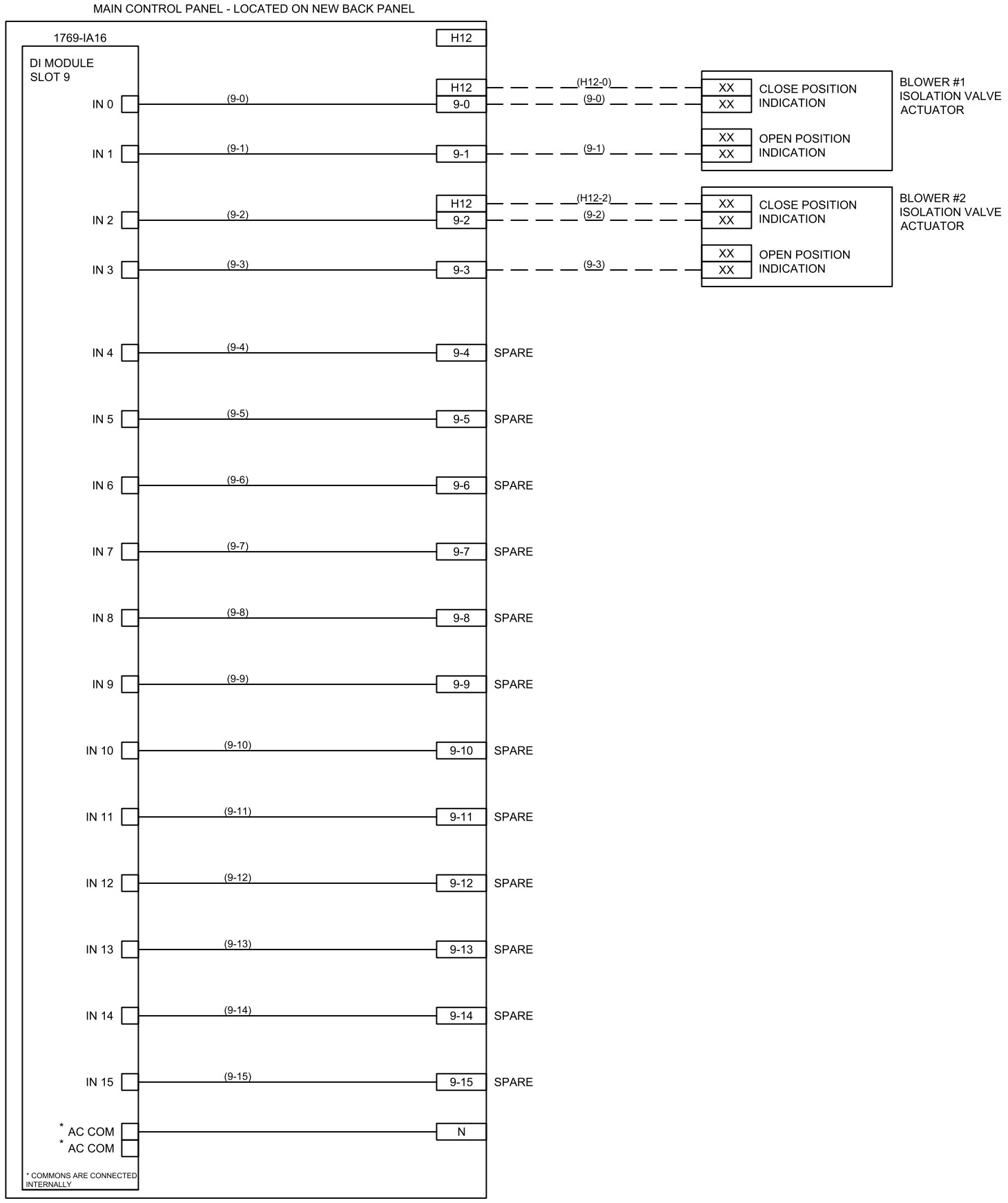
DI SLOT 7 & 8

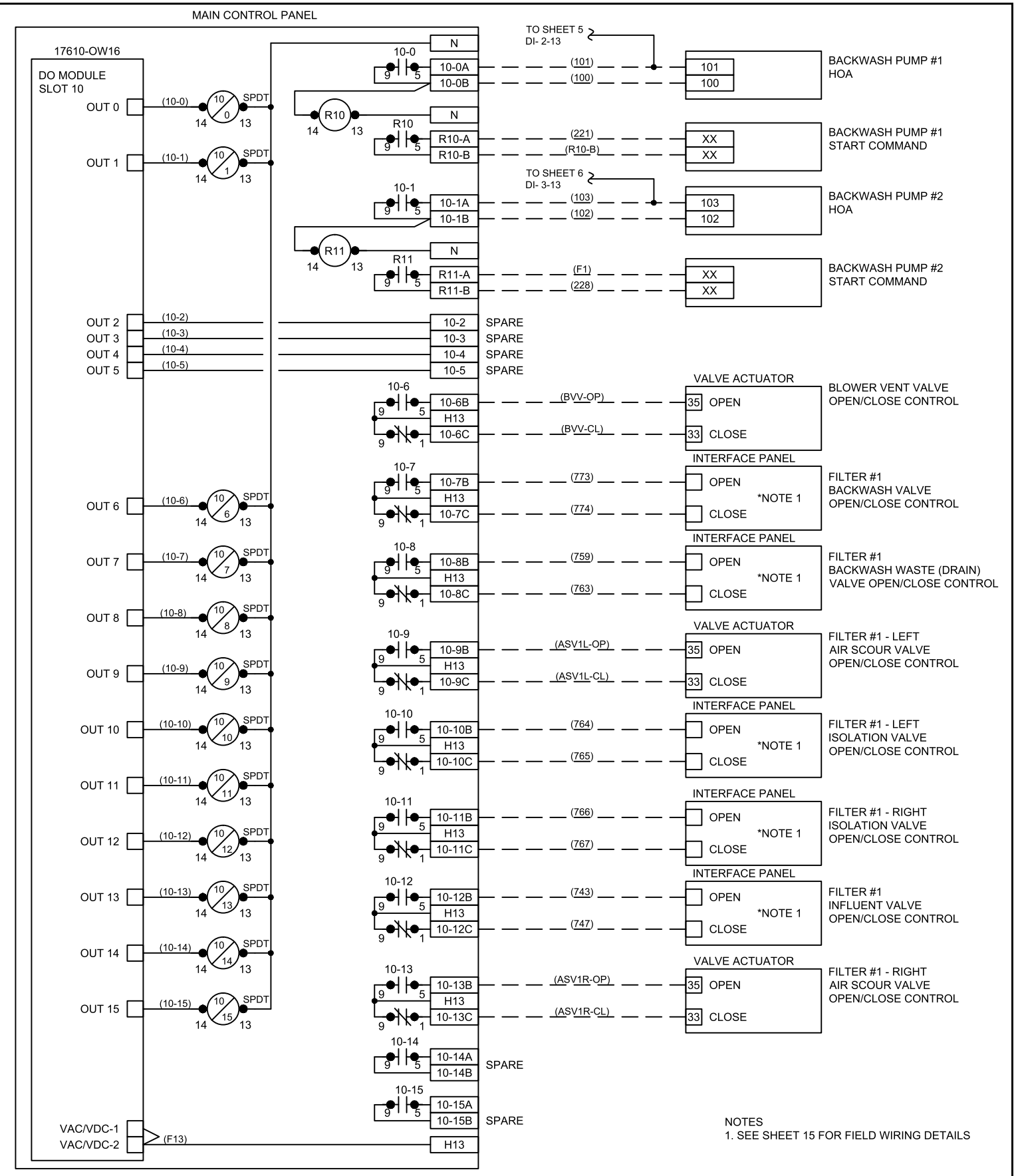
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

08 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D08 DI Slot 7 & 8.dwg [Thursday, April 06, 2017]





1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 9 & DO SLOT 10

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 2/2017

09
18

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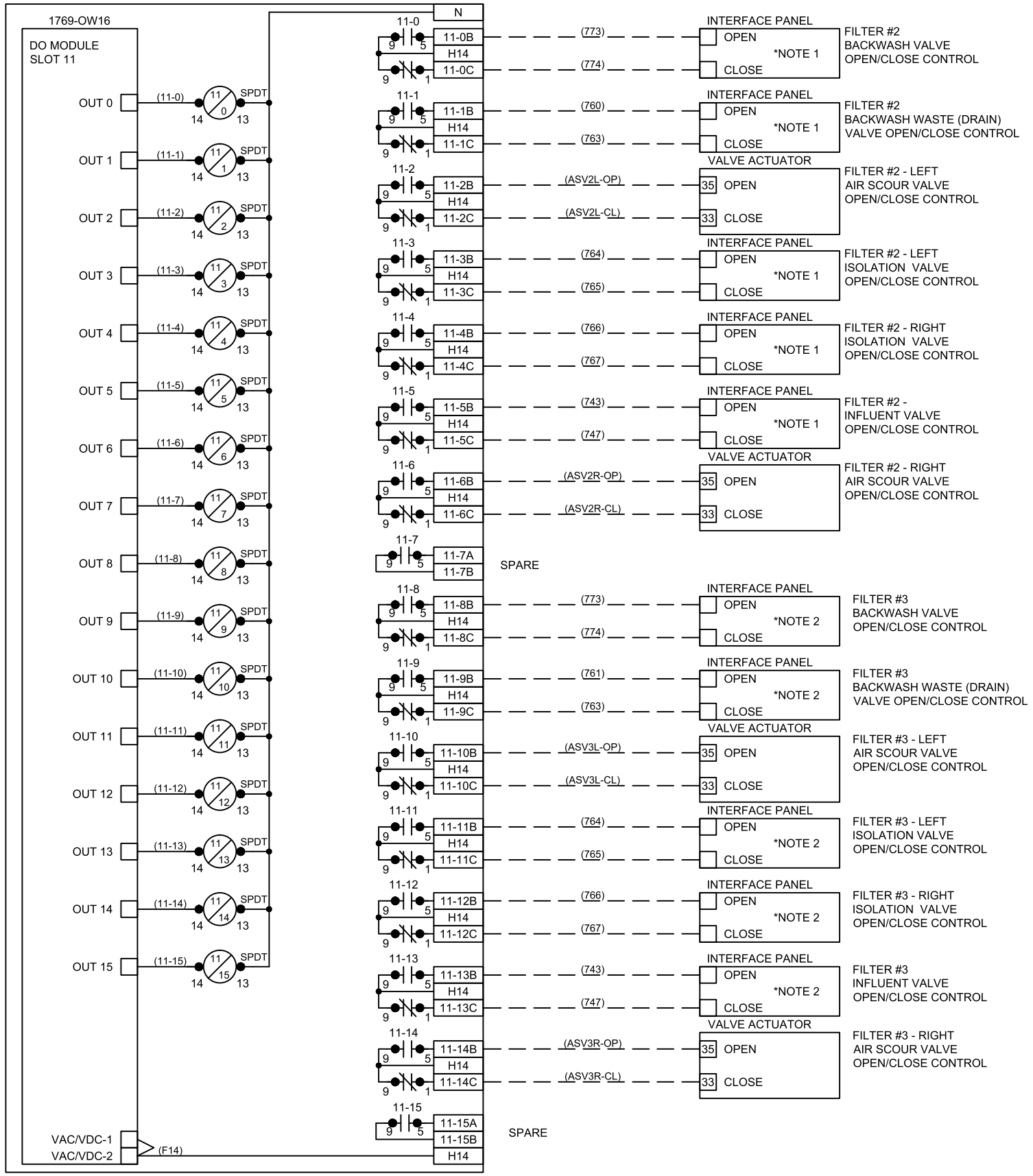

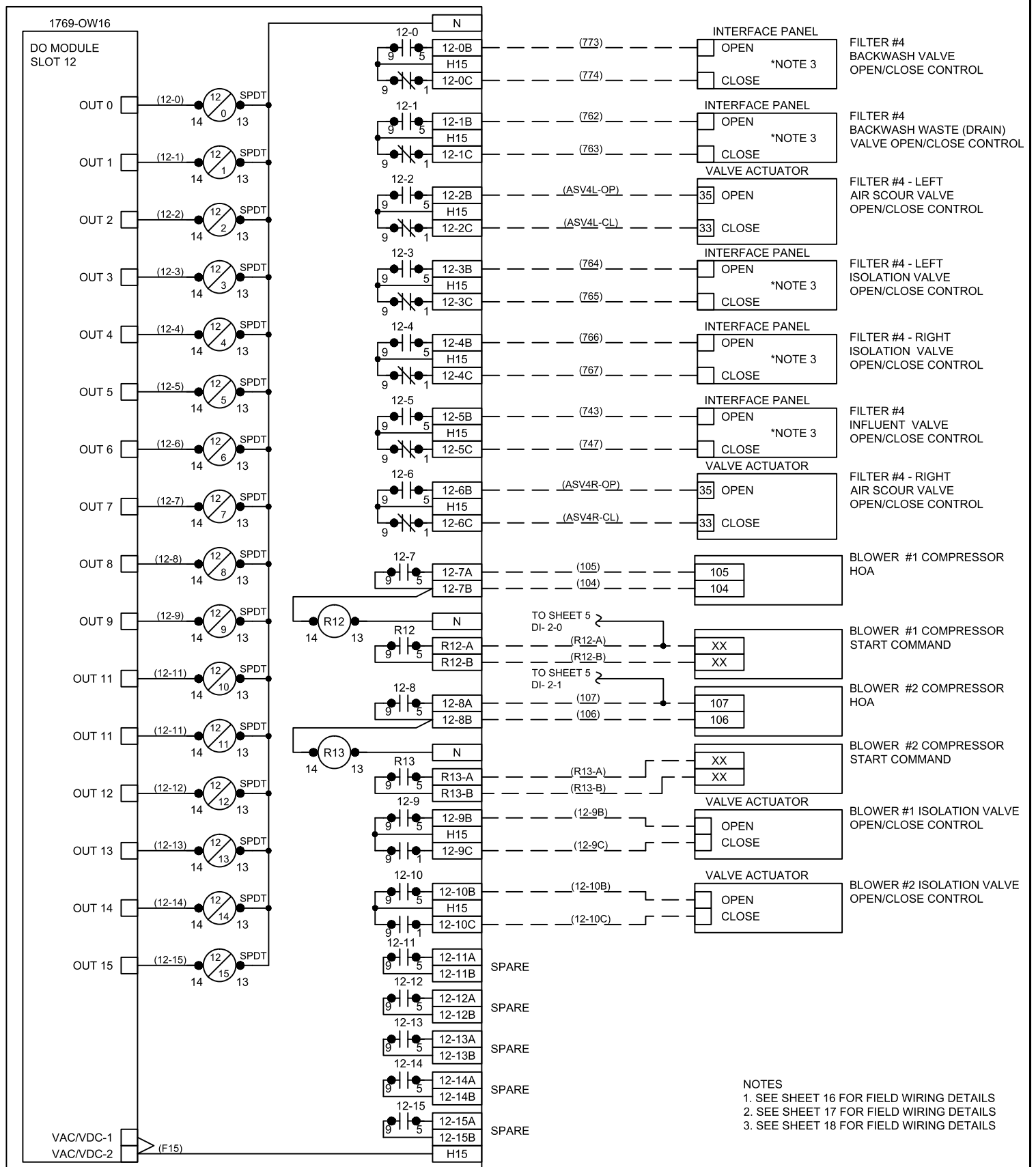

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DO SLOTS 11 & 12

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

10
18

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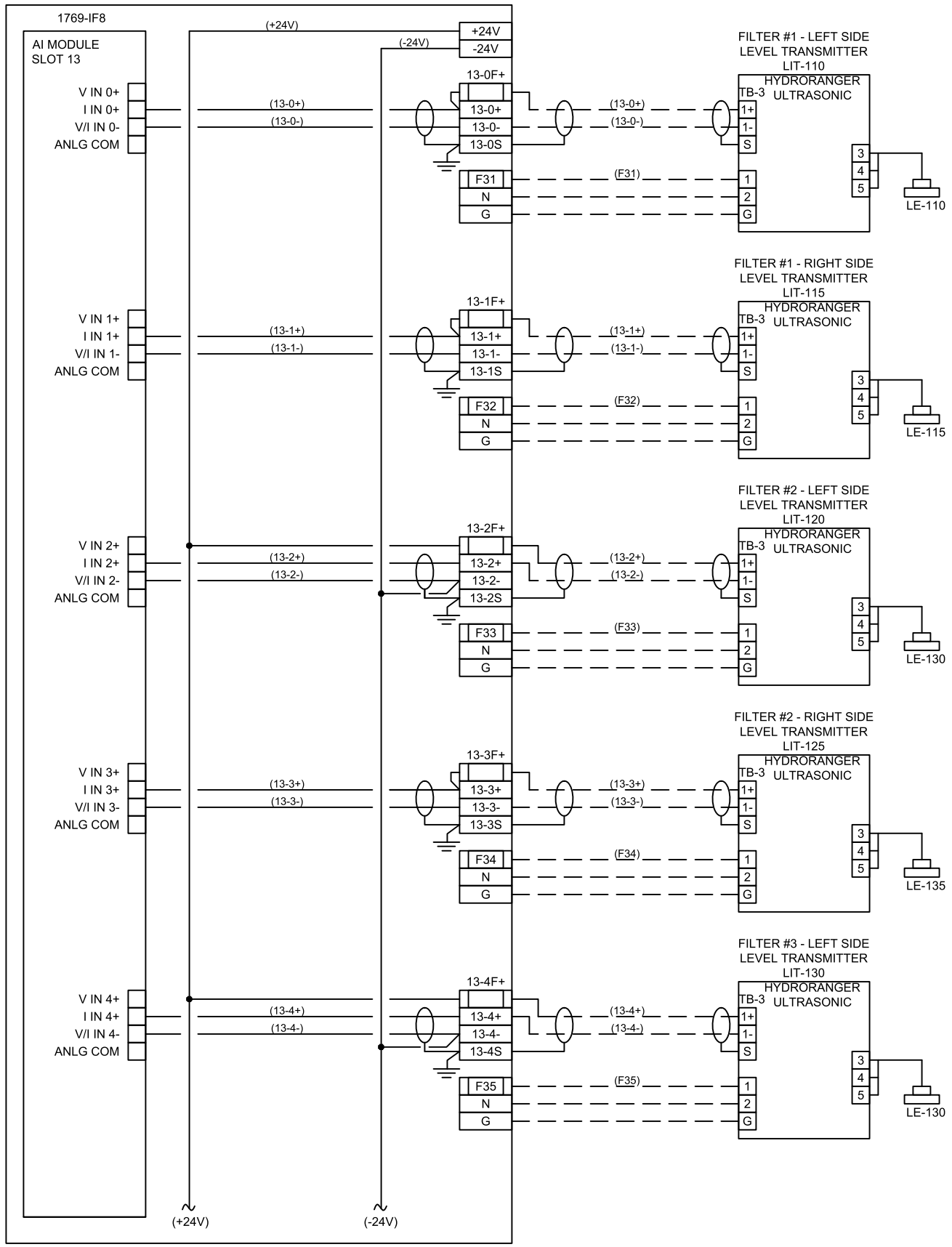

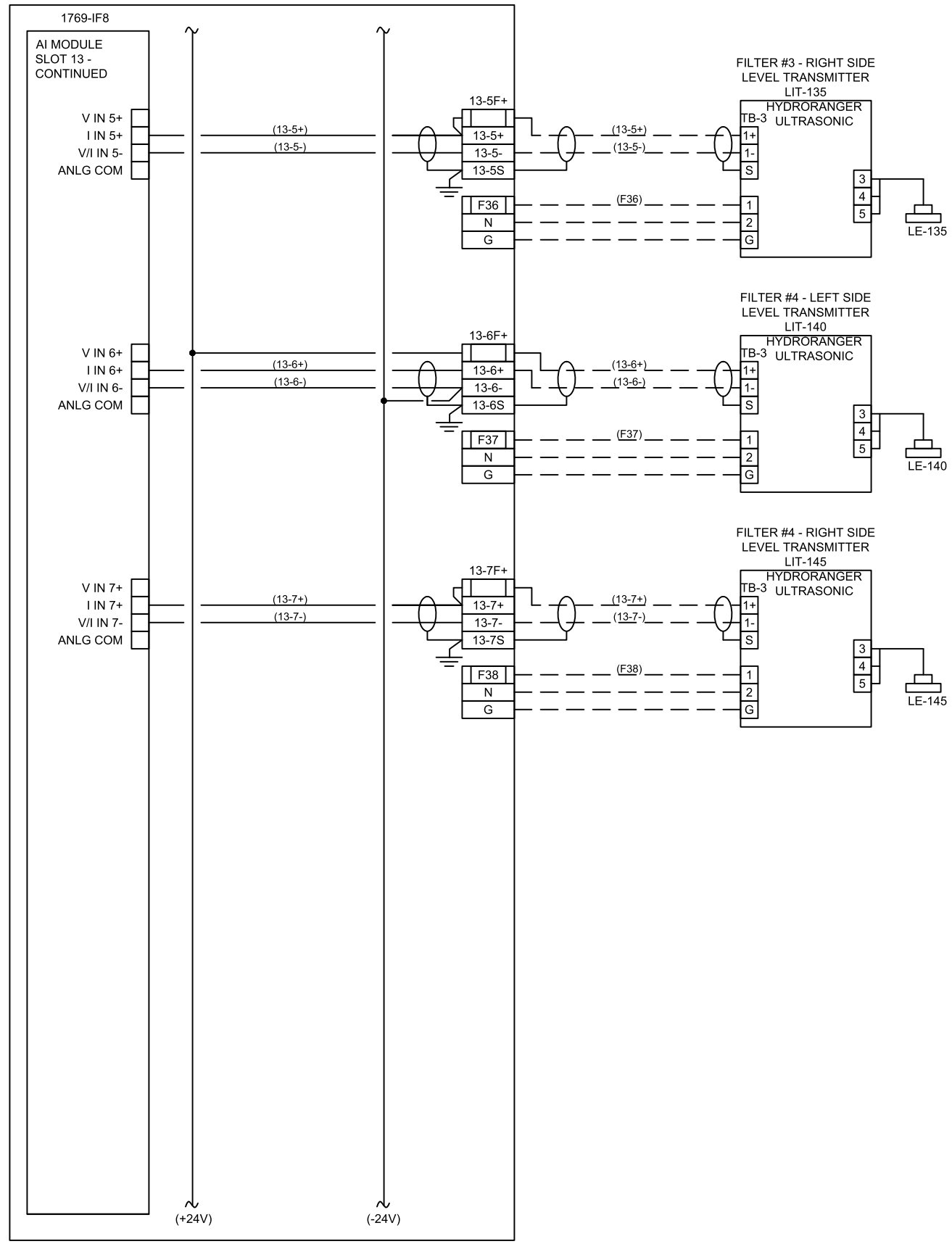

1" — IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

AI SLOT 13

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

11
18

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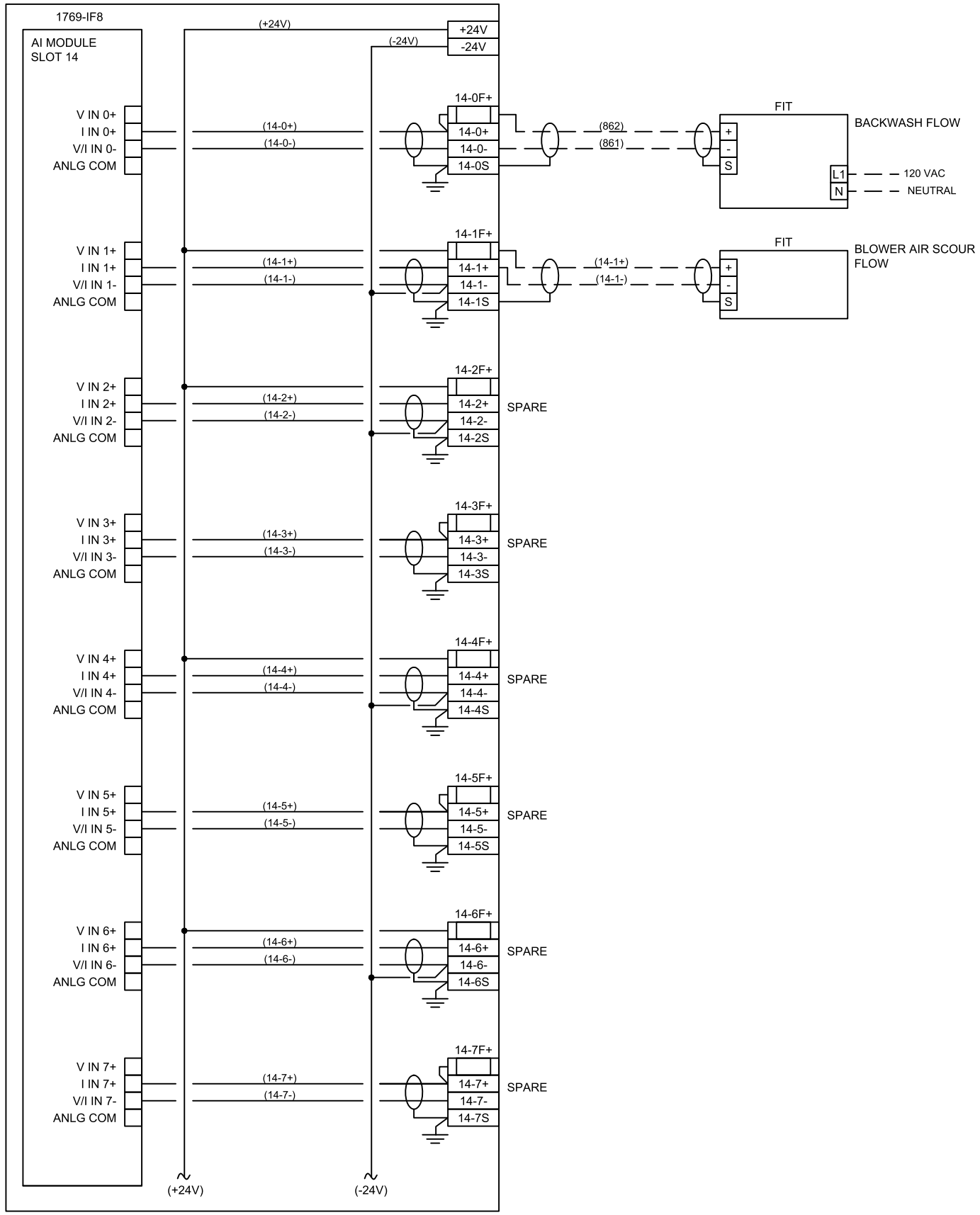

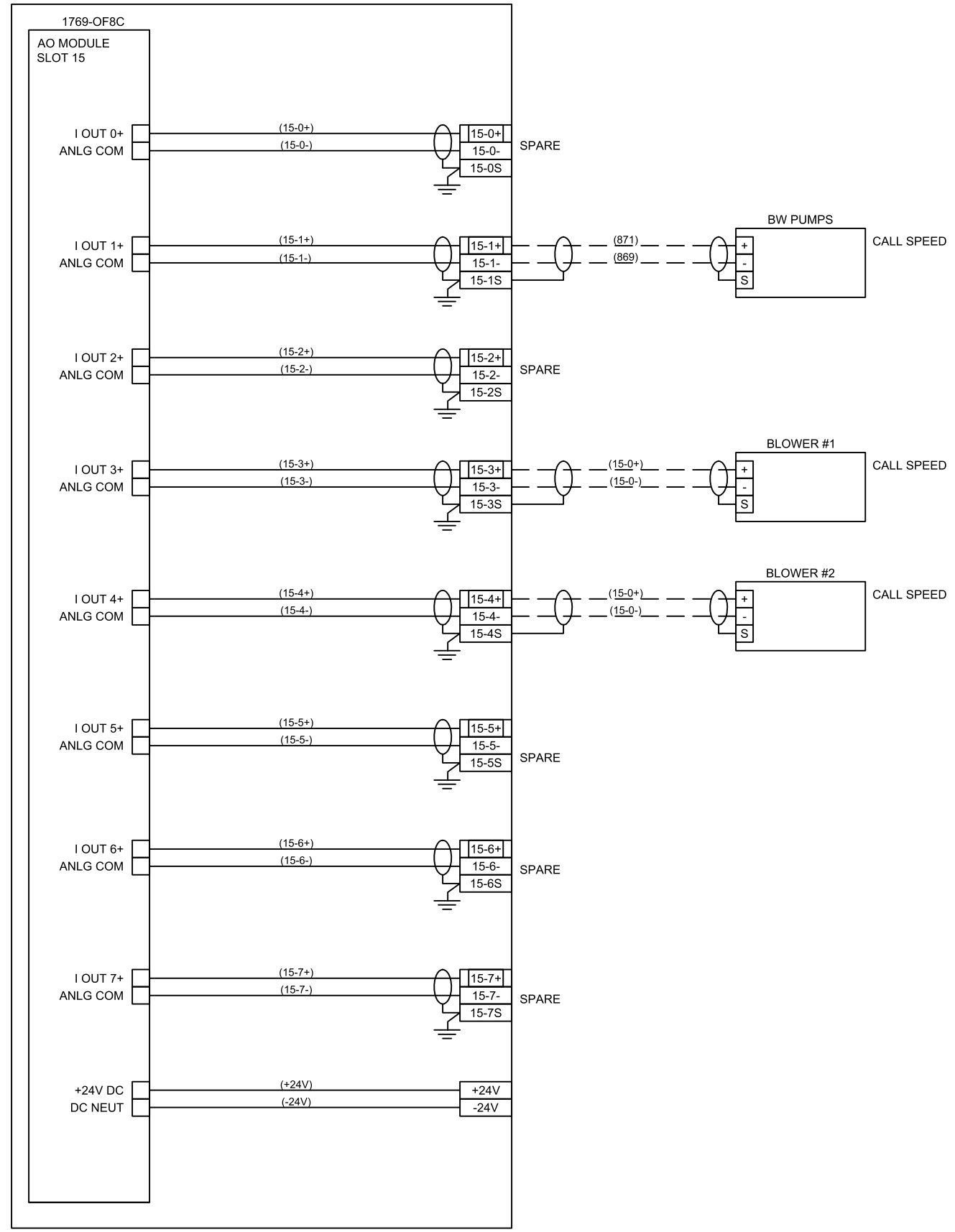

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

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A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

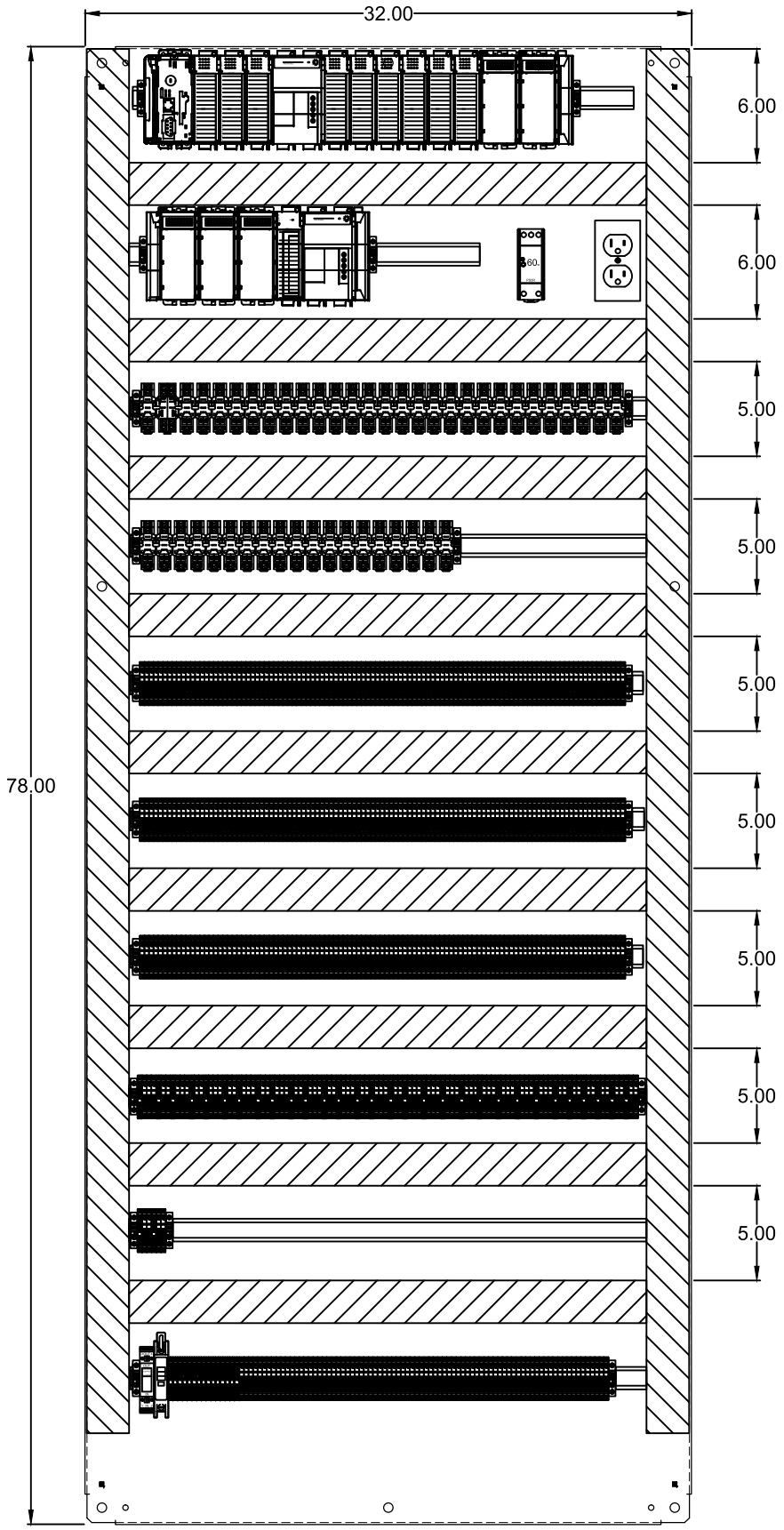
AI SLOT 14 & AO SLOT 15

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

12
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D12 AI Slot 14 & AO Slot 15.dwg [Thursday, April 06, 2017]



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1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTORS

2881 S 31ST aVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

PANEL LAYOUT

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

13
18

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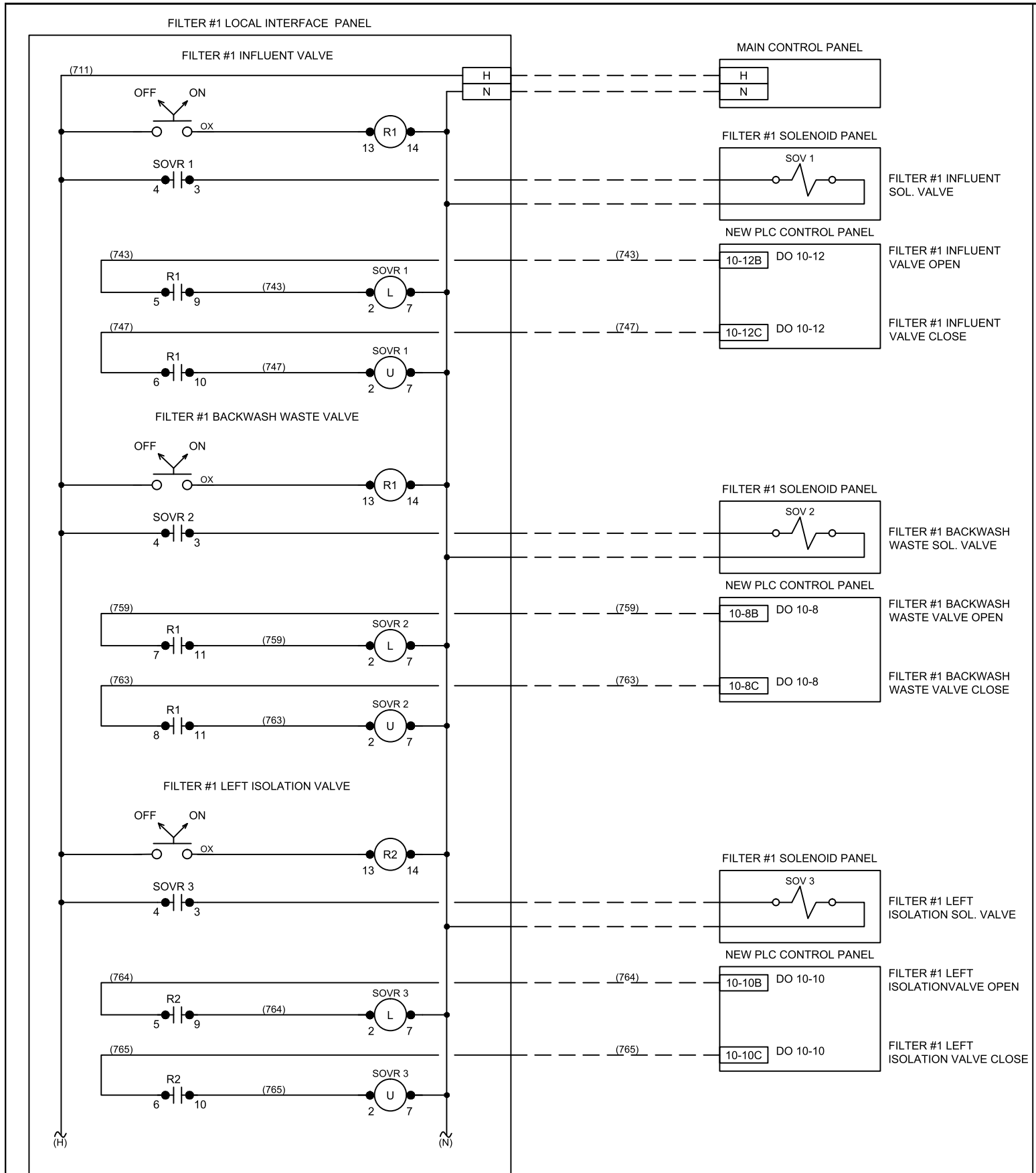

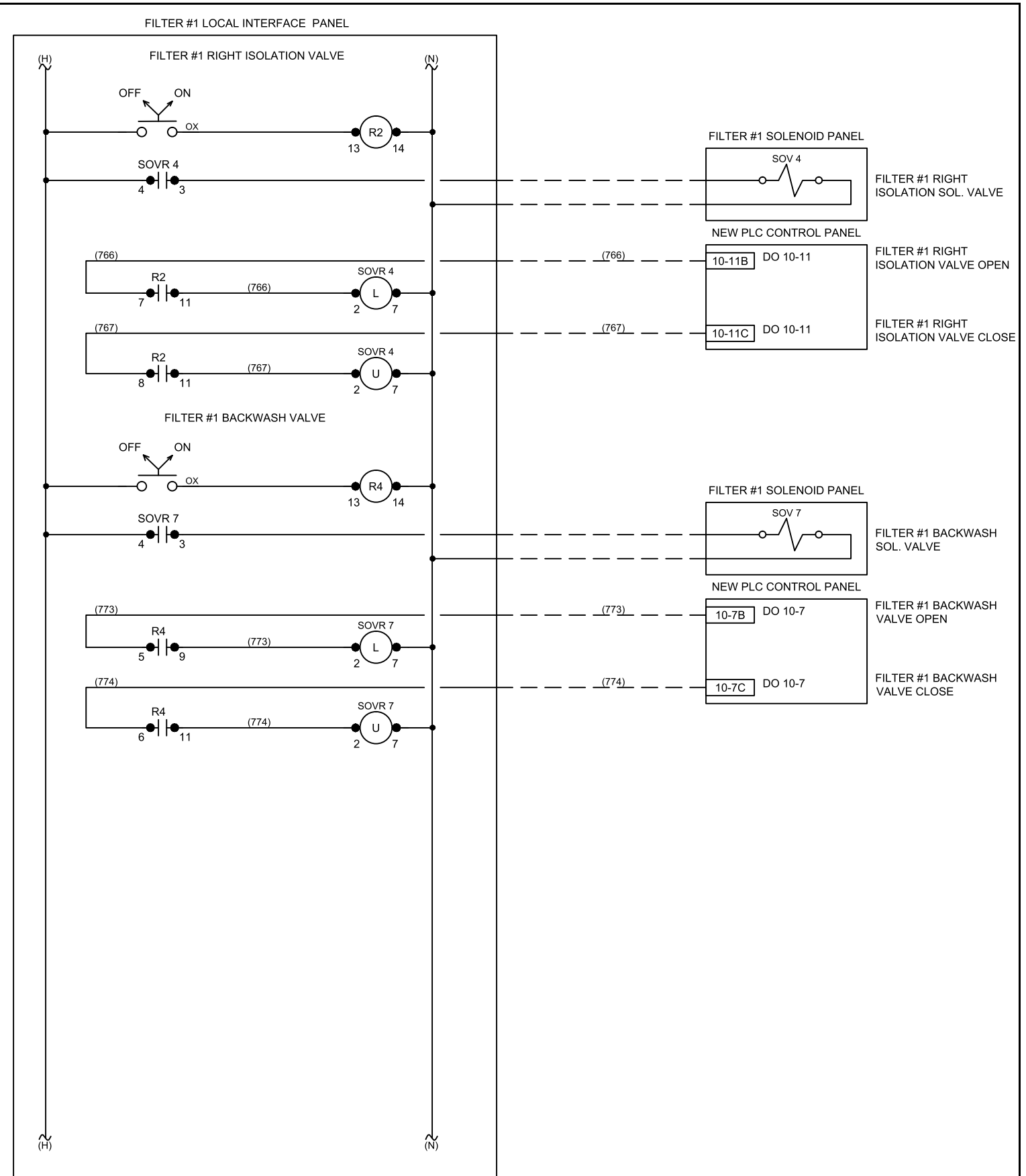

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

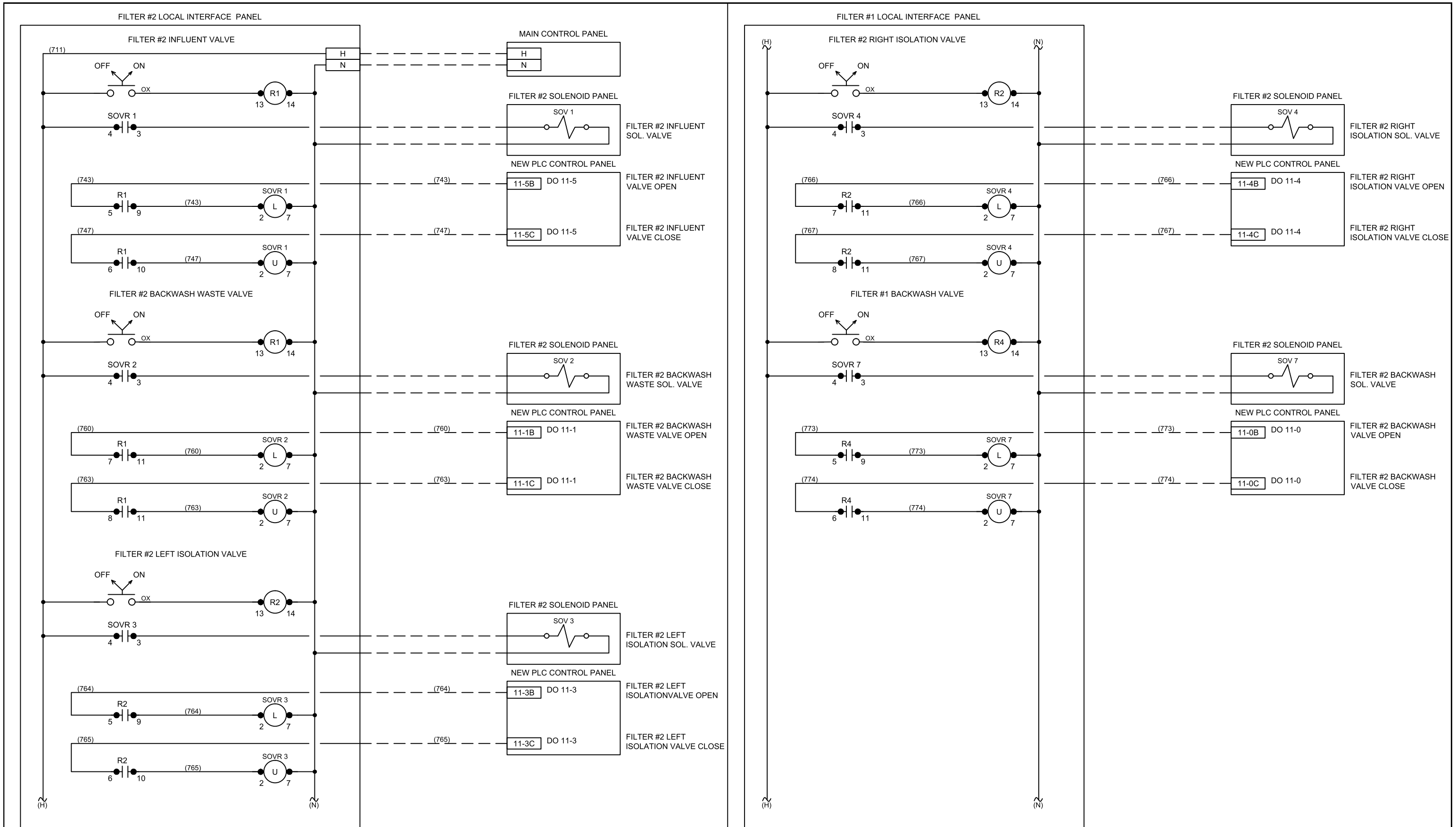
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

15
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D15 Filter #1 Valve Field Wiring.dwg [Thursday, April 06, 2017]



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IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

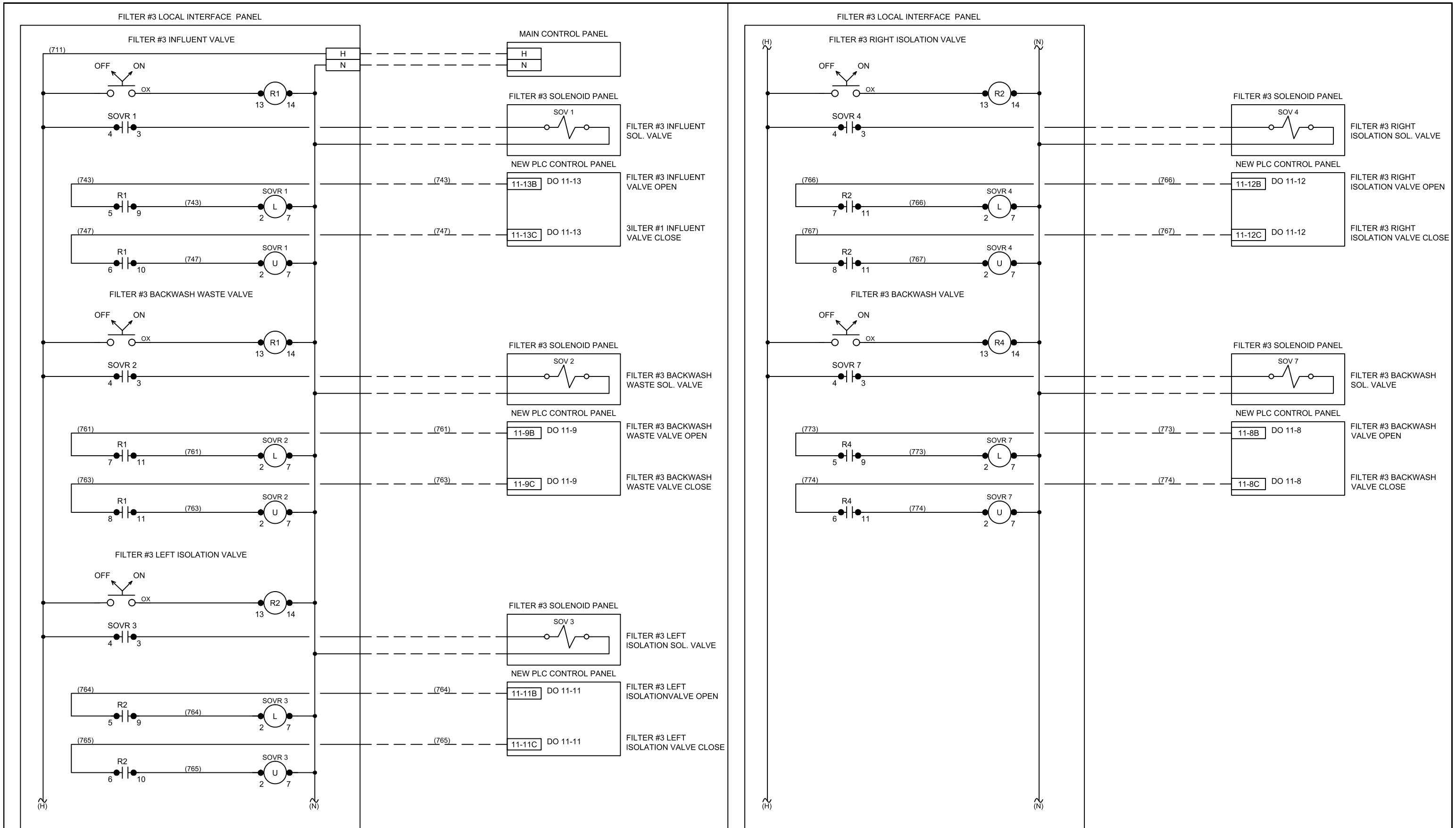
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #2 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

16
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D16 Filter #2 Valve Field Wiring.dwg [Thursday, April 06, 2017]



1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

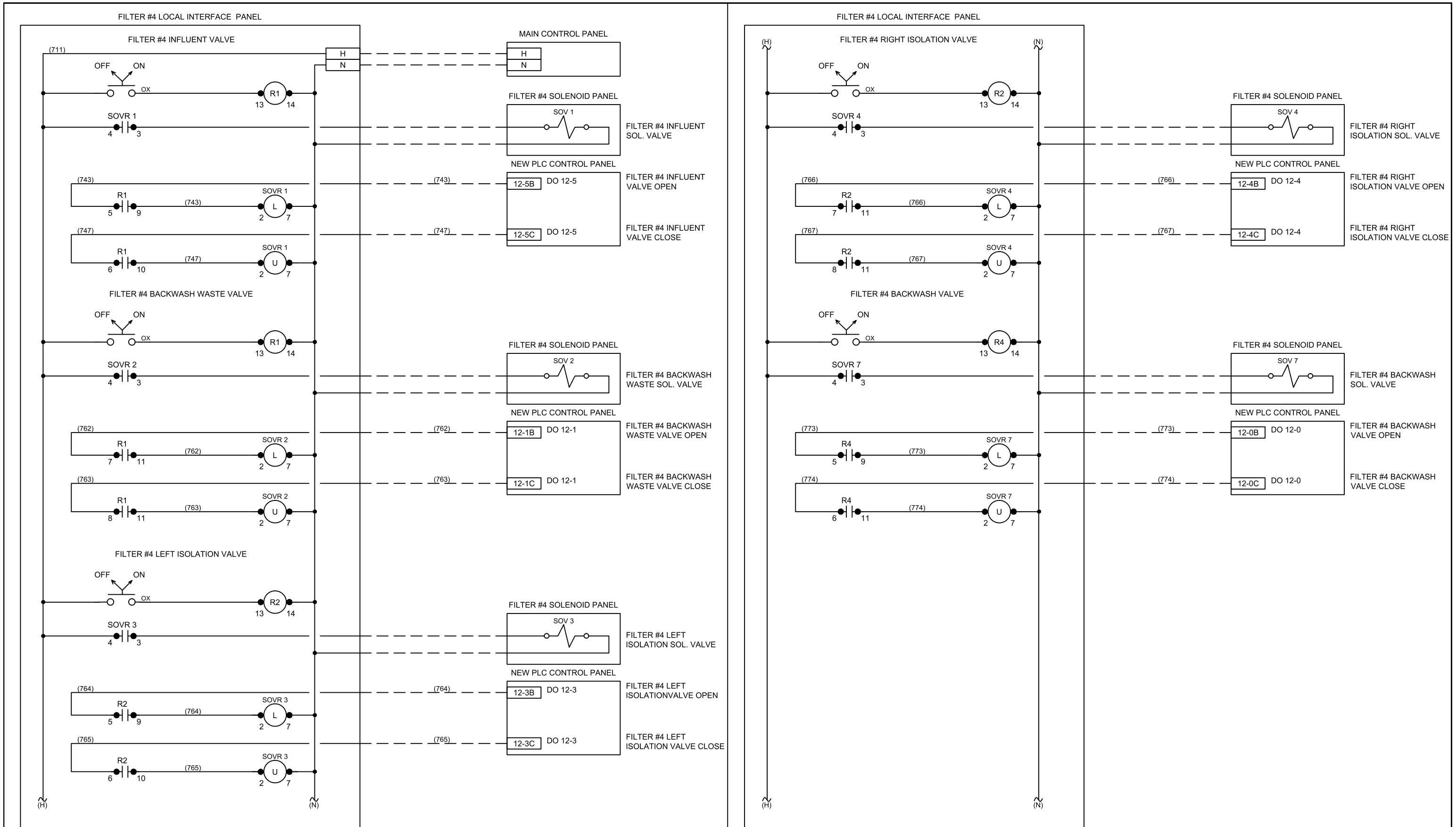
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #3 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

17
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D17 Filter #3 Valve Field Wiring.dwg [Thursday, April 06, 2017]



1"

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PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #4 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

18
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D18 Filter #4 Valve Field Wiring.dwg [Thursday, April 06, 2017]

CITY OF GRAND JUNCTION

WTP FILTER UPGRADES

PLC DRAWING SET

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DRAWING INDEX

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017
01 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D01 TITLE.dwg [Thursday, April 06, 2017]

WIRE COLOR CODING

D.C. CONTROL CIRCUITS

1) +12V - BLUE
2) -12V - BLUE WITH WHITE STRIPE
3) +24V - BLUE
4) -24V - VIOLET

A.C. CONTROL CIRCUITS

1) 24V PWR - ORANGE
2) 24V NEUTRAL - GRAY
3) 120V PWR UNPROTECTED - BLACK
4) 120 PWR PROTECTED - RED
5) 120 NEUTRAL - WHITE
6) FOREIGN PWR TO PANEL - YELLOW

A.C. POWER
480V/277V

1) PHASE A - BROWN
2) PHASE B - ORANGE
3) PHASE C - YELLOW
4) EQUIPMENT GROUND - GREEN

240/120V, 208/120V

1) PHASE A - BLACK
2) PHASE B - RED
3) PHASE C - BLUE
4) EQUIPMENT GROUND - GREEN

WIRE SIZE CODE	
WIRE TYPE	WIRE SIZE
PLC INPUT/OUTPUT	#16 AWG
AC & DC CONTROL WIRING	#14 AWG
120 VAC GENERAL PURPOSE	#14 AWG
DC ANALOG SIGNALS	#18 TSP

GENERAL NOTES
ALL TERMINALS WITH THE SAME LABEL ARE JUMPERED TOGETHER.
WIRES WITHOUT A LABEL SHALL BE LABELED WITH THE SAME LEGEND AS THE TERMINAL BLOCK.
ALL FIELD WIRE SHALL BE COPPER WIRE, AND TORQUED PER MANUFACTURER RECOMMENDATIONS.
CONDUIT FITTINGS, HUBS OR ANY OTHER PENETRATIONS SHALL BE UL LISTED TO MAINTAIN THE ENVIROMENTAL RATING OF THE ENCLOSURE PROVIDED.
DANGER,MULTIPLE POWER SUPPLIES RISK OF ELECTRIC SHOCK, BURN OR EXPLOSION. MORE THAN ONE DISCONNECT SWITCH MAY BE REQUIRED TO DE-ENERGIZE THE EQUIPMENT BEFORE SERVICING.
* EQUIPMENT MOUNTED ON THE DOOR.

FIELD TERMINATIONS TORQUE TABLE			
EQUIPMENT TYPE	TORQUE RATING	EQUIPMENT TYPE	TORQUE RATING
FIELD TERMINAL BLOCKS	5 - 7 LB/IN²	CUTLER HAMMER PILOT DEVICES	12 LB/IN²
GROUND BAR	20 LB/IN²	RED LION DISPLAY	4.5 LB/IN²
QOU CIRCUIT BREAKER	45 LB/IN²	ALLEN BRADLEY DIGITAL DISPLAYS	6-8 LB/IN²
MERLIN GERLIN CIRCUIT BREAKER	22 LB/IN²	ALLEN BRADLEY PILOT DEVICES	5-8 LB/IN²
IDEC RELAYS	9-11 LB/IN²	ALLEN BRADLEY MICROLOGIX	5 LB/IN²
IDEC POWER SUPPLIES	7 LB/IN²	SQUARE D PILOT DEVICES	5-8 LB/IN²
ALLEN BRADLEY COMPACTLOGIX	6 LB/IN²	ALLEN BRADLEY CONTROLOGIX	7-9 LB/IN²
SCHNEIDER ELECTRIC - QUANTUM	10 LB/IN²	SCHNEIDER ELECTRIC - MOMENTUM	4.9 N/M²
SCHNEIDER ELECTRIC - ADVANTYS	2.2 LB/IN²	SCHNEIDER ELECTRIC - M340, MAGELIS, PREMIUM	0.5 N/M²
USE COPPER WIRE ONLY 60° C			

FUSE LIST			
FUSE	AMP	VOLTAGE	PART #
CB1	15A	120VAC	QOU115
F1	2A	120VAC	GMA-2A
F2-F6	1A	120VAC	GMA-1A
F7	2A	120VAC	GMA-2A
F8-F10	1A	24VDC	GMA-1A
F11	2A	24VDC	GMA-2A
F12-F15	1A	24VDC	GMA-1A

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS				
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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

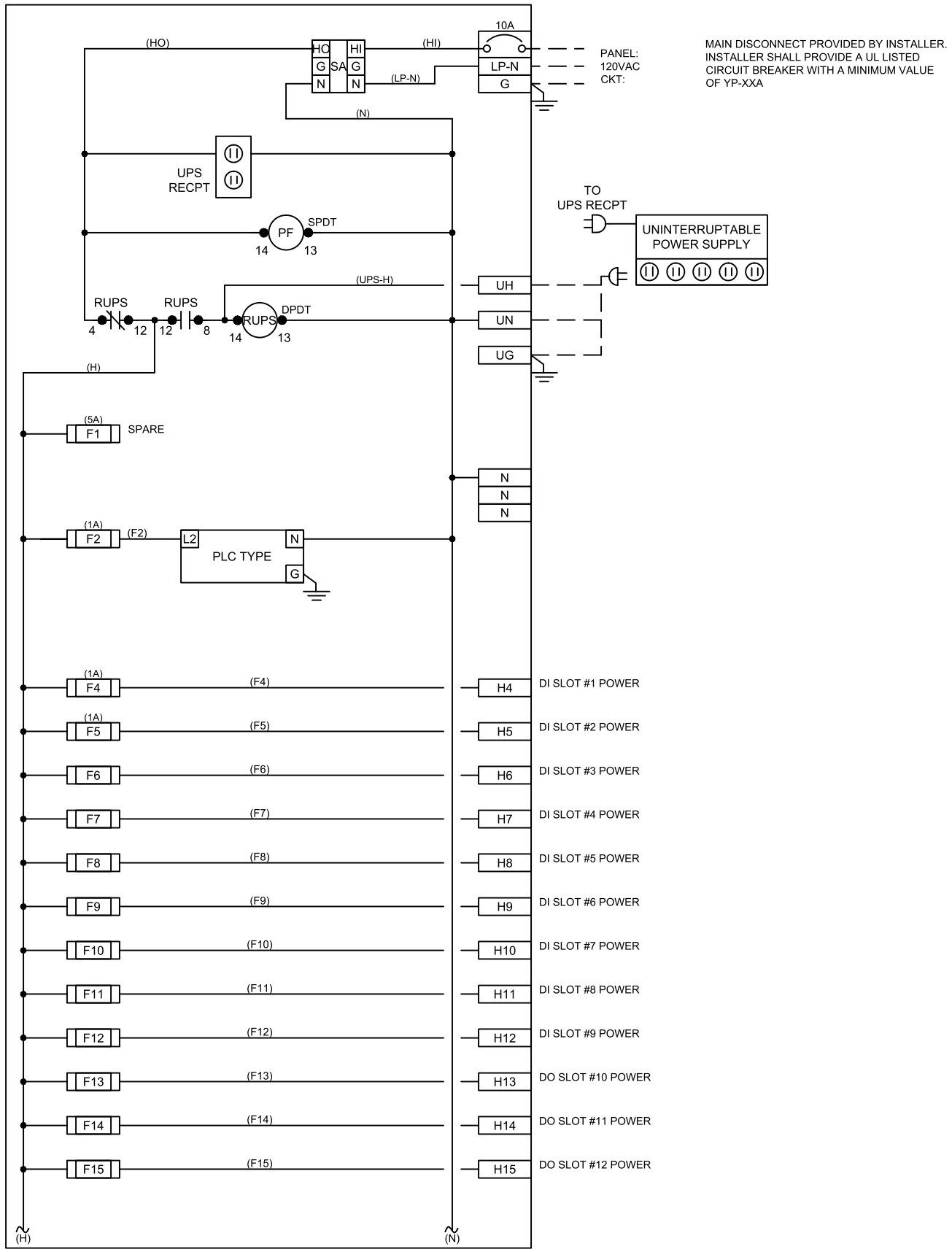
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

LEGEND

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

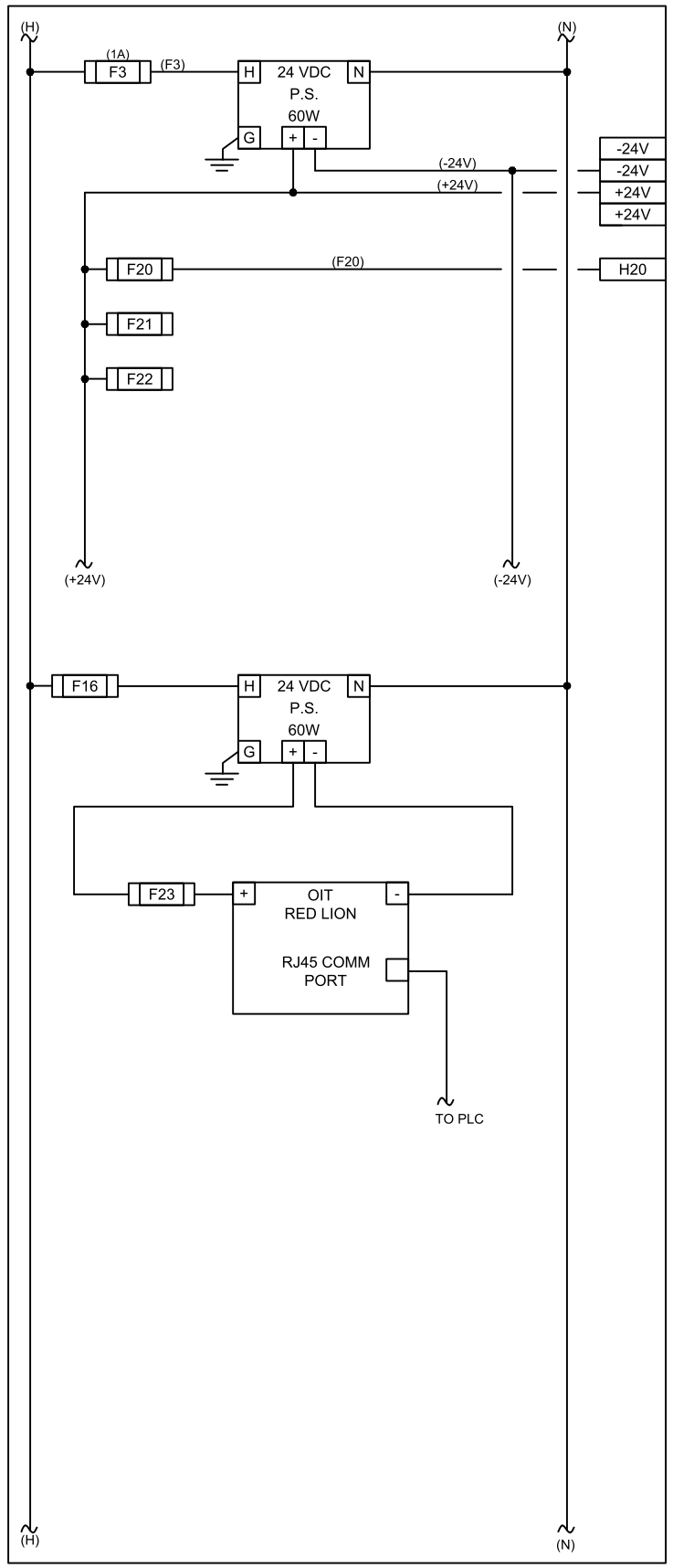
X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D02 LEGEND.dwg [Thursday, April 06, 2017]

MAIN CONTROL PANEL



MAIN DISCONNECT PROVIDED BY INSTALLER.
INSTALLER SHALL PROVIDE A UL LISTED
CIRCUIT BREAKER WITH A MINIMUM VALUE
OF YP-XXA

MAIN CONTROL PANEL



1" IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY	REVISIONS				
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PROJECT NUMBER: 16-873	C				
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	A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

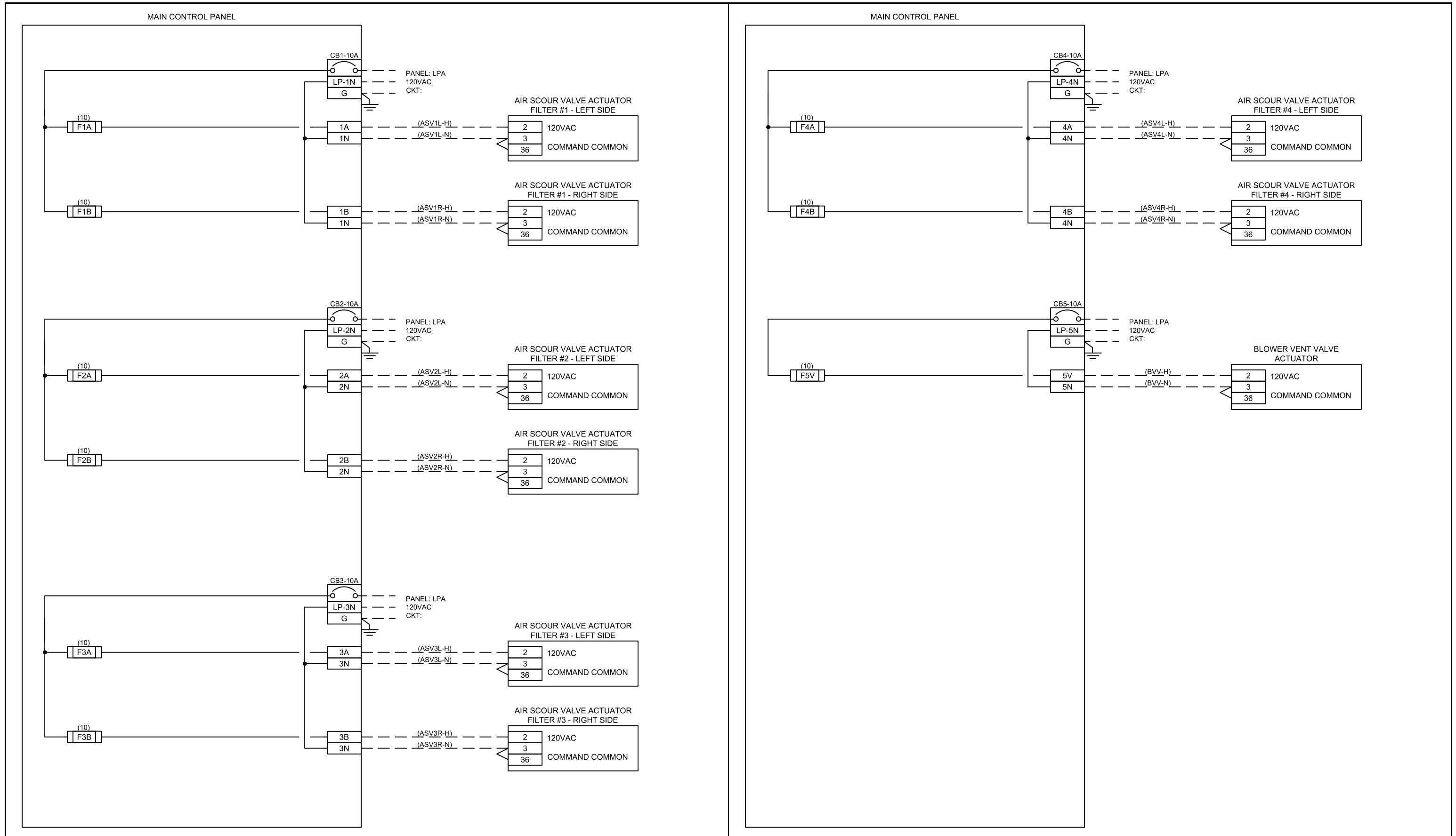
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

POWER DISTRIBUTION

DESIGNED BY:	TFW
DRAWN BY:	TFW
APPROVED BY:	
DATE:	4/2017

03 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D03 Power Distribution.dwg [Thursday, April 06, 2017]



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PROJECT NUMBER: 16-873

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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

AIR SCOUR VALVES
POWER DISTRIBUTION

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

04 / 18

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MAIN CONTROL PANEL - NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 1

IN 0	(1-0)	H4 1-0		SPARE	
IN 1	(1-1)	1-1		SPARE	
IN 2	(1-2)	H4 1-2	(H4-2) (331)	XX XX	CLOSE POSITION INDICATION
IN 3	(1-3)	1-3	(332)	XX XX	OPEN POSITION INDICATION
					FILTER #1 BACKWASH VALVE ACTUATOR
IN 4	(1-4)	N 1-4		SPARE SPARE	
IN 5	(1-5)	H4 1-5	(H4-3)	XX XX	CLOSE POSITION INDICATION
IN 6	(1-6)	1-6	(658)	XX XX	OPEN POSITION INDICATION
					FILTER #1 BW WASTE(DRAIN) VALVE ACTUATOR
IN 7	(1-7)	1-7		SPARE	
IN 8	(1-8)	H4 1-8	(H4-4) (1-8)	12 13	CLOSE POSITION INDICATION
IN 9	(1-9)	1-9	(1-9)	10 11	OPEN POSITION INDICATION
					FILTER #1 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(1-10)	1-10		SPARE	
IN 11	(1-11)	H4 1-11	(H4-5) (663)	XX XX	CLOSE POSITION INDICATION
IN 12	(1-12)	1-12	(662)	XX XX	OPEN POSITION INDICATION
					FILTER #1 LEFT SIDE ISOLATION VALVE VALVE ACTUATOR
IN 13	(1-13)	1-13		SPARE	
IN 14	(1-14)	H4 1-14	(H4-6) (1-14)	XX XX	CLOSE POSITION INDICATION
IN 15	(1-15)	1-15	(1-15)	XX XX	OPEN POSITION INDICATION
					BLOWER VENT VALVE ACTUATOR
* AC COM		N			
* AC COM					

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 2

IN 0	(2-0)	H5 2-0	(2-0)	105	IN AUTO
					COMPRESSOR #1 HOA PANEL
IN 1	(2-1)	2-1	(2-1)	107	IN AUTO
					COMPRESSOR #2 HOA PANEL
IN 2	(2-2)	H5 2-2	(H5-2) (671)	XX XX	CLOSE POSITION INDICATION
IN 3	(2-3)	2-3	(670)	XX XX	OPEN POSITION INDICATION
					FILTER #1 RIGHT SIDE ISOLATION VALVE ACTUATOR
		N		SPARE	
IN 4	(2-4)	2-4		SPARE	
IN 5	(2-5)	H5 2-5	(H5-3) (650)	XX XX	CLOSE POSITION INDICATION
IN 6	(2-6)	2-6		XX XX	OPEN POSITION INDICATION
					FILTER #1 INFLUENT VALVE ACTUATOR
IN 7	(2-7)	2-7		SPARE	
IN 8	(2-8)	H5 2-8	(H5-4) (2-8)	12 13	CLOSE POSITION INDICATION
IN 9	(2-9)	2-9	(2-9)	10 11	OPEN POSITION INDICATION
					FILTER #1 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(2-10)	2-10		SPARE	
IN 11	(2-11)	H5 2-11	(H5-5)	XX XX	CLOSE POSITION INDICATION
IN 12	(2-12)	2-12	(654)	XX XX	OPEN POSITION INDICATION
					FILTER #1 EFFLUENT VALVE ACTUATOR
IN 13	(2-13)	2-13	(2-13)	101	IN AUTO
					PUMP #1 HOA PANEL
IN 14	(2-14)	H5 2-14	(278) (2-14)	XX XX	RUN STATUS
					MCC BACKWASH PUMP #1
IN 15	(2-15)	R1 SPDT 14 13 N 2-15		SPARE	
		H5			
		R1 9 1			
		2-14A		SPARE	
* AC COM		N			
* AC COM					

* COMMONS ARE CONNECTED INTERNALLY

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

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F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 1 & 2

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

05 / 18

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MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 3

IN 0	(3-0)	H6 3-0	SPARE		
IN 1	(3-1)	3-1	SPARE		
IN 2	(3-2)	3-2	XX XX	CLOSE POSITION INDICATION	FILTER #2 BACKWASH VALVE ACTUATOR
IN 3	(3-3)	H6 3-3	(H6-2) (350)	XX XX	OPEN POSITION INDICATION
IN 4	(3-4)	N 3-4	SPARE		
IN 5	(3-5)	3-5	XX XX	CLOSE POSITION INDICATION	FILTER #2 BW WASTE (DRAIN) VALVE ACTUATOR
IN 6	(3-6)	H6 3-6	(H6-3) (659)	XX XX	OPEN POSITION INDICATION
IN 7	(3-7)	3-7	SPARE		
IN 8	(3-8)	H6 3-8	(H6-4) (3-8)	12 13	CLOSE POSITION INDICATION	FILTER #2 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(3-9)	3-9	(3-9)	10 11	OPEN POSITION INDICATION
IN 10	(3-10)	3-10	SPARE		
IN 11	(3-11)	H6 3-11	(H6-5) (665)	XX XX	CLOSE POSITION INDICATION	FILTER #2 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 12	(3-12)	3-12	(664)	XX XX	OPEN POSITION INDICATION
IN 13	(3-13)	3-13	(3-13)	103	IN AUTO	PUMP #2 HOA PANEL
IN 14	(3-14)	H6 3-14	(279) (3-14)	XX XX	RUN STATUS	MCC BACKWASH PUMP #2
IN 15	(3-15)	N 3-15	SPARE		
		H6 3-14A	SPARE		
* AC COM * AC COM		N			

R2 SPDT: 14, 13, N

R2: 9, 1, H6

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 4

IN 0	(4-0)	H7 4-0	SPARE		
IN 1	(4-1)	4-1	SPARE		
IN 2	(4-2)	H7 4-2	(H7-2) (673)	XX XX	CLOSE POSITION INDICATION	FILTER #2 RIGHT SIDE ISOLATION VALVE ACTUATOR
IN 3	(4-3)	4-3	(672)	XX XX	OPEN POSITION INDICATION
		N	SPARE		
IN 4	(4-4)	4-4	SPARE		
IN 5	(4-5)	4-5	XX XX	CLOSE POSITION INDICATION	FILTER #2 INFLUENT VALVE ACTUATOR
IN 6	(4-6)	H7 4-6	(H7-3) (651)	XX XX	OPEN POSITION INDICATION
IN 7	(4-7)	4-7	SPARE		
IN 8	(4-8)	H7 4-8	(H7-4) (4-8)	12 13	CLOSE POSITION INDICATION	FILTER #2 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(4-9)	4-9	(4-9)	10 11	OPEN POSITION INDICATION
IN 10	(4-10)	4-10	SPARE		
IN 11	(4-11)	4-11	XX XX	CLOSE POSITION INDICATION	FILTER #2 EFFLUENT VALVE ACTUATOR
IN 12	(4-12)	H7 4-12	(H7-5) (655)	XX XX	OPEN POSITION INDICATION
IN 13	(4-13)	4-13	SPARE		
IN 14	(4-14)	4-14	SPARE		
IN 15	(4-15)	4-15	SPARE		
* AC COM * AC COM		N			

* COMMONS ARE CONNECTED INTERNALLY

1" IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 3 & 4

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

06 / 18

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MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 5

IN 0	(5-0)	H8 5-0	SPARE	
IN 1	(5-1)	5-1	SPARE	
IN 2	(5-2)	5-2	XX CLOSE POSITION INDICATION	FILTER #3 BACKWASH VALVE ACTUATOR
IN 3	(5-3)	H8 5-3 (H8-2) (368)	XX OPEN POSITION INDICATION	
IN 4	(5-4)	N 5-4	SPARE	
IN 5	(5-5)	H8 5-5 (H8-3)	XX CLOSE POSITION INDICATION	FILTER #3 BW WASTE (DRAIN) VALVE ACTUATOR
IN 6	(5-6)	5-6 (660)	XX OPEN POSITION INDICATION	
IN 7	(5-7)	5-7	SPARE	
IN 8	(5-8)	H8 5-8 (H8-4) (5-8)	12 CLOSE POSITION INDICATION	FILTER #3 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(5-9)	5-9 (5-9)	10 OPEN POSITION INDICATION 11	
IN 10	(5-10)	5-10	SPARE	
IN 11	(5-11)	H8 5-11 (H8-5) (667)	XX CLOSE POSITION INDICATION	FILTER #3 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 12	(5-12)	5-12 (666)	XX OPEN POSITION INDICATION	
IN 13	(5-13)	5-13	SPARE	
IN 14	(5-14)	5-14	SPARE	
IN 15	(5-15)	5-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 6

IN 0	(6-0)	H9 6-0	SPARE	
IN 1	(6-1)	6-1	SPARE	
IN 2	(6-2)	H9 6-2 (H9-2) (675)	XX CLOSE POSITION INDICATION	FILTER #3 RIGHT SIDE ISOLATION VALVE ACTUATOR
IN 3	(6-3)	6-3 (674)	XX OPEN POSITION INDICATION	
		N	SPARE	
IN 4	(6-4)	6-4	SPARE	
IN 5	(6-5)	H9 6-5 (H9-3)	XX CLOSE POSITION INDICATION	FILTER #3 INFLUENT VALVE ACTUATOR
IN 6	(6-6)	6-6 (652)	XX OPEN POSITION INDICATION	
IN 7	(6-7)	6-7	SPARE	
IN 8	(6-8)	H9 6-8 (H9-4) (6-8)	12 CLOSE POSITION INDICATION	FILTER #3 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 9	(6-9)	6-9 (6-9)	10 OPEN POSITION INDICATION 11	
IN 10	(6-10)	6-10	SPARE	
IN 11	(6-11)	H9 6-11 (H9-5)	XX CLOSE POSITION INDICATION	FILTER #3 EFFLUENT VALVE ACTUATOR
IN 12	(6-12)	6-12 (RLY-21)	XX OPEN POSITION INDICATION	
IN 13	(6-13)	6-13	SPARE	
IN 14	(6-14)	6-14	SPARE	
IN 15	(6-15)	6-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

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REVISIONS

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GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

DI SLOT 5 & 6

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

07 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D07 DI Slot 5 & 6.dwg [Thursday, April 06, 2017]

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 7

IN 0	(7-0)	H10 7-0	SPARE	
IN 1	(7-1)	7-1	SPARE	
IN 2	(7-2)	7-2	(382)	XX CLOSE POSITION INDICATION XX
IN 3	(7-3)	H10 1-3	(H10-2) (386)	XX OPEN POSITION INDICATION XX — FILTER #4 BACKWASH VALVE ACTUATOR
IN 4	(7-4)	N 7-4	SPARE	
IN 5	(7-5)	H10 7-5	(H10-3)	XX CLOSE POSITION INDICATION XX
IN 6	(7-6)	7-6	(661)	XX OPEN POSITION INDICATION XX — FILTER #4 BW WASTE(DRAIN) VALVE ACTUATOR
IN 7	(7-7)	7-7	SPARE	
IN 8	(7-8)	H10 7-8	(H10-4) (7-8)	12 13 CLOSE POSITION INDICATION
IN 9	(7-9)	7-9	(7-9)	10 11 OPEN POSITION INDICATION — FILTER #4 LEFT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(7-10)	7-10	SPARE	
IN 11	(7-11)	H10 7-11	(H10-5) (669)	XX CLOSE POSITION INDICATION XX
IN 12	(7-12)	7-12	(668)	XX OPEN POSITION INDICATION XX — FILTER #4 LEFT SIDE ISOLATION VALVE ACTUATOR
IN 13	(7-13)	7-13	SPARE	
IN 14	(7-14)	7-14	SPARE	
IN 15	(7-15)	7-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

MAIN CONTROL PANEL - LOCATED ON NEW BACK PANEL

1769-IA16

DI MODULE
SLOT 8

IN 0	(8-0)	H11 8-0	SPARE	
IN 1	(8-1)	8-1	SPARE	
IN 2	(8-2)	H11 8-2	(H11-2) (677)	XX CLOSE POSITION INDICATION XX
IN 3	(8-3)	8-3	(676)	XX OPEN POSITION INDICATION XX — FILTER #4 RIGHT SIDE ISOLATION VALVE ACTUATOR
		N	SPARE	
IN 4	(8-4)	8-4	SPARE	
IN 5	(8-5)	H11 8-5	(H11-3)	XX CLOSE POSITION INDICATION XX
IN 6	(8-6)	8-6	(653)	XX OPEN POSITION INDICATION XX — FILTER #4 INFLUENT VALVE ACTUATOR
IN 7	(8-7)	8-7	SPARE	
IN 8	(8-8)	H11 8-8	(H11-4) (8-8)	12 13 CLOSE POSITION INDICATION
IN 9	(8-9)	8-9	(8-9)	10 11 OPEN POSITION INDICATION — FILTER #4 RIGHT SIDE AIR SCOUR VALVE ACTUATOR
IN 10	(8-10)	8-10	SPARE	
IN 11	(8-11)	H11 8-11	(H11-5)	XX CLOSE POSITION INDICATION XX
IN 12	(8-12)	8-12	(657)	XX OPEN POSITION INDICATION XX — FILTER #4 EFFLUENT VALVE ACTUATOR
IN 13	(8-13)	8-13	SPARE	
IN 14	(8-14)	8-14	SPARE	
IN 15	(8-15)	8-15	SPARE	
* AC COM		N		
* AC COM				

* COMMONS ARE CONNECTED INTERNALLY

1" — IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
E				
D				
C				
B				
A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

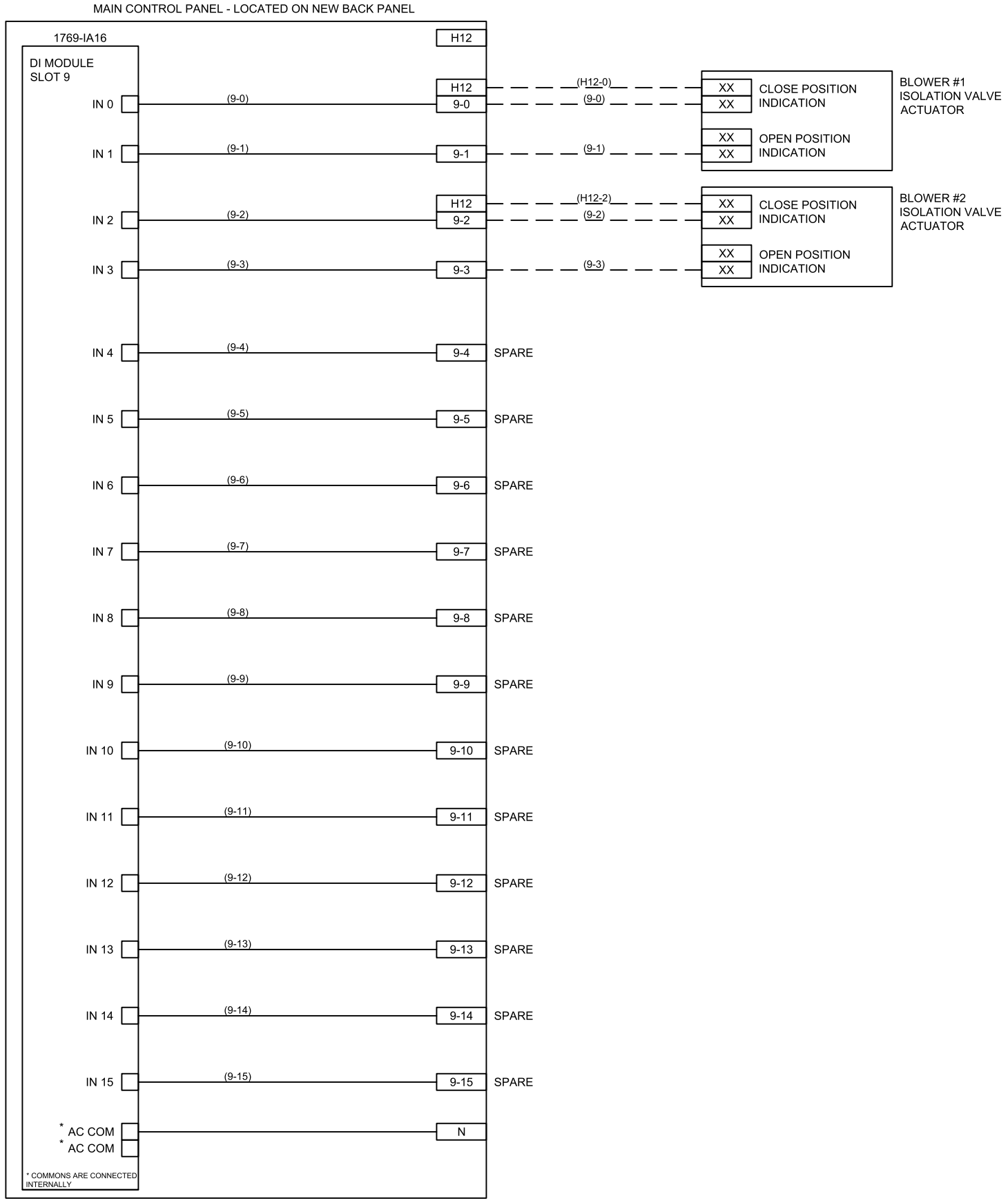
DI SLOT 7 & 8

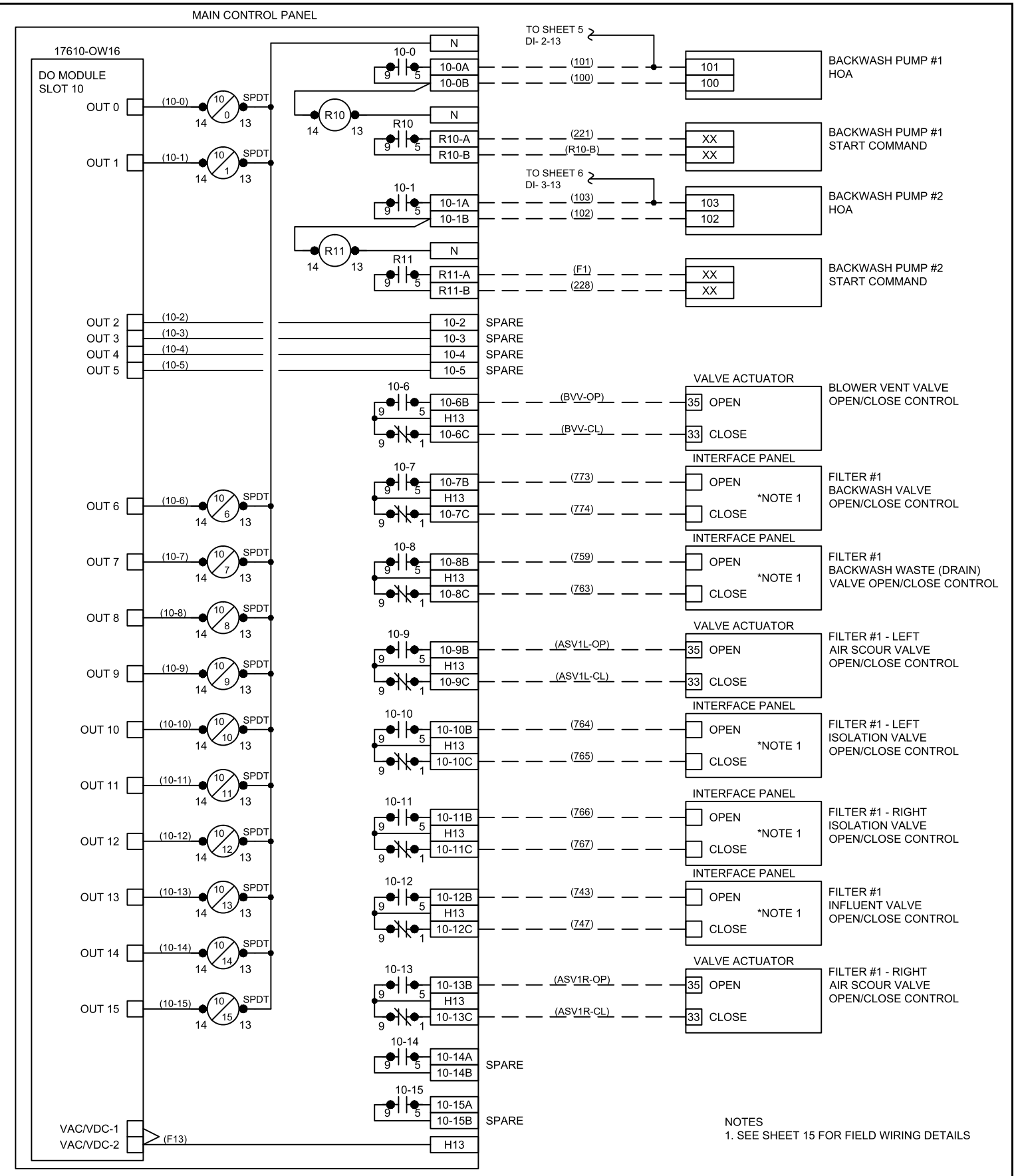
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

08 / 18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D08 DI Slot 7 & 8.dwg [Thursday, April 06, 2017]





1"
IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
E				
D				
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A				

GENERAL CONTRACTOR
MOLTZ CONSTRUCTION
2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR
STURGEON ELECTRIC
2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

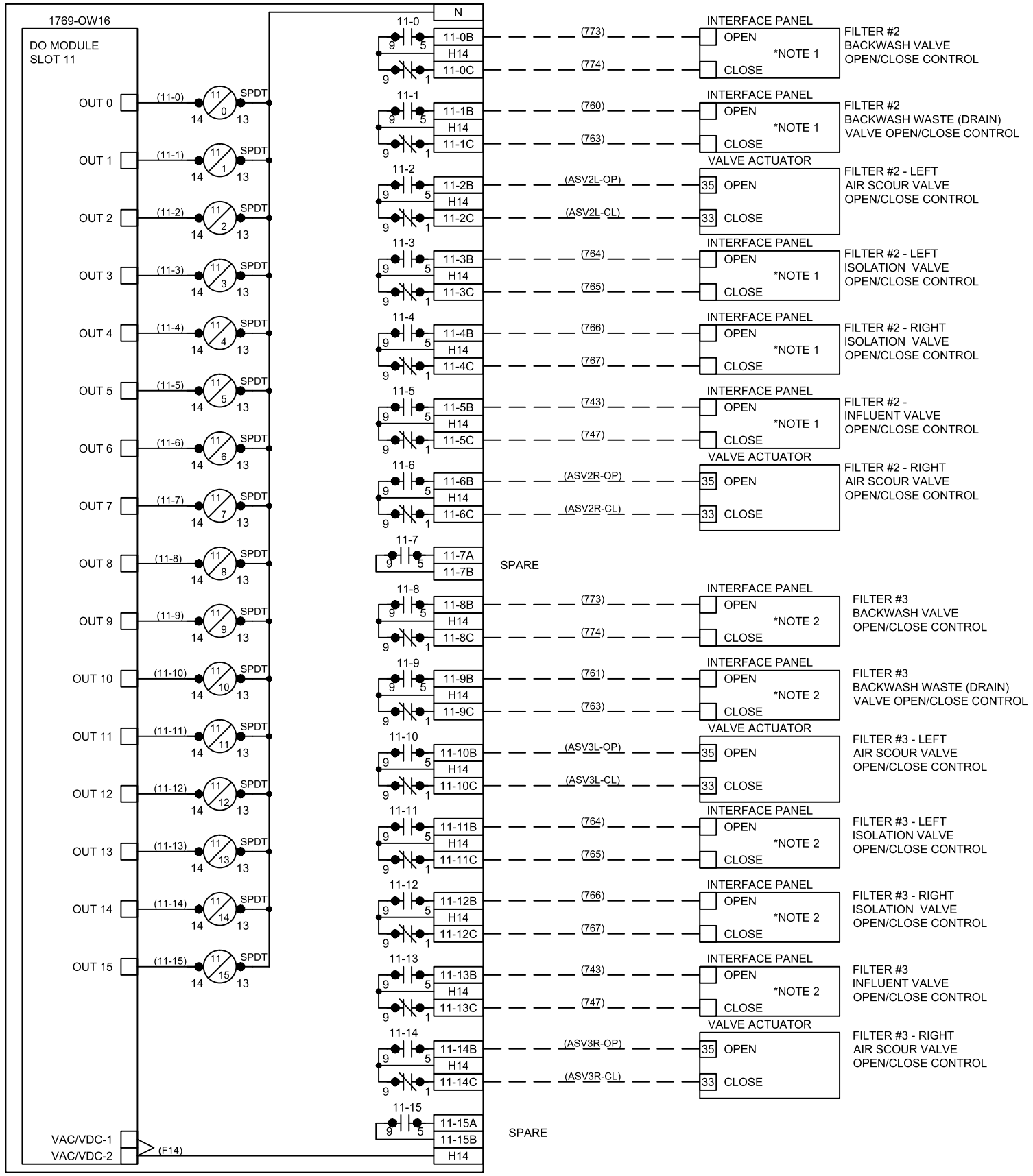
DI SLOT 9 & DO SLOT 10

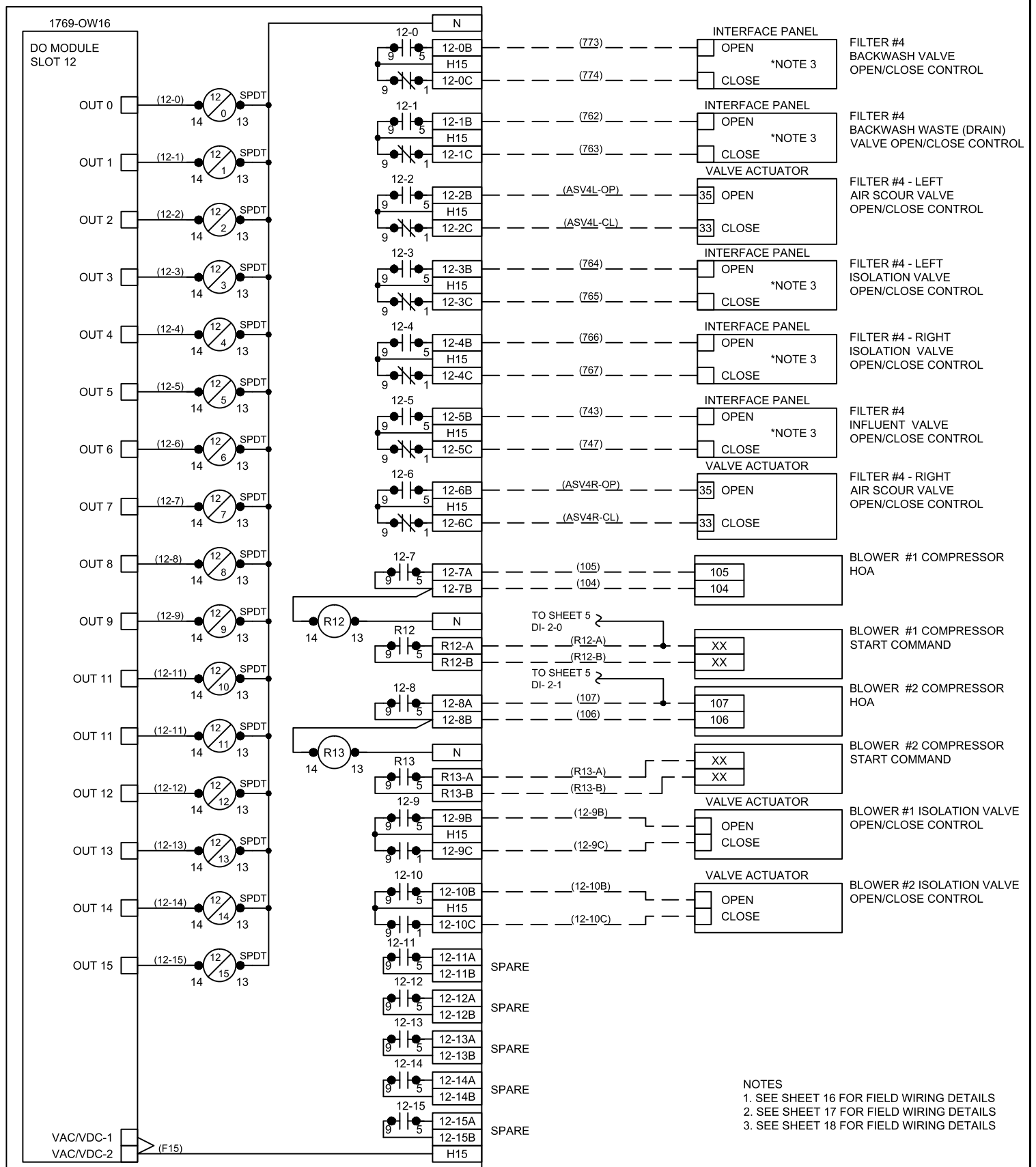
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 2/2017

09
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D09 DI Slot 9 & DO SLOT 10.dwg [Thursday, April 06, 2017]





1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

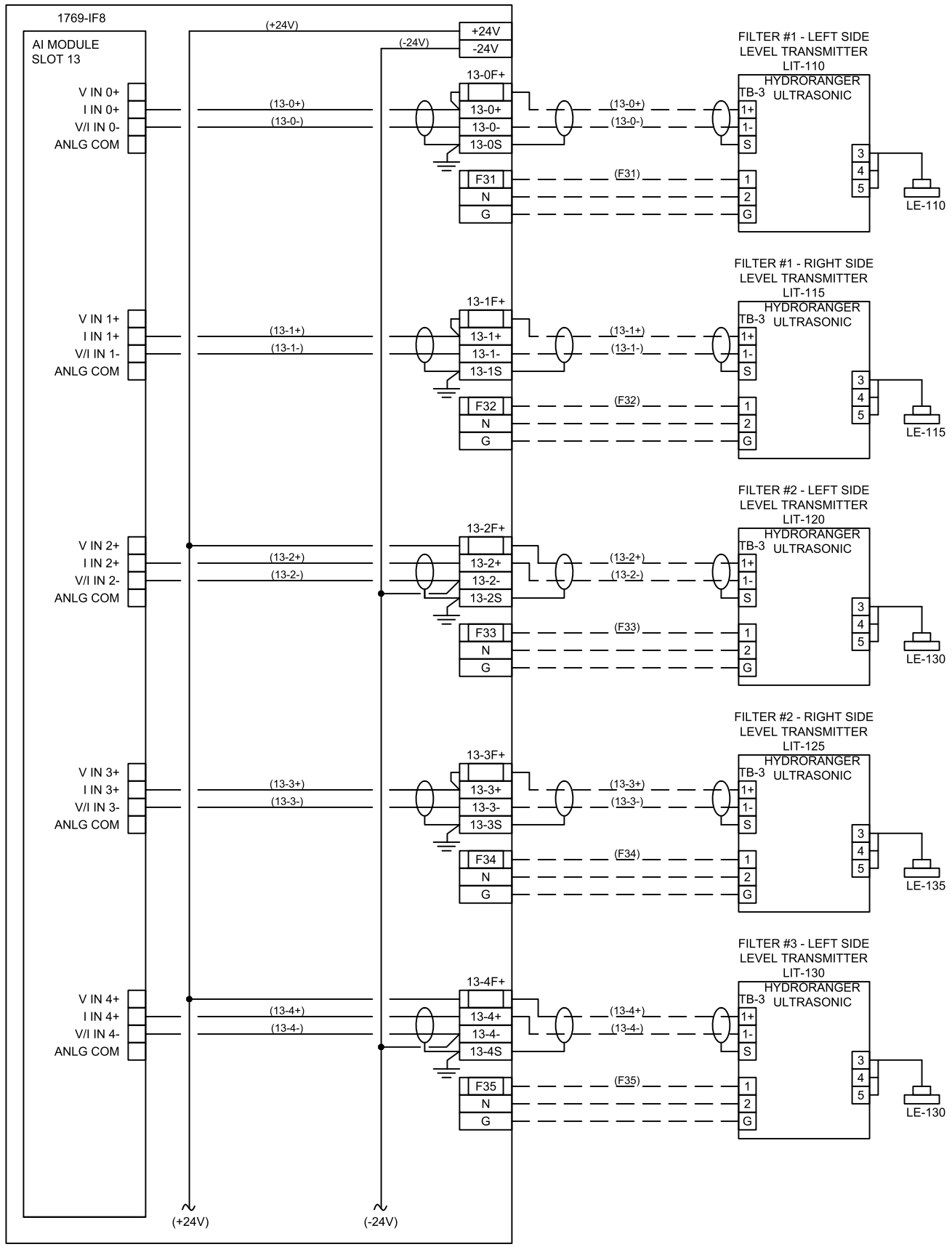
DO SLOTS 11 & 12

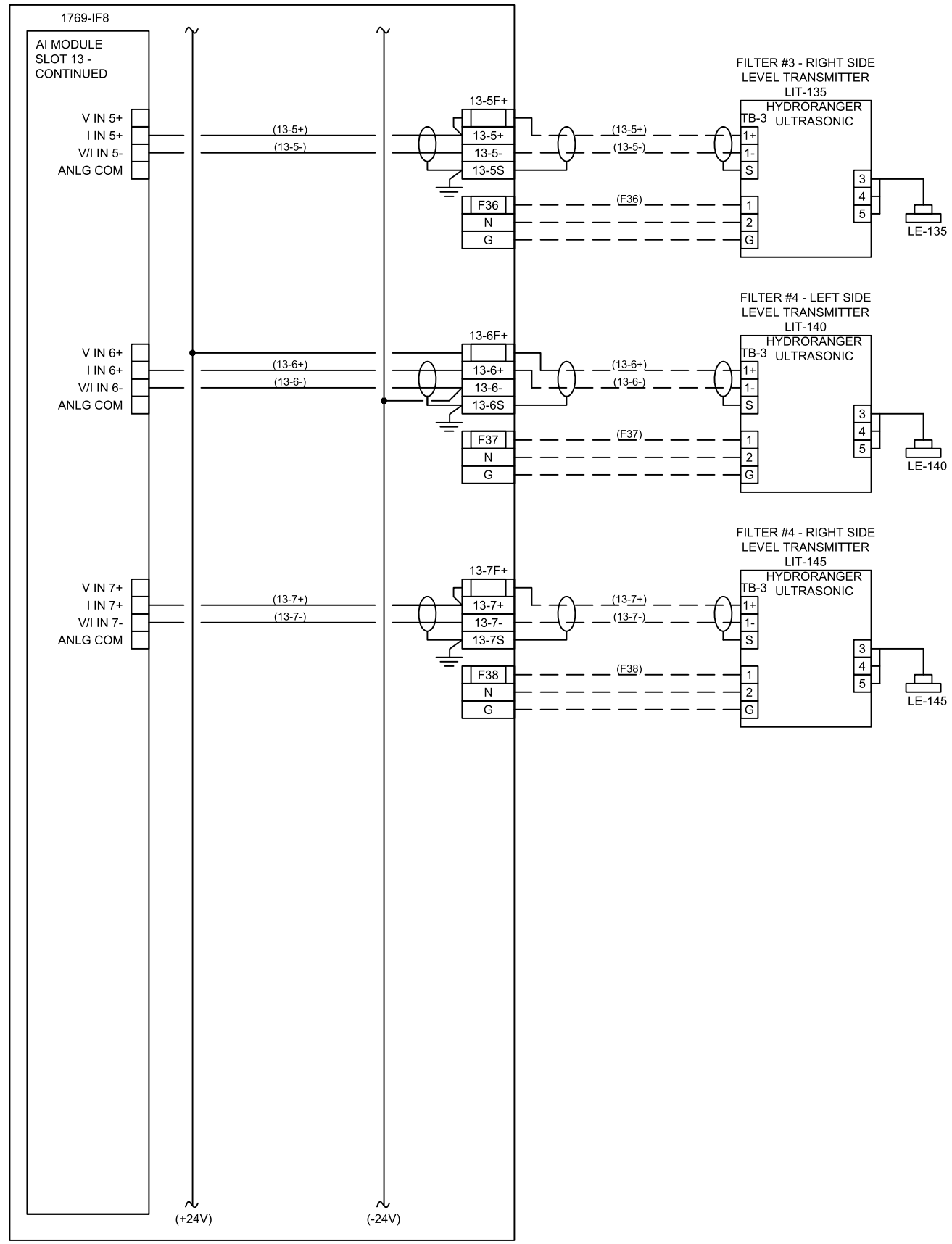
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

10
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D10 DO Slots 11 & 12.dwg [Thursday, April 06, 2017]





1" — IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

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720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

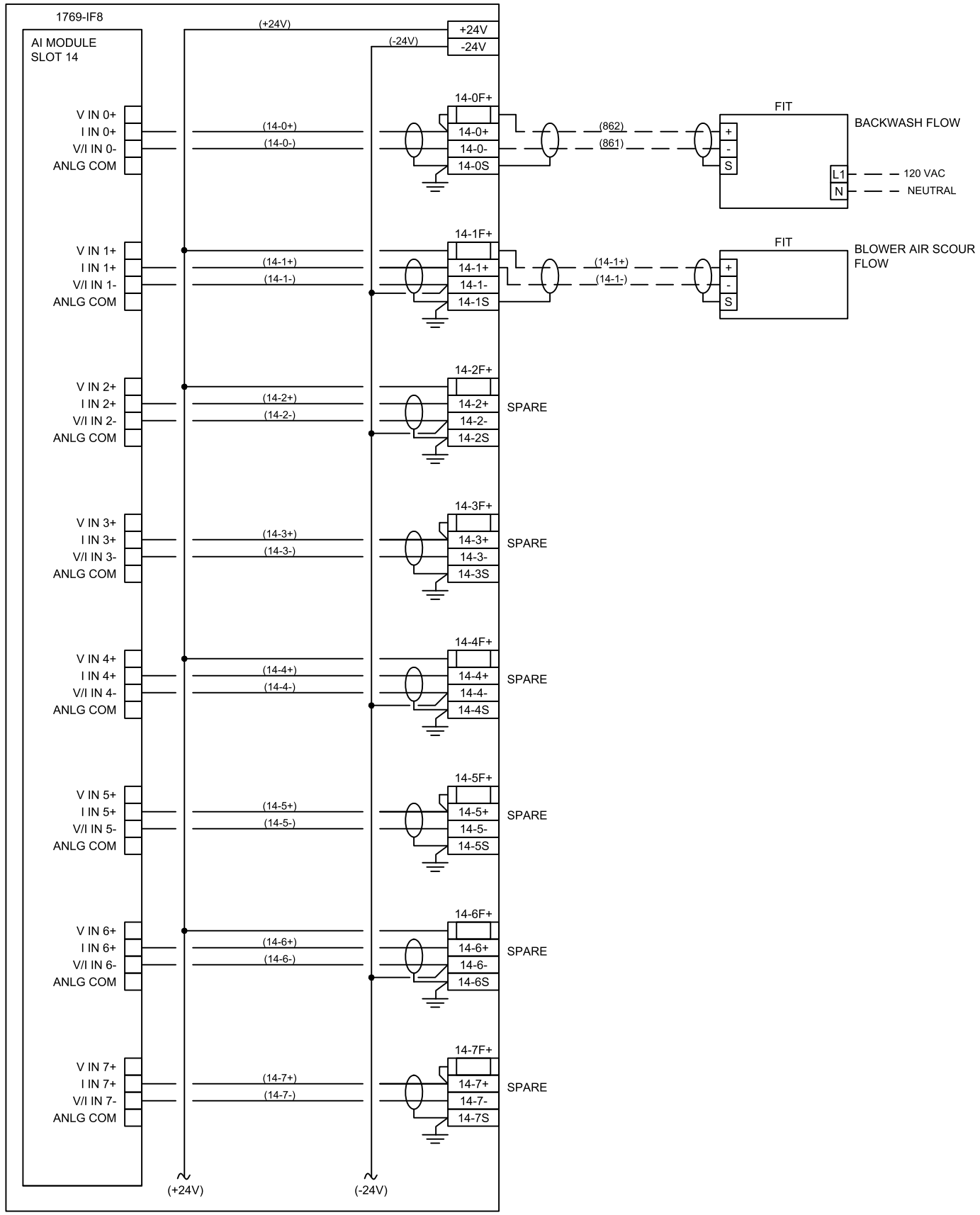
AI SLOT 13

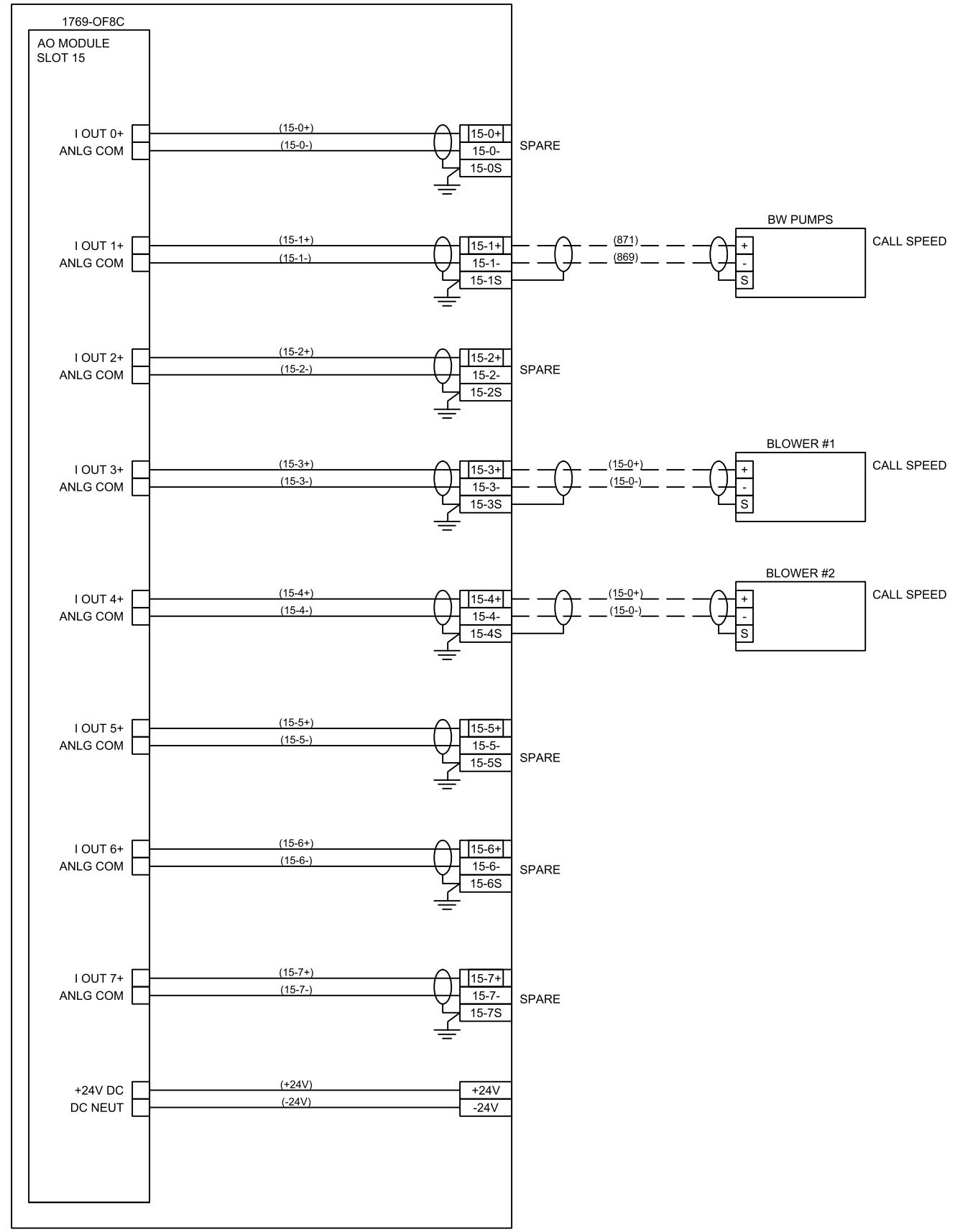
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

11
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D11 AI Slot 13.dwg [Thursday, April 06, 2017]





1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

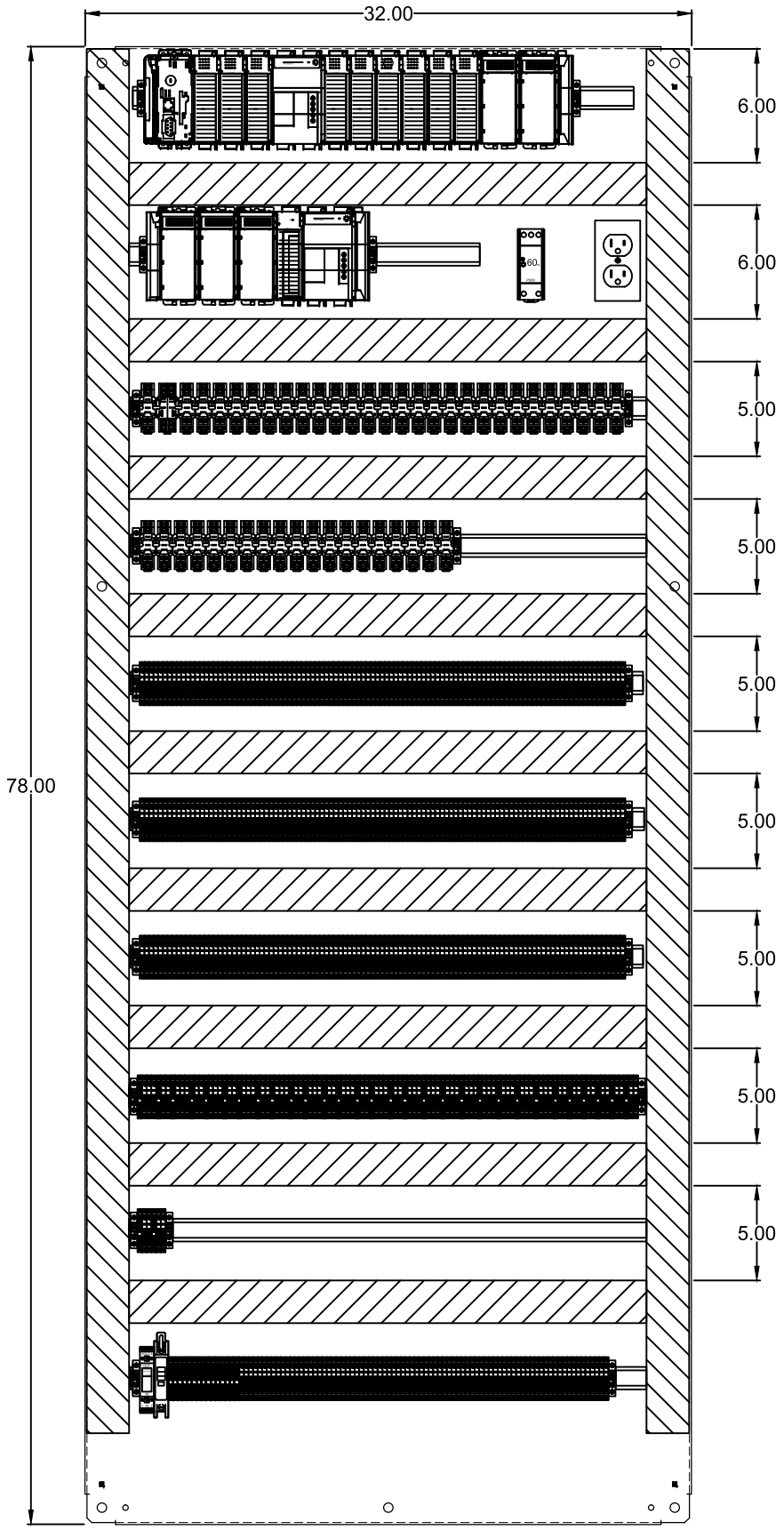
AI SLOT 14 & AO SLOT 15

WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

12
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D12 AI Slot 14 & AO Slot 15.dwg [Thursday, April 06, 2017]



A90P36F1

1"

IF THIS LINE IS NOT EQUAL TO ONE INCH
ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTORS

2881 S 31ST aVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL
ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

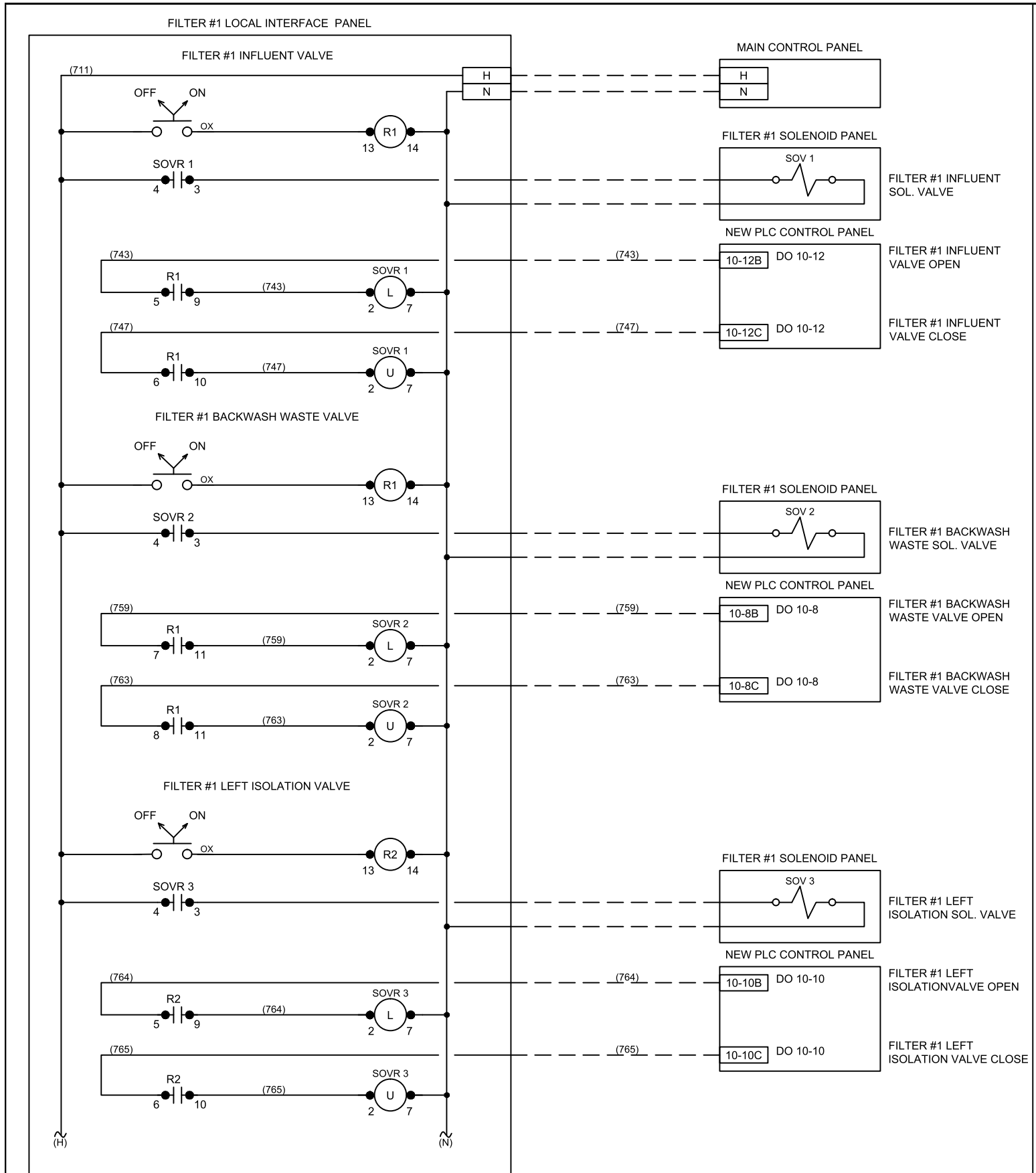
PANEL LAYOUT

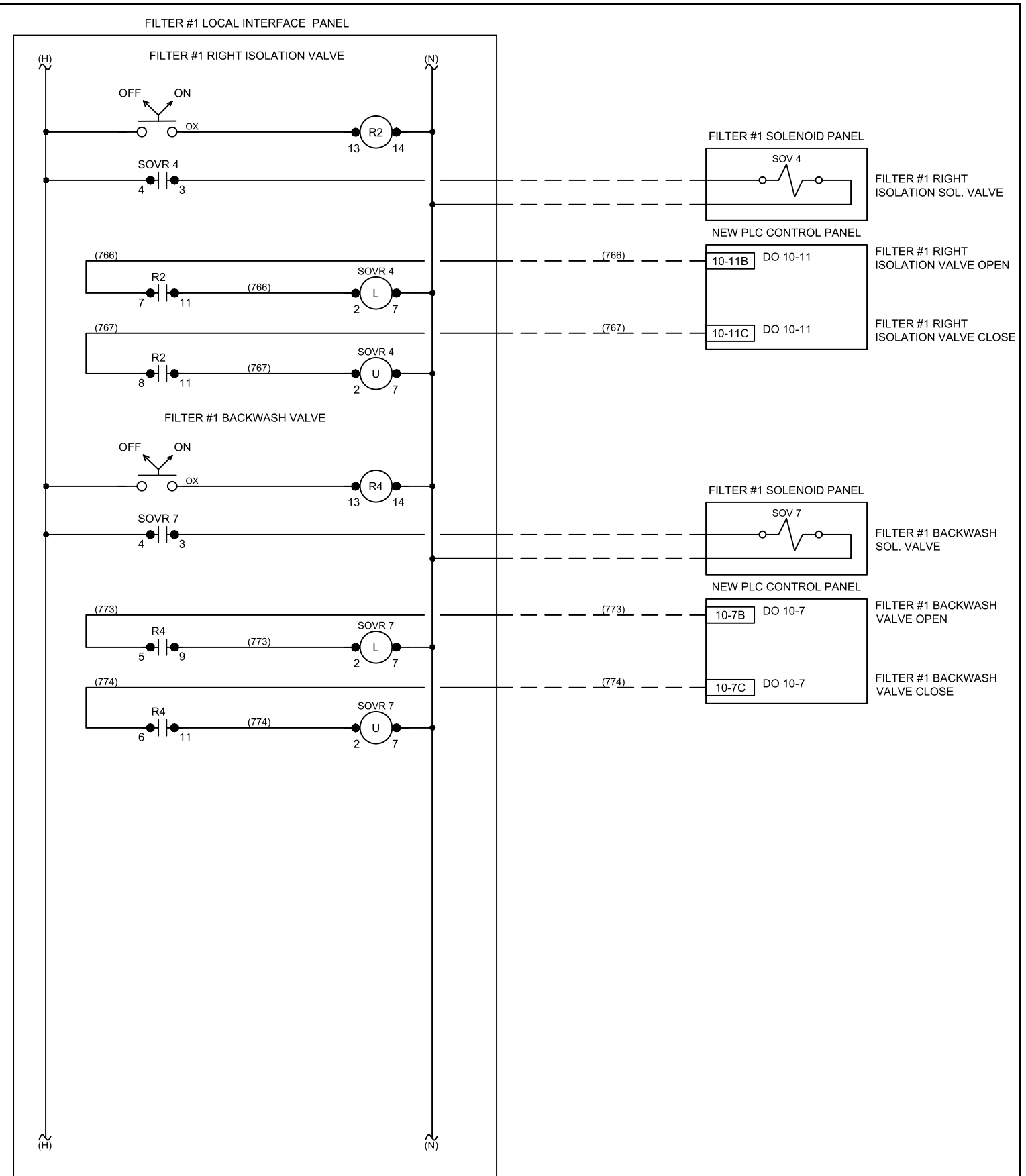
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: TFW
APPROVED BY:
DATE: 4/2017

13
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D13 Panel Layout.dwg





1"

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PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

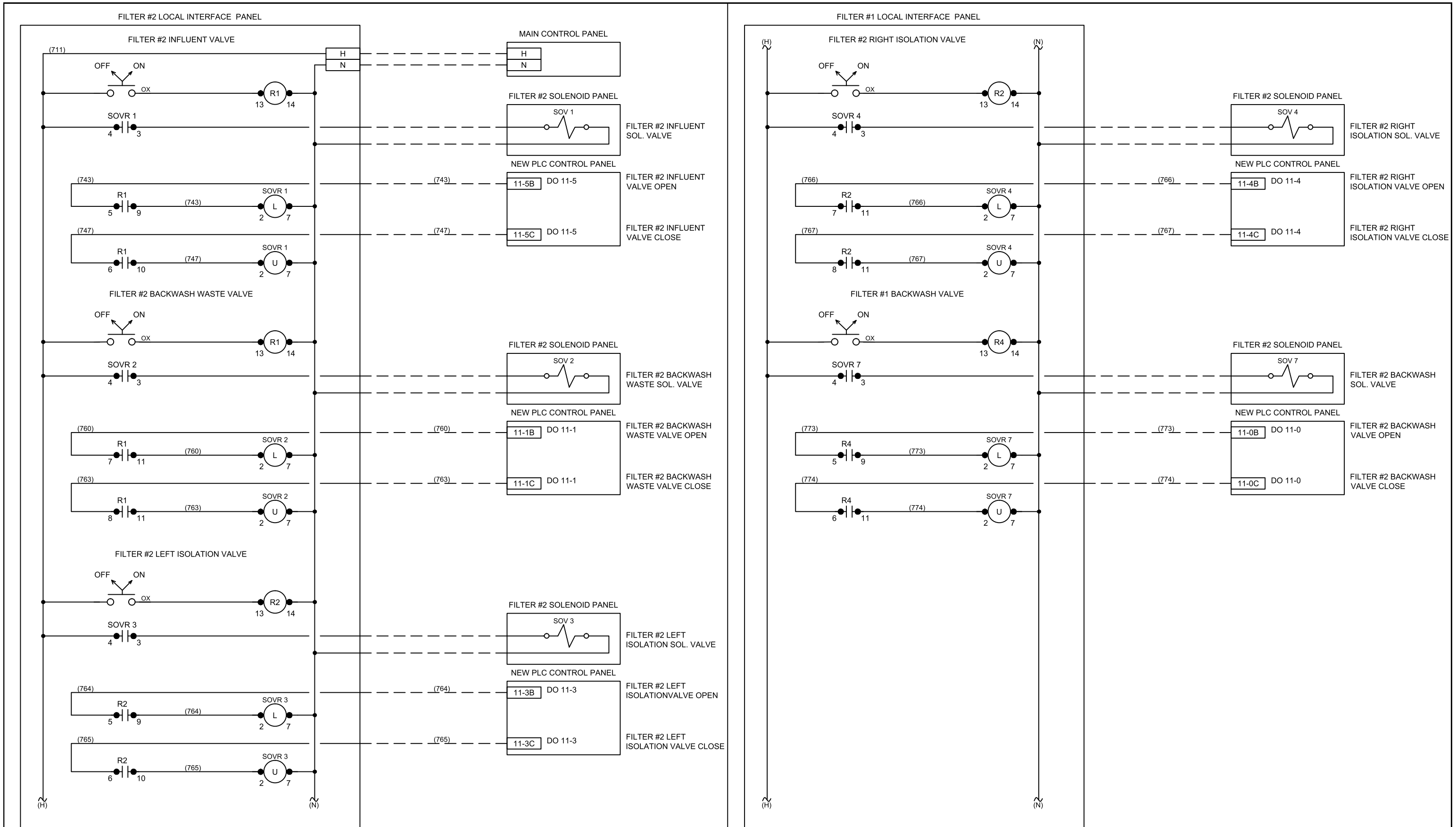
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

15
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D15 Filter #1 Valve Field Wiring.dwg [Thursday, April 06, 2017]



1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

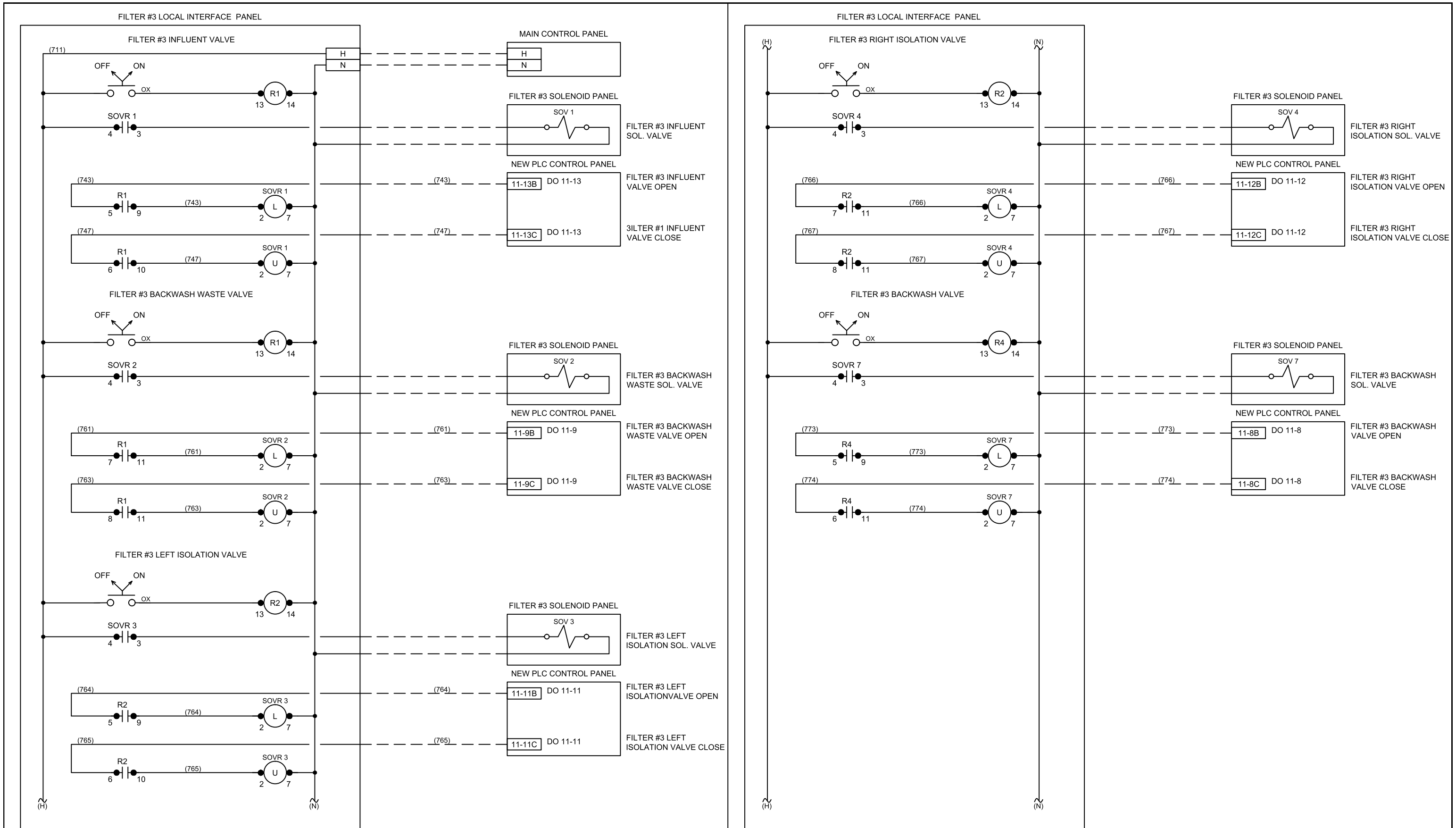
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #2 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

16
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D16 Filter #2 Valve Field Wiring.dwg [Thursday, April 06, 2017]



1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
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GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS
720.344.7771 720.344.7460 FAX

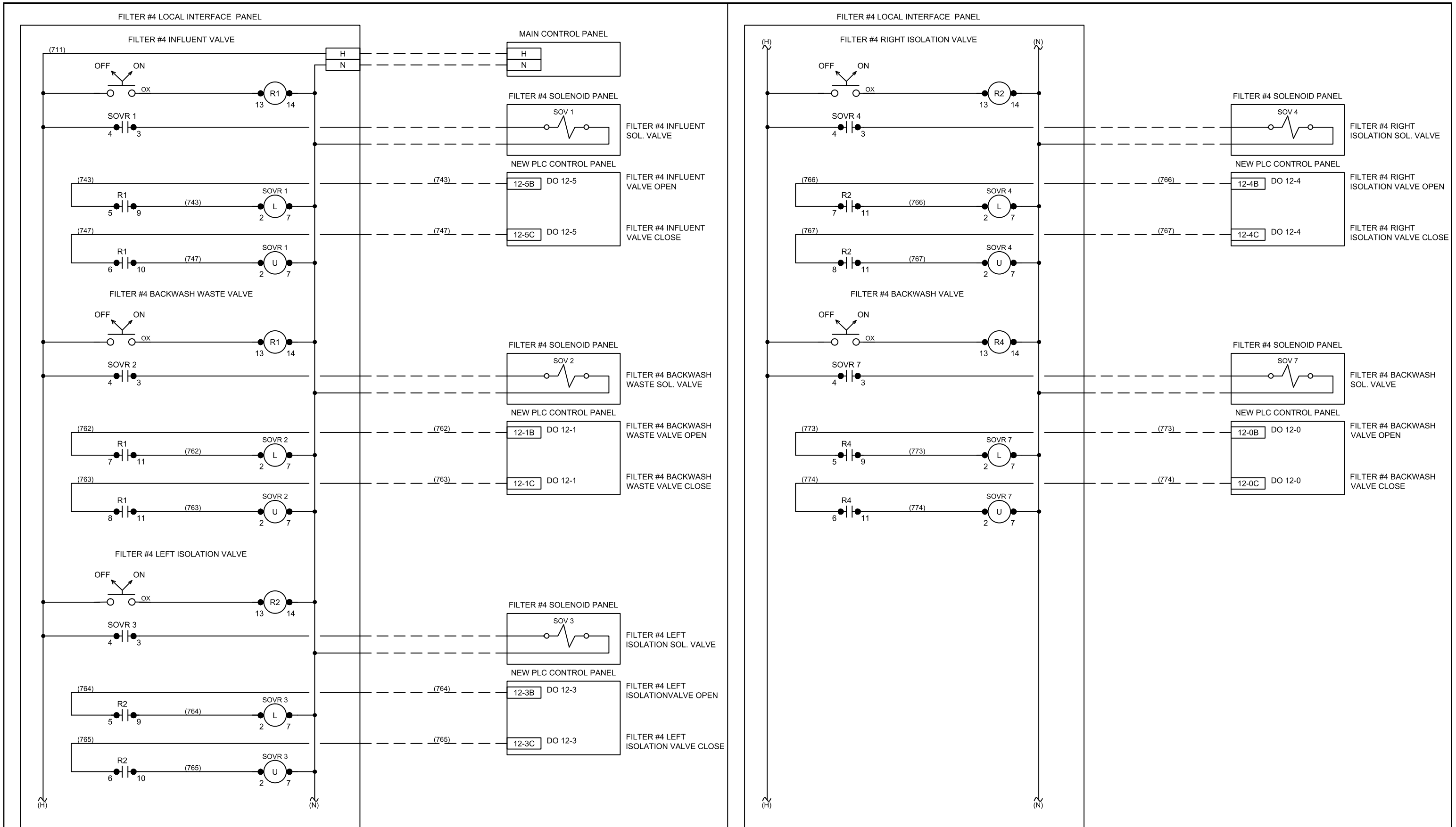
CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #3 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

17
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D17 Filter #3 Valve Field Wiring.dwg [Thursday, April 06, 2017]



1"

IF THIS LINE IS NOT EQUAL TO ONE INCH ADJUST SCALES ACCORDINGLY

PROJECT NUMBER: 16-873

REVISIONS

REV.	DESCRIPTION	BY	DATE	APP.
F				
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A				

GENERAL CONTRACTOR

MOLTZ CONSTRUCTION

2881 S 31ST AVE #5A
GREELEY, CO 80631
970-330-3248

ELECTRICAL CONTRACTOR

STURGEON ELECTRIC

2775 RIVERSIDE PARKWAY
GRAND JUNCTION, CO 81501
970-281-9041

BROWNS HILL ENGINEERING & CONTROLS

720.344.7771 720.344.7460 FAX

CITY OF GRAND JUNCTION
WTP FILTER UPGRADE

FILTER #4 EXISTING VALVES
FIELD WIRING
WIRING DIAGRAMS

DESIGNED BY: TFW
DRAWN BY: KJW
APPROVED BY:
DATE: 4/2017

18
18

X:\BH Office Clients\Grand Junction\16-873 WTP Filter Upgrade- Bidding\16-873 Wiring Diagrams\BHEC AutoCAD Drawings\D18 Filter #4 Valve Field Wiring.dwg [Thursday, April 06, 2017]

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Author:
Created: 06/26/2007 12:29:09 pm
Last Modified: 04/12/2012 12:43:47 pm

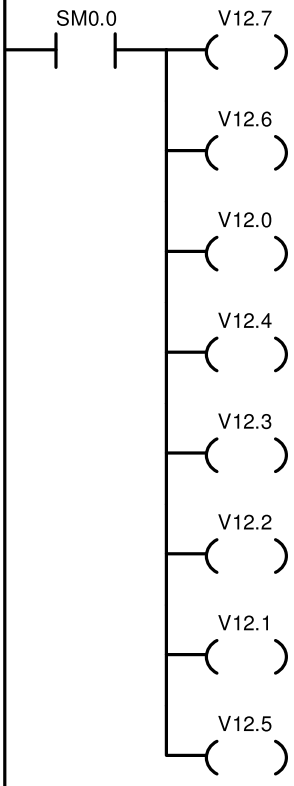
Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

PROGRAM COMMENTS
Press F1 for help and example program

PROGRAM COMMENTS
Press F1 for help and example program

Network 1 TD200 MESSAGE DISPLAY

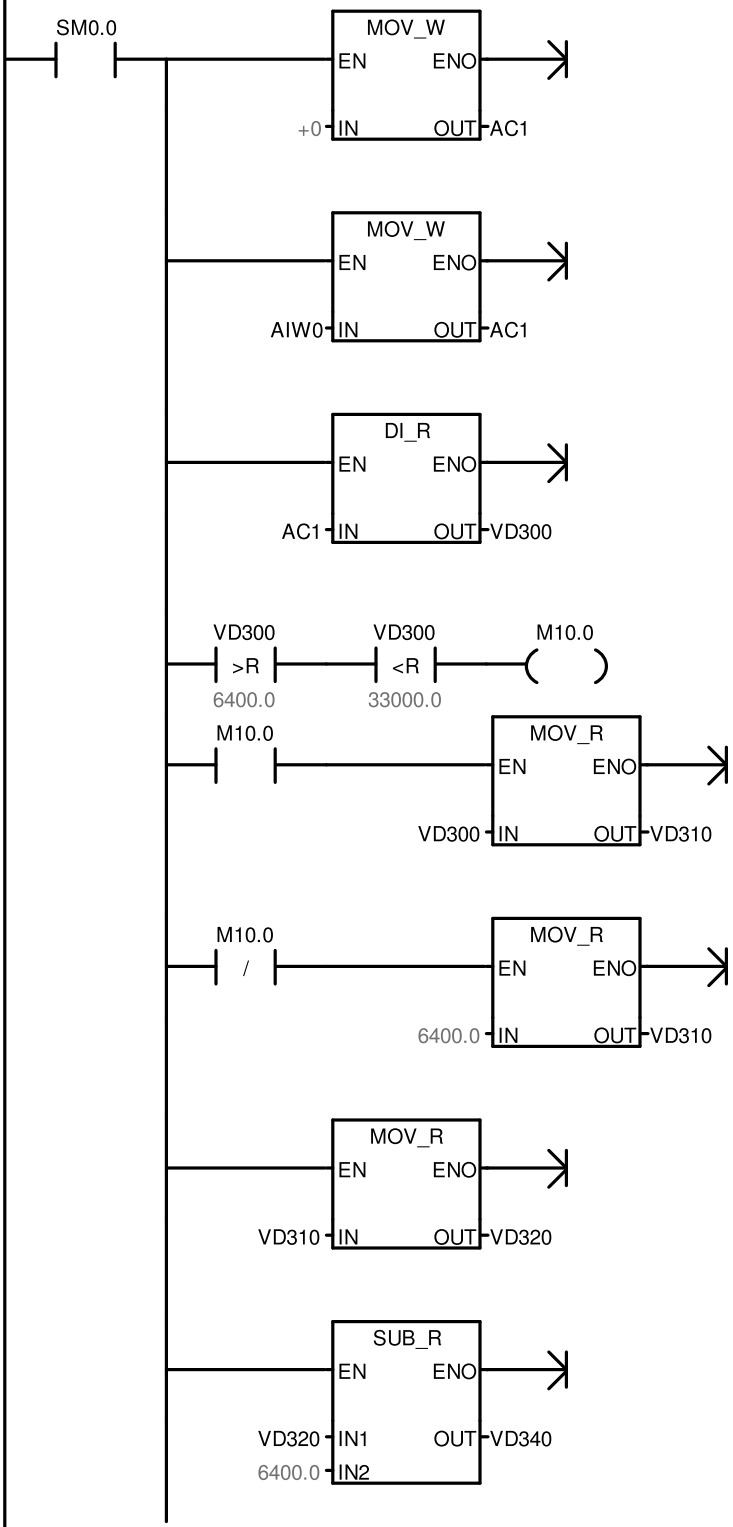
NETWORK COMMENTS

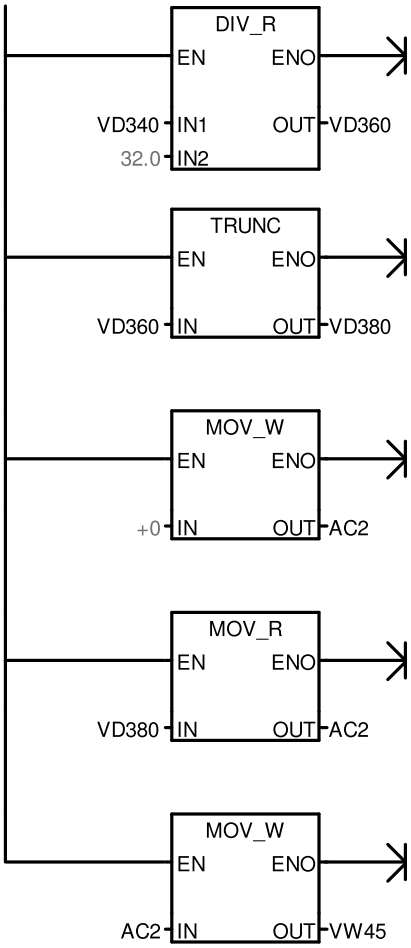


Network 2 Flow Rate

NETWORK COMMENTS

This rung is the analog control for the PUMP STATION flow

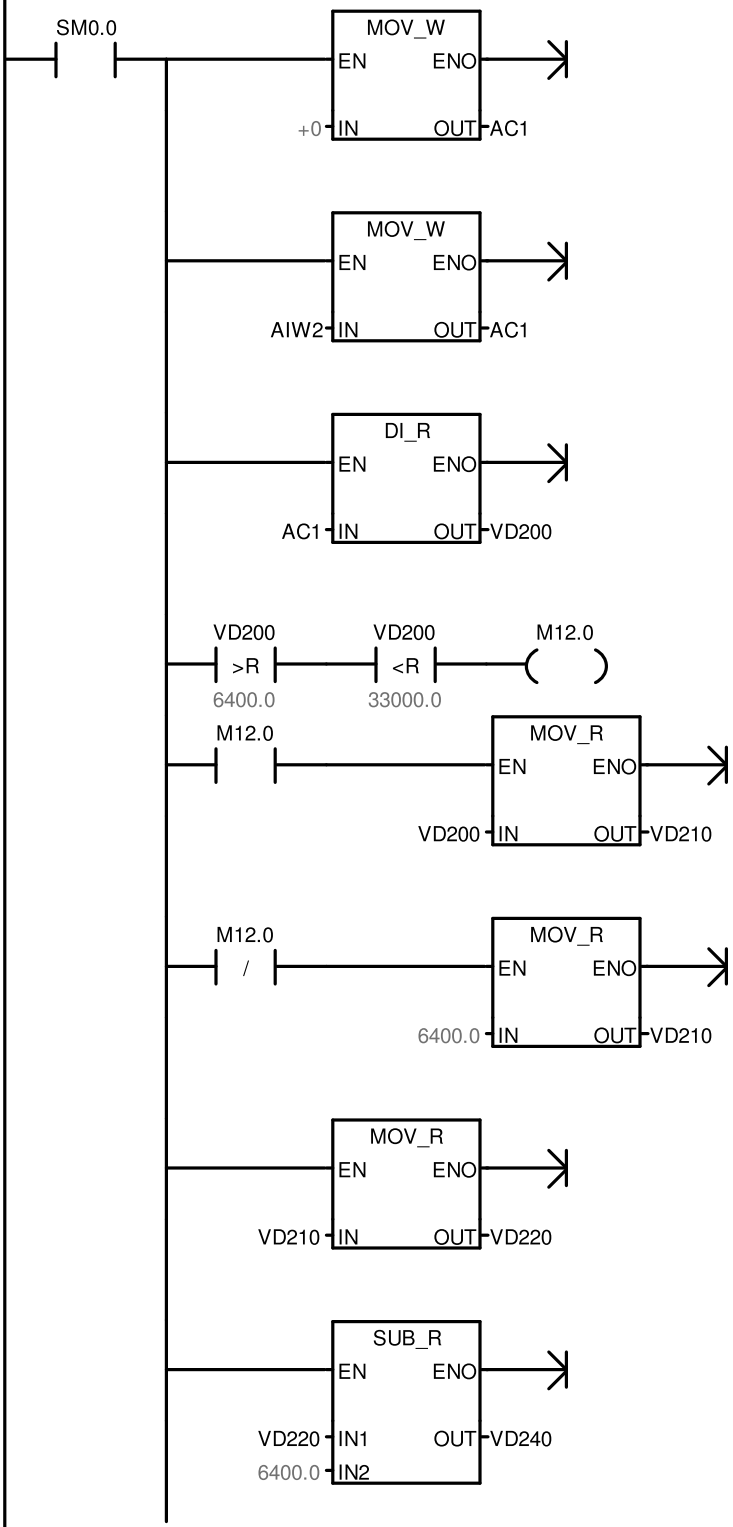


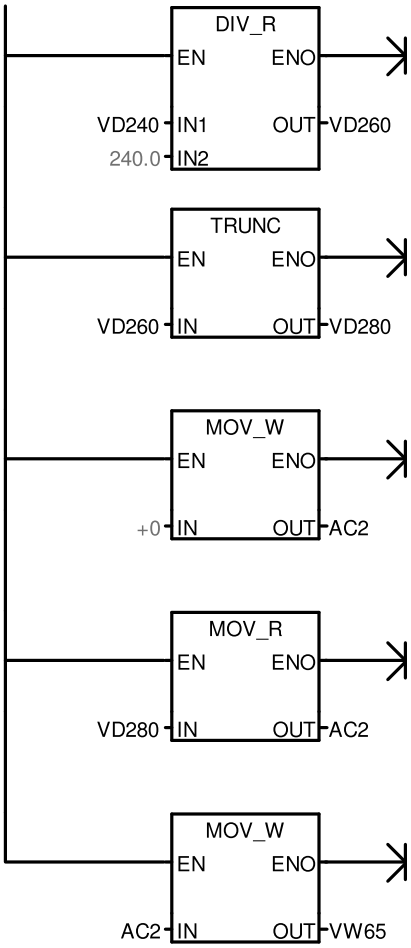

DIV_R
EN
ENO
VD340
IN1
OUT
VD360
32.0
IN2
TRUNC
EN
ENO
VD360
IN
OUT
VD380
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_R
EN
ENO
VD380
IN
OUT
AC2
MOV_W
EN
ENO
AC2
IN
OUT
VW45

Network 3 Pressure Signal

NETWORK COMMENTS

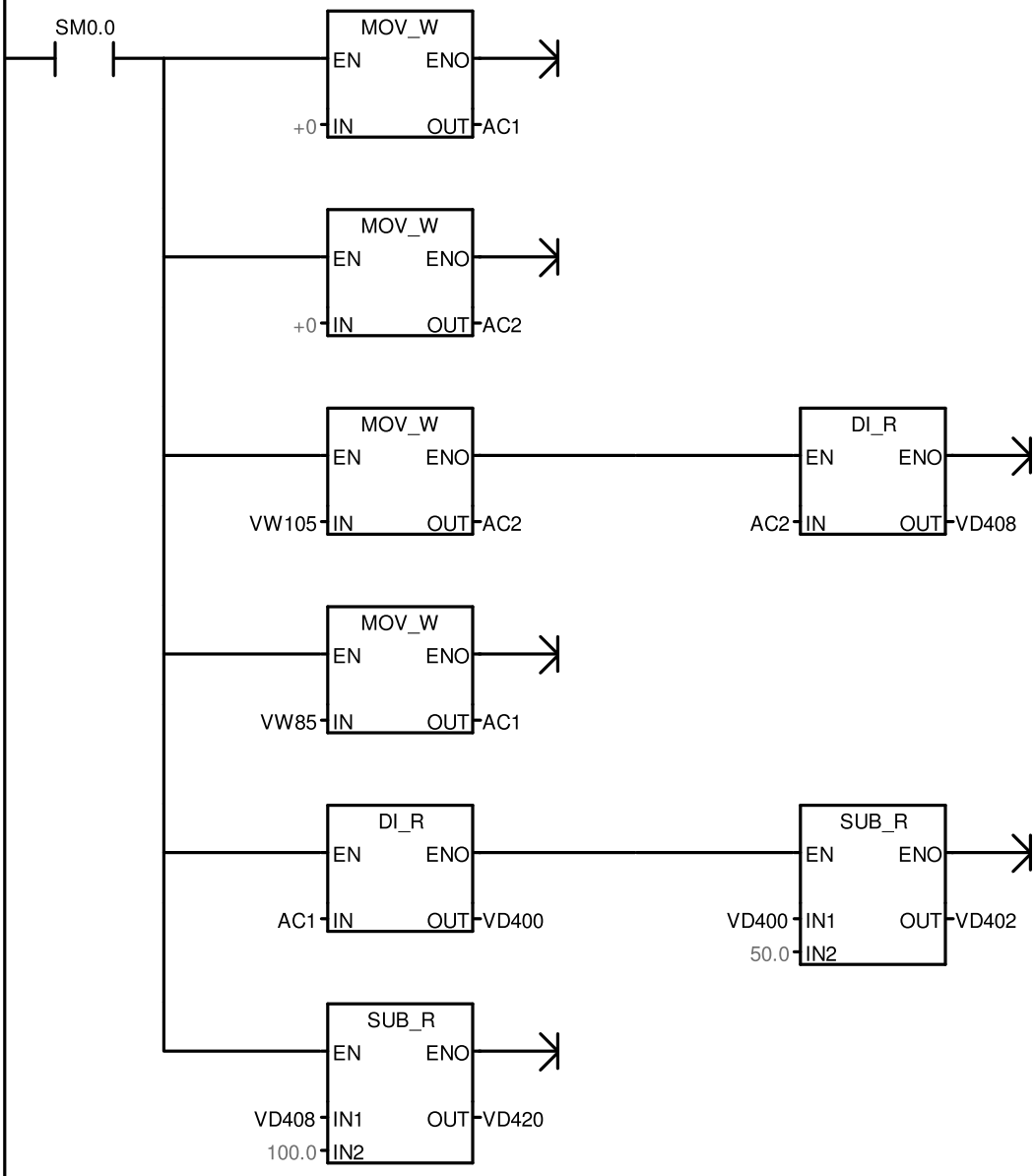
This rung is the analog control for the PUMP STATION flow




DIV_R
EN
ENO
VD240
IN1
OUT
VD260
240.0
IN2
TRUNC
EN
ENO
VD260
IN
OUT
VD280
MOV_W
EN
ENO
+0
IN
OUT
AC2
MOV_R
EN
ENO
VD280
IN
OUT
AC2
MOV_W
EN
ENO
AC2
IN
OUT
VW65

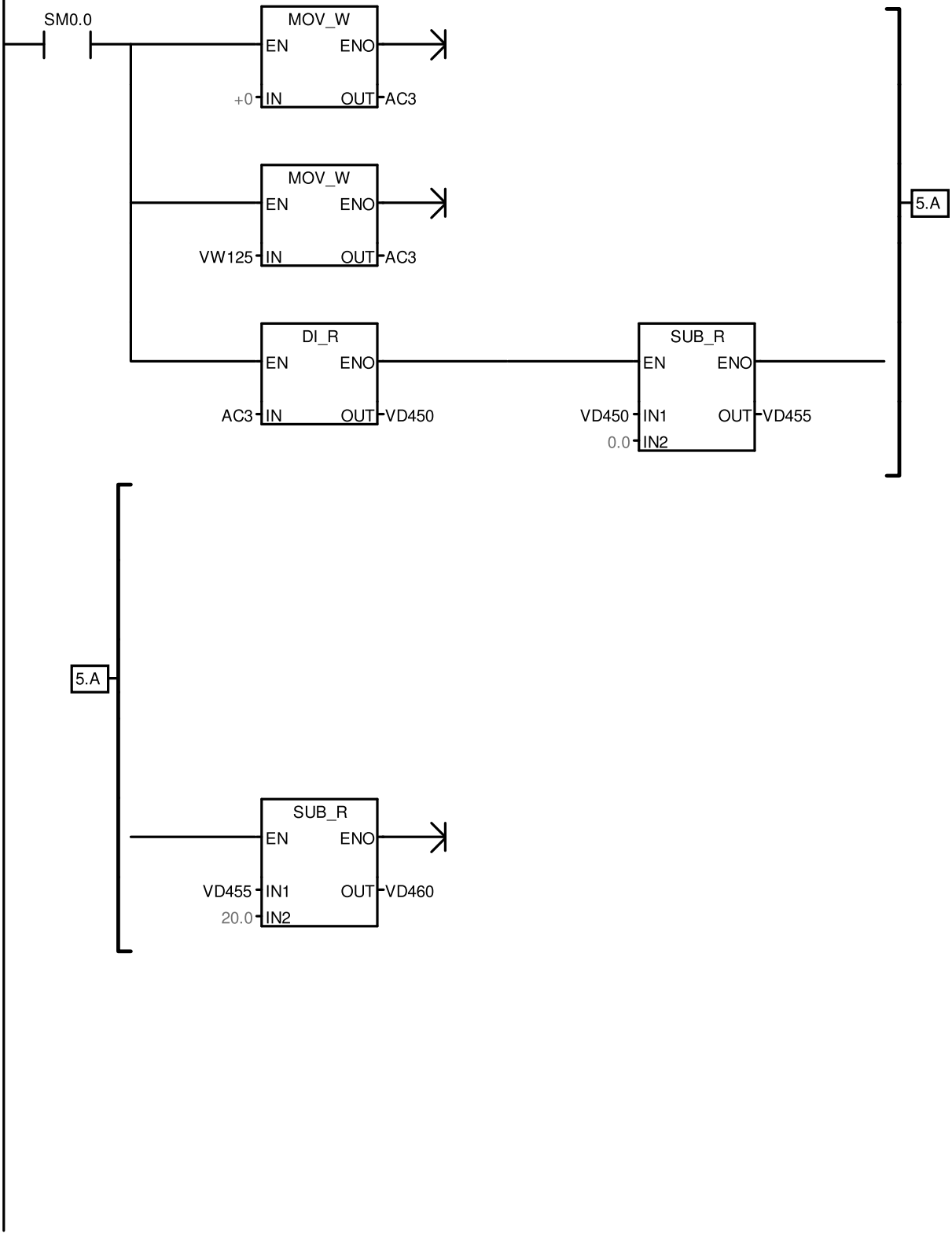
Network 4 Pump 2 & 3 Flow Control

This is the setpoints for Pumps 2 & 3 flowcontrol



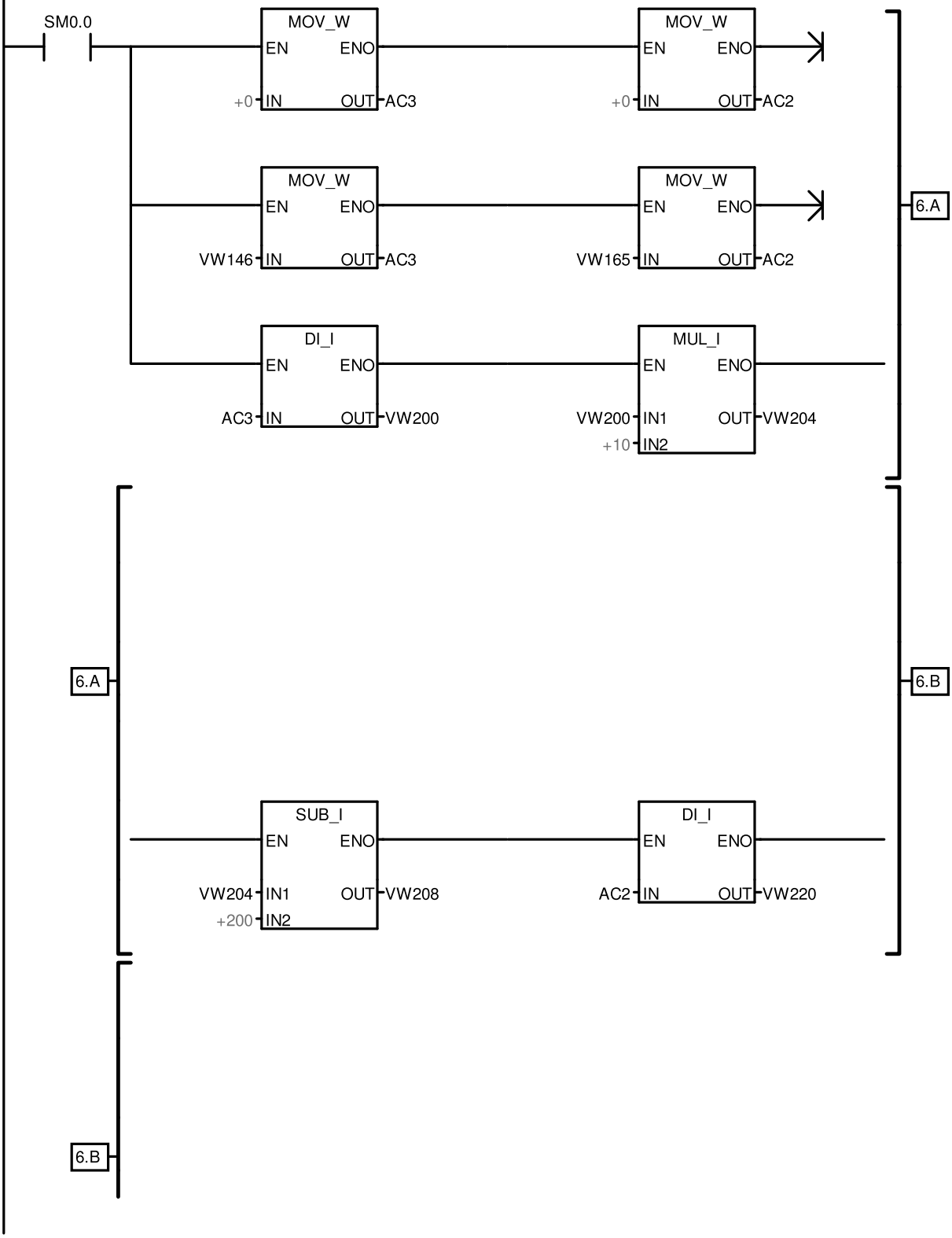
Network 5 Pump 2 & 3 Pressure Control

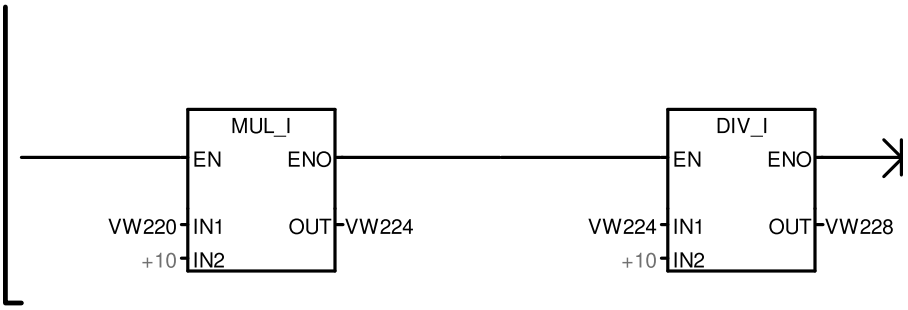
This is the setpoints for Pumps 2 & 3 Pressure control



Network 6 Pump 2 & 3 On/Off delay Control

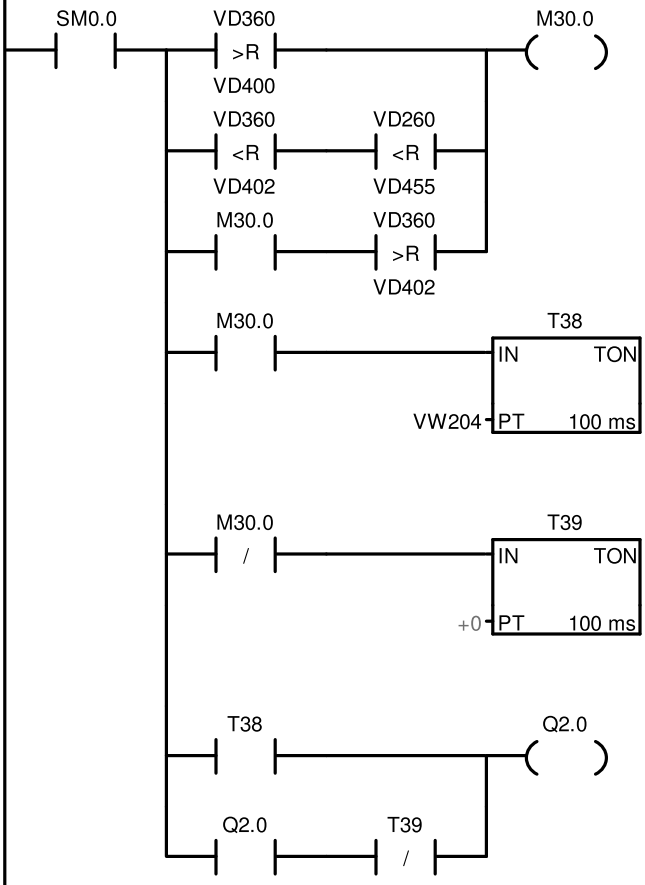
This is the ON\OFF Time Delay for Pumps 2 & 3 control





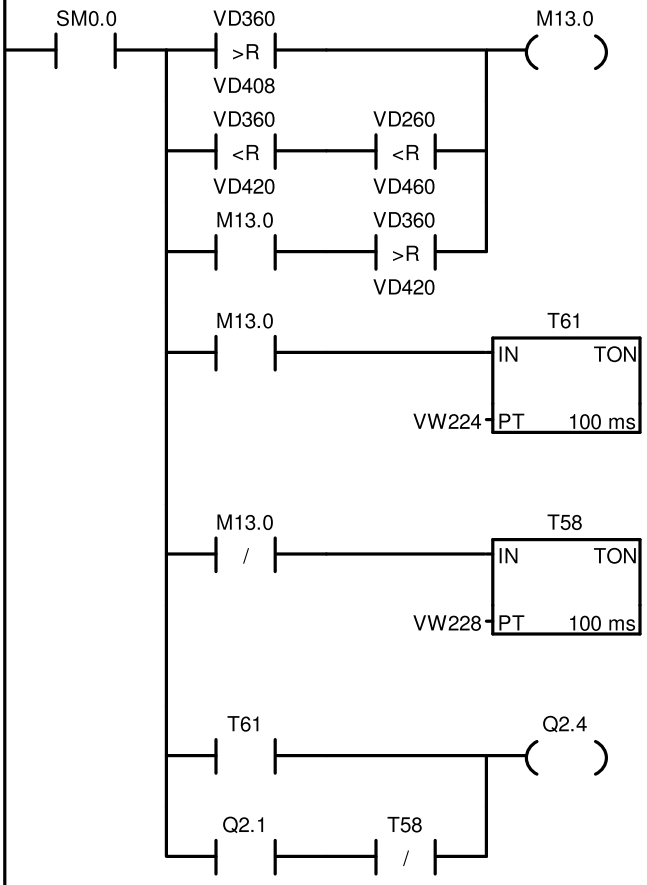
Network 7 Pump 2 (20Hp) Control

This is the setpoint control for the number 2 pump



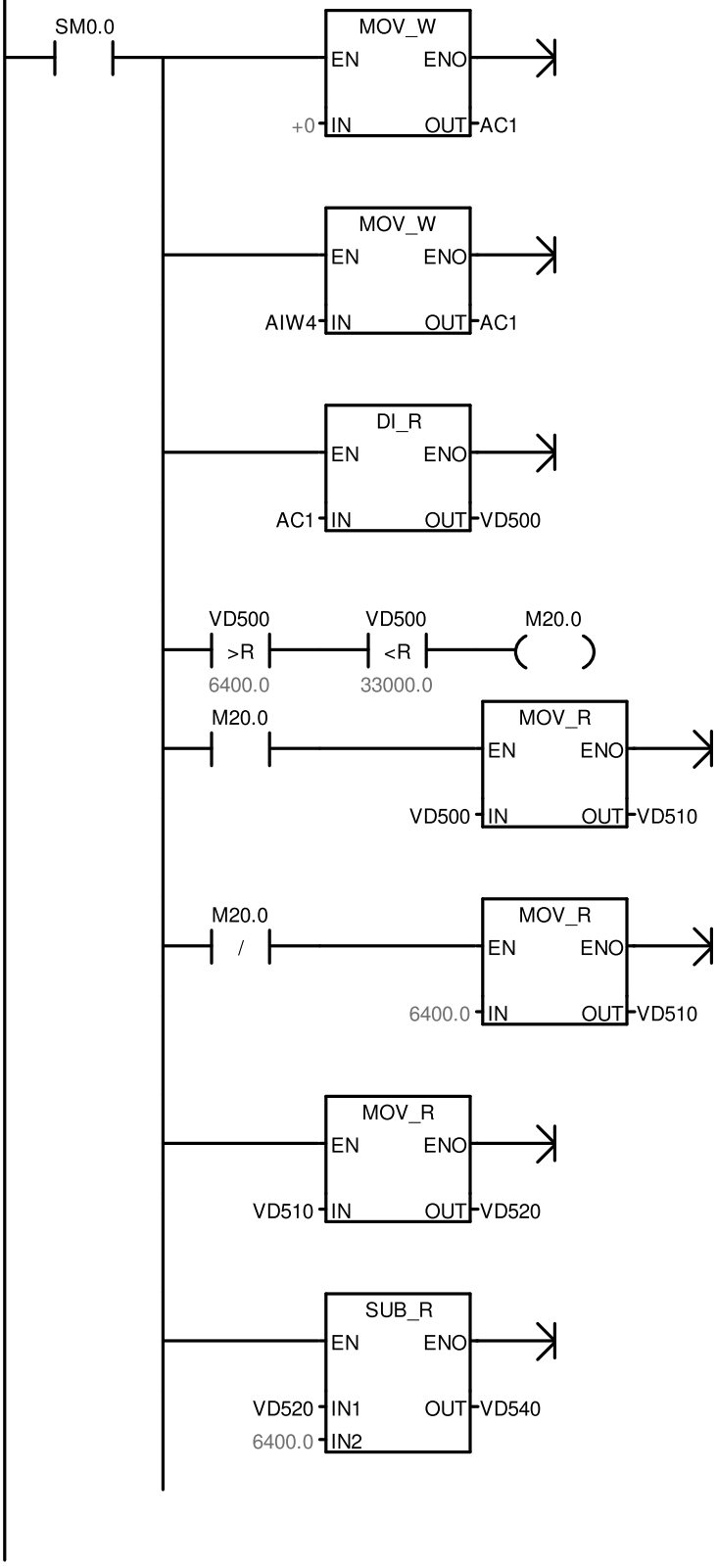
Network 8 Pump 3 (Fire) Control

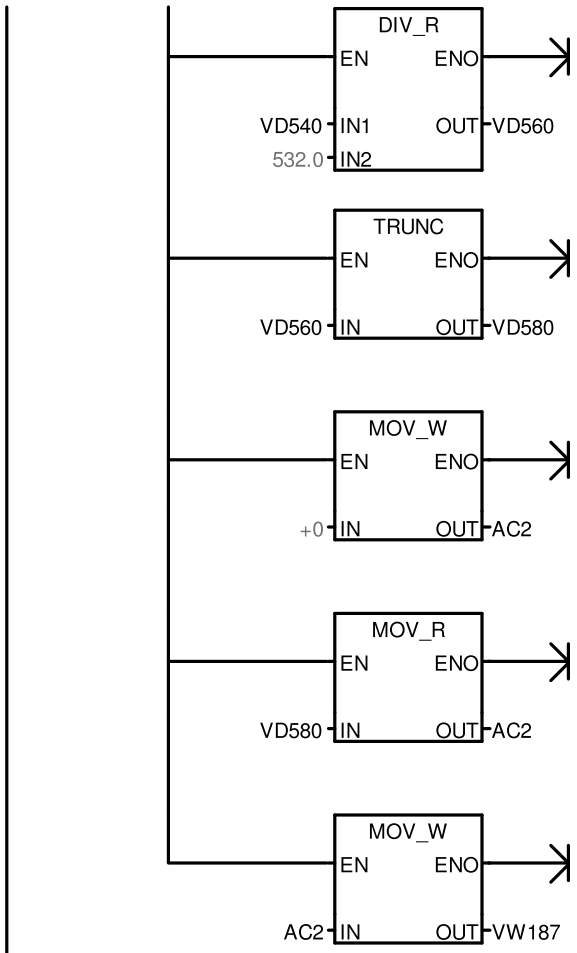
This is the setpoint control for the number 3 (Fire) pump



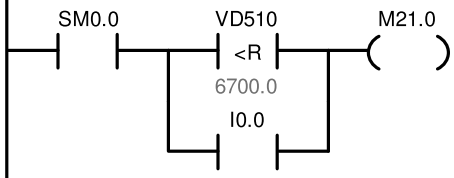
Network 9 NETWORK TITLE (single line)

NETWORK COMMENTS

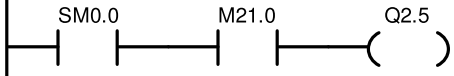




Network 10



Network 11



Block: SBR_0
Author:
Created: 05/24/2018 11:13:53 am
Last Modified: 05/24/2018 11:14:38 am

Symbol	Var Type	Data Type	Comment
EN	IN	BOOL	
	IN		
	IN_OUT		
	OUT		
	TEMP		

SUBROUTINE COMMENTS
Press F1 for help and example program

SUBROUTINE COMMENTS
Press F1 for help and example program

Network 1 NETWORK TITLE (single line)

NETWORK COMMENTS

Block: INT_0
Author:
Created: 05/24/2018 11:13:53 am
Last Modified: 05/24/2018 11:14:38 am

Symbol	Var Type	Data Type	Comment
	TEMP		
	TEMP		
	TEMP		
	TEMP		

INTERRUPT ROUTINE COMMENTS
Press F1 for help and example program

INTERRUPT ROUTINE COMMENTS
Press F1 for help and example program

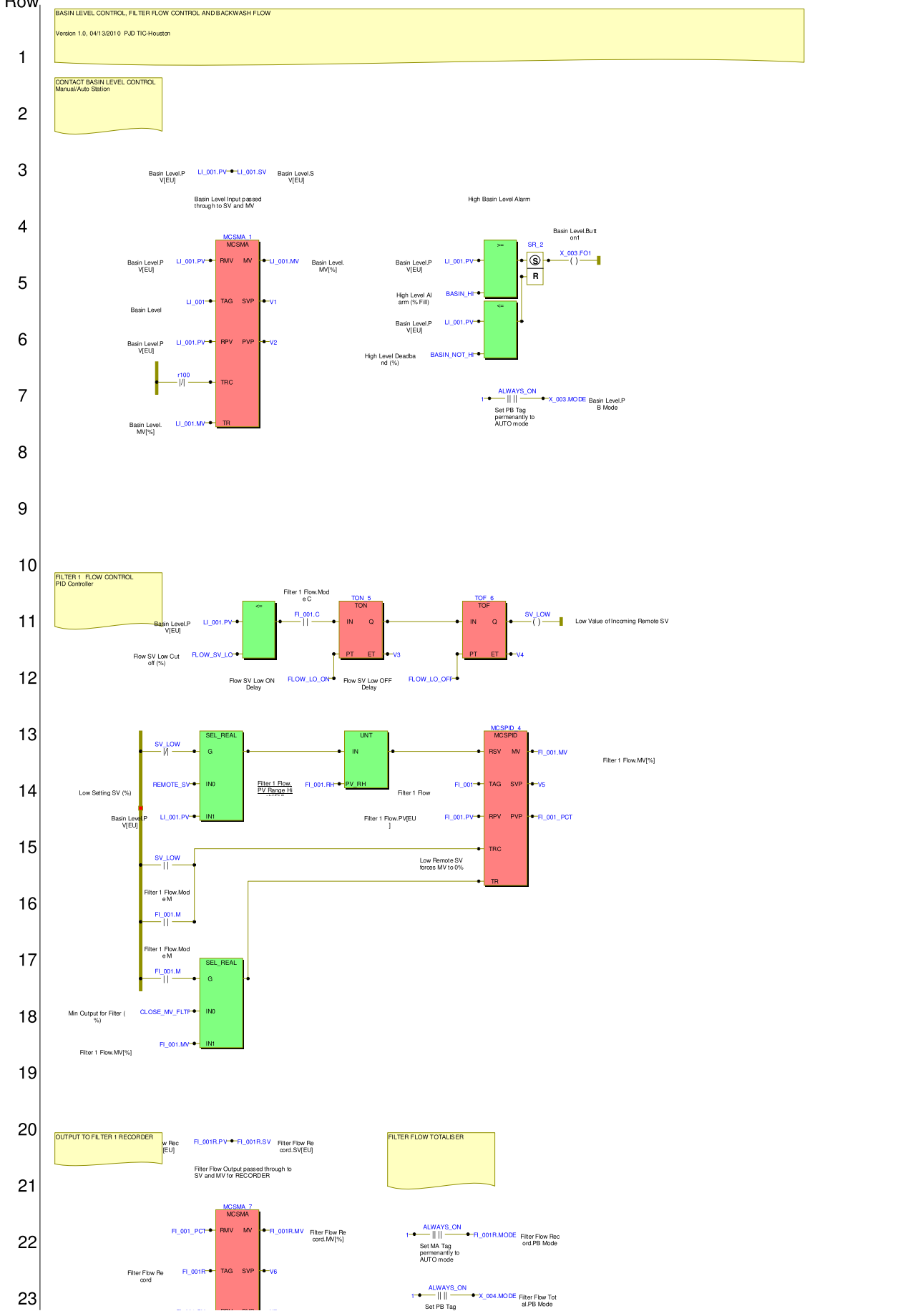
Network 1 NETWORK TITLE (single line)

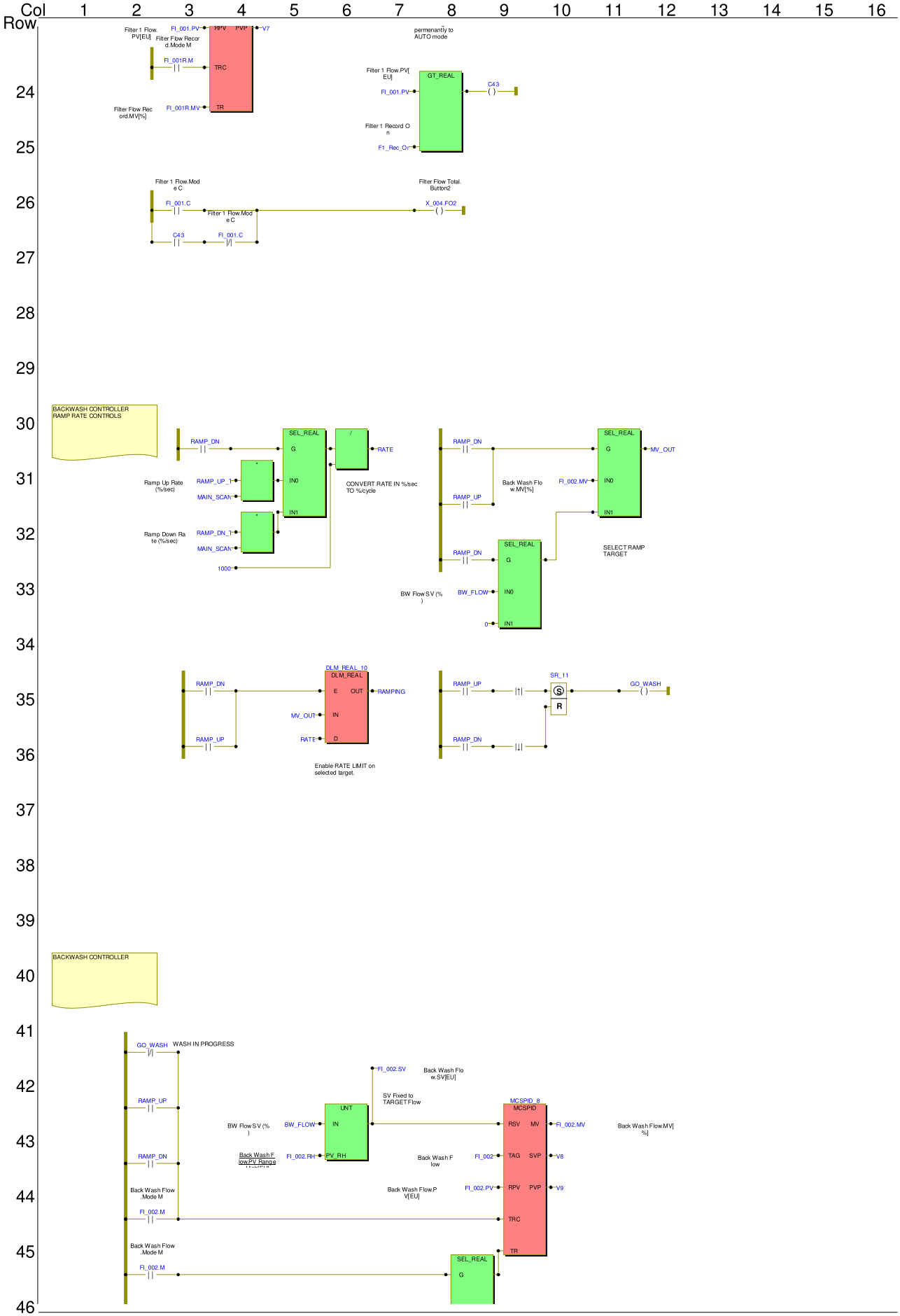
NETWORK COMMENTS

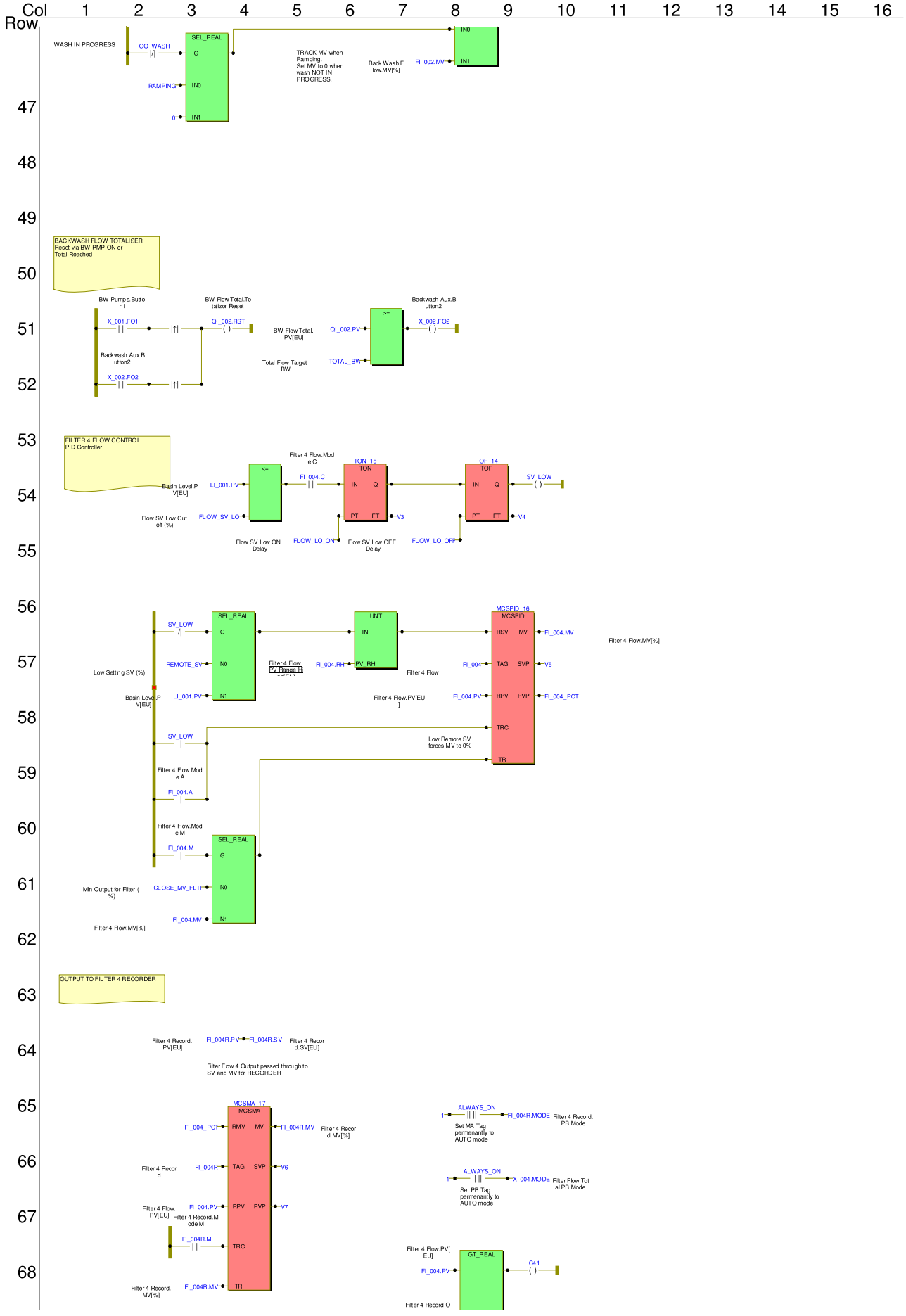
Water Plant Feed Control

Siemans S700 PLC I/O

Influent Flow	AIW0
Effluent Flow	AIW2
Influent Flow to Recorder	AQW16
Ach Feeder	AQW0
Cpoly Feed	AQW4
Filter Aid Feed	AQW6
Flouride Feed Limit	VD1240
Flouride Feed	AQW8
Pre Chlorine Feed	AQW10
Post Chlorine Feed	AQW12


Col 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Row
BASIN LEVEL CONTROL, FILTER FLOW CONTROL AND BACKWASH FLOW
Version 1.0, 04/13/2010 PJD TIC-Houston
CONTACT BASIN LEVEL CONTROL
Manual/Auto Station
Basin Level.PV[EU]
LI_001.PV
LI_001.SV
Basin Level.SV[EU]
Basin Level Input passed through to SV and MV
MCSMA_1
MCSMA
RMV
MV
TAG
SVP
RPV
PVP
TRC
TR
Basin Level
r100
Basin Level.MV[%]
High Basin Level Alarm
Basin Level.Button1
SR_2
X_003.FO1
High Level Alarm (% Fill)
BASIN_HI
BASIN_NOT_HI
High Level Deadband (%)
ALWAYS_ON
X_003.MODE
Basin Level.PB Mode
Set PB Tag permenantly to AUTO mode
FILTER 1 FLOW CONTROL
PID Controller
Filter 1 Flow.Mode C
FI_001.C
TON_5
TON
TOF_6
TOF
IN
Q
PT
ET
SV_LOW
Low Value of Incoming Remote SV
Flow SV Low Cut off (%)
FLOW_SV_LO
V3
V4
Flow SV Low ON Delay
FLOW_LO_ON
Flow SV Low OFF Delay
FLOW_LO_OFF
MCSPID_4
MCSPID
SEL_REAL
UNT
Filter 1 Flow.MV[%]
REMOTE_SV
Low Setting SV (%)
IN0
IN1
Filter 1 Flow.PV Range Hi
FI_001.RH
PV_RH
Filter 1 Flow
FI_001
FI_001.MV
FI_001_PCT
V5
Filter 1 Flow.PV[EU]
Low Remote SV forces MV to 0%
Filter 1 Flow.Mode M
FI_001.M
Min Output for Filter (%)
CLOSE_MV_FLTR
OUTPUT TO FILTER 1 RECORDER
FI_001R.PV
FI_001R.SV
Filter Flow Record.SV[EU]
Filter Flow Output passed through to SV and MV for RECORDER
FILTER FLOW TOTALISER
MCSMA_7
FI_001R.MV
Filter Flow Record.MV[%]
Filter Flow Record
FI_001R
V6
ALWAYS_ON
FI_001R.MODE
Filter Flow Record.PB Mode
Set MA Tag permenantly to AUTO mode
X_004.MODE
Filter Flow Total.PB Mode
Set PB Tag


Col 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Row 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Filter 1 Flow. PV[EU]
FI_001.PV
Filter Flow Record.Mode M
RPV
PVP
V7
FI_001R.M
TRC
Filter Flow Record.MV[%]
FI_001R.MV
TR
permenantly to AUTO mode
Filter 1 Flow.PV[EU]
GT_REAL
C43
FI_001.PV
Filter 1 Record On
F1_Rec_On
Filter 1 Flow.Mode C
FI_001.C
Filter Flow Total. Button2
X_004.FO2
Filter 1 Flow.Mode C
C43
FI_001.C
BACKWASH CONTROLLER RAMP RATE CONTROLS
RAMP_DN
SEL_REAL
G
IN0
IN1
/
RATE
Ramp Up Rate (%/sec)
RAMP_UP_1
MAIN_SCAN
Ramp Down Rate (%/sec)
RAMP_DN_1
1000
CONVERT RATE IN %/sec TO %/cycle
RAMP_UP
Back Wash Flow.MV[%]
FI_002.MV
MV_OUT
SELECT RAMP TARGET
BW Flow SV (%)
BW_FLOW
0
DLM_REAL_10
DLM_REAL
E
OUT
IN
D
RAMPING
MV_OUT
RATE
Enable RATE LIMIT on selected target.
SR_11
S
R
GO_WASH
BACKWASH CONTROLLER
WASH IN PROGRESS
FI_002.SV
Back Wash Flow.SV[EU]
SV Fixed to TARGET Flow
UNT
IN
PV_RH
FI_002.RH
Back Wash Flow.PV Range
MCSPID_8
MCSPID
RSV
MV
FI_002.MV
Back Wash Flow.MV[%]
TAG
SVP
V8
Back Wash Flow
RPV
PVP
V9
FI_002.PV
Back Wash Flow.PV[EU]
TRC
TR
Back Wash Flow .Mode M
FI_002.M


Col 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Row
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
WASH IN PROGRESS
GO_WASH
SEL_REAL
G
RAMPING
IN0
0
IN1
TRACK MV when Ramping. Set MV to 0 when wash NOT IN PROGRESS.
Back Wash Flow.MV[%]
FI_002.MV
BACKWASH FLOW TOTALISER Reset via BW PMP ON or Total Reached
BW Pumps Button1
X_001.FO1
BW Flow Total.Totalizor Reset
QI_002.RST
Backwash Aux.Button2
X_002.FO2
BW Flow Total.PV[EU]
QI_002.PV
>=
Total Flow Target BW
TOTAL_BW
FILTER 4 FLOW CONTROL PID Controller
Basin Level.PV[EU]
LI_001.PV
<=
Flow SV Low Cut off (%)
FLOW_SV_LO
Filter 4 Flow.Mode C
FI_004.C
TON_15
TON
IN
Q
PT
ET
V3
Flow SV Low ON Delay
FLOW_LO_ON
TOF_14
TOF
V4
Flow SV Low OFF Delay
FLOW_LO_OFF
SV_LOW
Low Setting SV (%)
REMOTE_SV
Filter 4 Flow. PV Range Hi
FI_004.RH
PV_RH
UNT
MCSPID_16
MCSPID
RSV
MV
FI_004.MV
Filter 4 Flow.MV[%]
TAG
SVP
V5
Filter 4 Flow
FI_004
RPV
PVP
FI_004.PV
FI_004_PCT
Filter 4 Flow.PV[EU]
TRC
TR
Low Remote SV forces MV to 0%
Filter 4 Flow.Mode A
FI_004.A
Filter 4 Flow.Mode M
FI_004.M
Min Output for Filter (%)
CLOSE_MV_FLTR
OUTPUT TO FILTER 4 RECORDER
Filter 4 Record.PV[EU]
FI_004R.PV
FI_004R.SV
Filter 4 Record.SV[EU]
Filter Flow 4 Output passed through to SV and MV for RECORDER
MCSMA_17
MCSMA
RMV
FI_004_PCT
FI_004R.MV
Filter 4 Record.MV[%]
FI_004R
Filter 4 Record
V6
Filter 4 Flow.PV[EU]
Filter 4 Record.Mode.M
FI_004.PV
V7
FI_004R.M
Filter 4 Record.MV[%]
ALWAYS_ON
FI_004R.MODE
Filter 4 Record.PB Mode
Set MA Tag permenantly to AUTO mode
X_004.MODE
Filter Flow Total.PB Mode
Set PB Tag permenantly to AUTO mode
GT_REAL
C41
Filter 4 Record O

Col 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Row

69

n
F4_Rec_Or

70

Filter 4 Flow.Mode C
FI_004.C
Filter Flow Total. Button3
X_004.FO3
( )

71

Filter 4 Flow.Mode C
C41
FI_004.C
|/|

72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91

UNit #2 Toshiba Connections for Backwash & Filter ProgramToshiba Unit #2

POINT	POINT TYPE	TAG TYPE	TAG NAME	TAG ID	EXPANDED ID	MODULE	POINT	TERM+	TERM_	B_U_M_P	Wire No.+	Wire Non -
1	AI	MA	LI_001	PV	BASIN LEVEL	0	1	2	1	00_01_01_00_01	874	875
2	AI	PID	FI_002	PV	FILTER 2 FLOW	0	2	4	3	00_01_01_00_02	817	819
3	AI	PID	F2_002	PV	BACKWASH FLOW	0	3	6	5	00_01_01_00_03	862	861
4	AO	MA	LI_001	MV	CB REMOTE SP OU	1	1	2	1	00_01_01_01_01	510	509
5	AO	PID	F2_002	MV	FILTER 2 VALVE POSITION	1	2	4	3	00_01_01_01_02	856	855
6	AO	PID	FI_002	MV	BW VFD SPEED OUTPUT	1	3	6	5	00_01_01_01_03	871	869
7	AO	MA	FI_002R	MV	FILTER 2 OUTPUT REC	1	5	10	9	00_01_01_01_05	822	823
8	DI	PB	N_001	FI1	START BACKWASH	2	1	A1	B10	00_01_01_02_01	DI1 776	
9	DI	PB	N_001	FI2	EXTEND BACKWASH	2	2	A2	B10	00_01_01_02_02	DI2 799	
10	DO	PB	X_001	FO1	BACKWASH PUMP	3	1	A1	B10	00_01_01_03_01	DO1 776	R1
11	DO	PB	X_002	FO1	PULSE TO STEPPER	3	2	A2	B10	00_01_01_03_02	DO3 735	R2
12	DO	PB	X_001	FO2	SW PUMP	3	3	A3	B10	00_01_01_03_03	DO2	R3
13	DO	PB	X_002	FO2	BACKWASH TOTALIZER	3	4	A4	B10	00_01_01_03_04	DO4 865	R4
14	DO	PB	X_003	FO1	HIGH BASIN LEVEL ALARM	3	5	A5	B10	00_01_01_03_05	DO5	R5 & R8
15	DO	PB	X_004	FO1	FILTER TOTALIZER PULSE	3	6	A6	B10	00_01_01_03_06		
16	DO	PB	X_004	FO2	FILTER 2 RECDATA ON	3	8	A8	B10	00_01_01_03_08	DO8	R6
NEW												
19	AI	PID	FI_003	PV	FILTER 3 FLOW	0	6	14	13	00_01_01_00_06	828	830
20	AO	MA	FI_003R	MV	FILTER 3 OUTPUT REC	1	4	8	7	00_01_01_01_04	833	834
22	AO	PID	FI_003	MV	FILTER 3 VALVE POSITION	1	7	14	13	00_01_01_01_07	858	857
23	DO	PB	X_004	FO3	FILTER 3 RECDATA ON	3	7	A7	B10	00_01_01_03_07	DO7	R7