

PID Configuration

PID - Rung #2:22 - PD15:0

Controller Gain, Kc: 0.4	Setpoint: 40
Reset Term, Ti: 0.10	Setpoint MAX(Smax): 100
Rate Term, Td: 0.00	Setpoint MIN(Smin): 0
Loop Update Time: 0.25	Process Variable PV: 0
Control Mode: E = SP - PV	Control Output CV (%): 0
PID Control: Auto	Output Max CV(%): 100
Time Mode: STI	Output Min CV(%): 0
Limit Output CV: Yes	Scaled Error: 0
Deadband: 0	Feed Forward Bias: 0

PID - Rung #2:25 - PD15:1

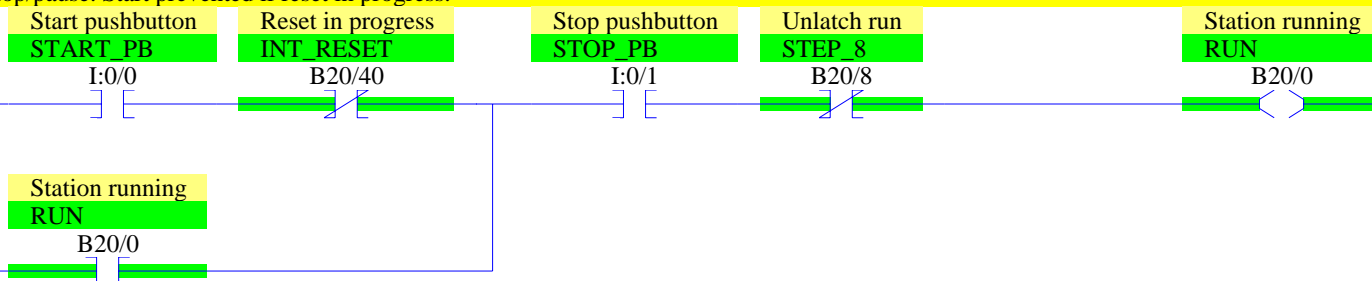
Controller Gain, Kc: 0.4	Setpoint: 40
Reset Term, Ti: 0.10	Setpoint MAX(Smax): 100
Rate Term, Td: 0.00	Setpoint MIN(Smin): 0
Loop Update Time: 0.25	Process Variable PV: 0
Control Mode: E = SP - PV	Control Output CV (%): 0
PID Control: Auto	Output Max CV(%): 100
Time Mode: STI	Output Min CV(%): 0
Limit Output CV: Yes	Scaled Error: 0
Deadband: 0	Feed Forward Bias: 0

Example 7.6 - Simple Batch Control

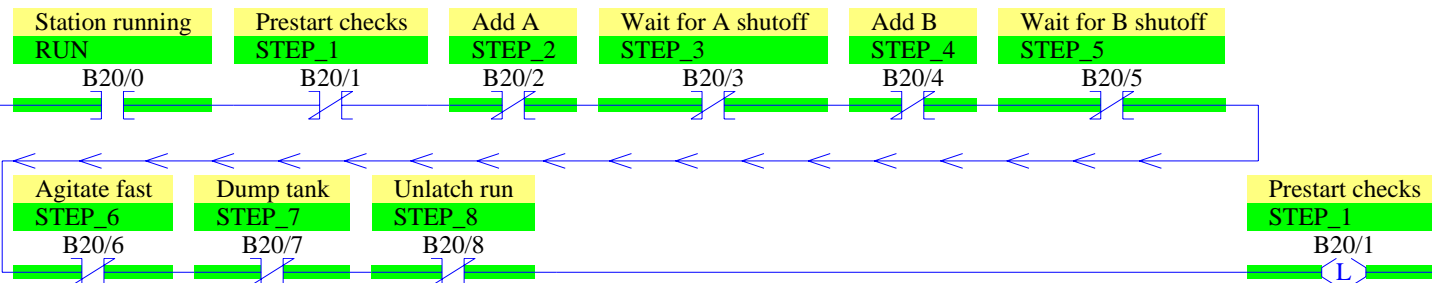
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Start/stop/pause. Start prevented if reset in progress.

0000

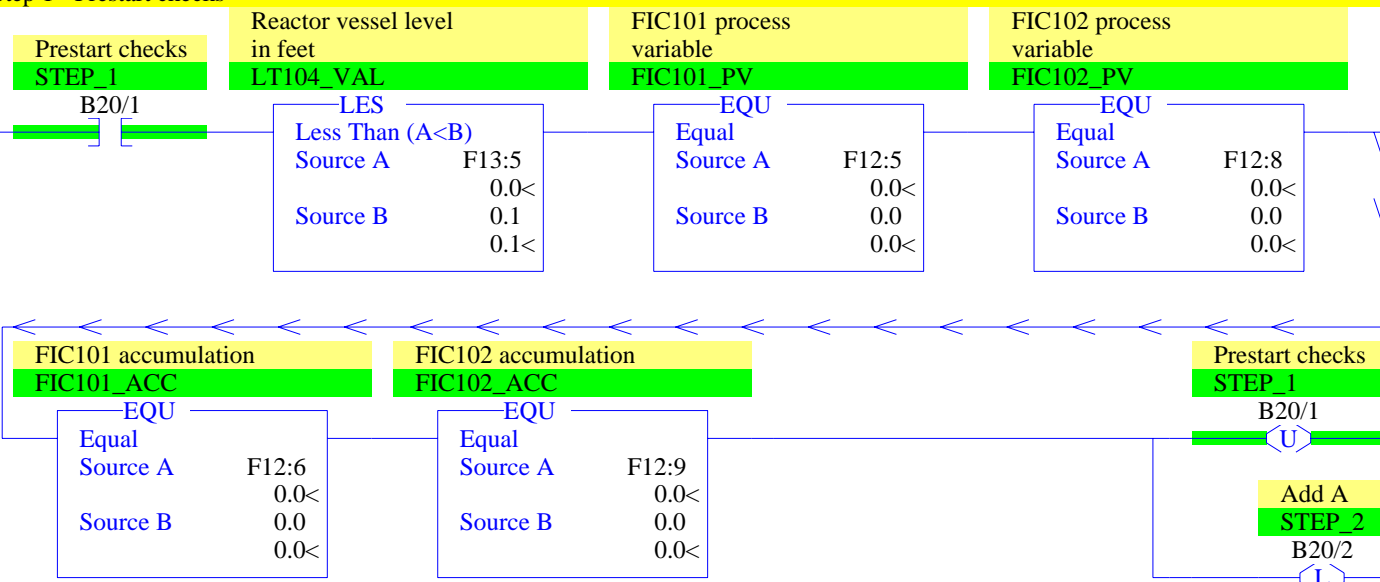


0001



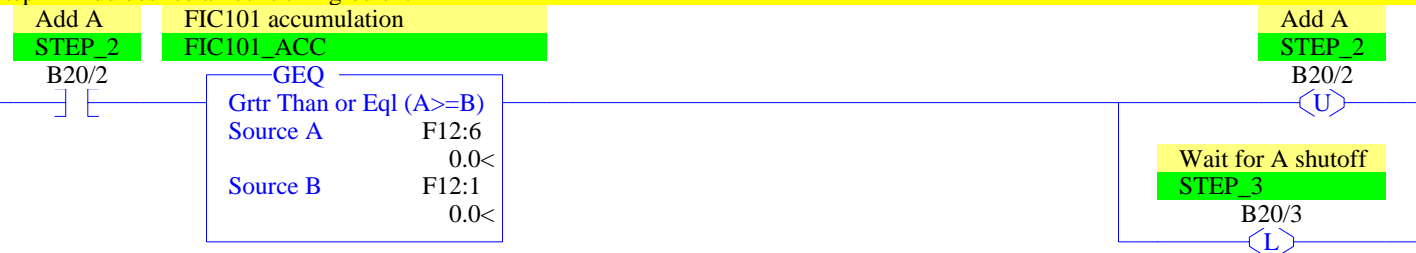
0002

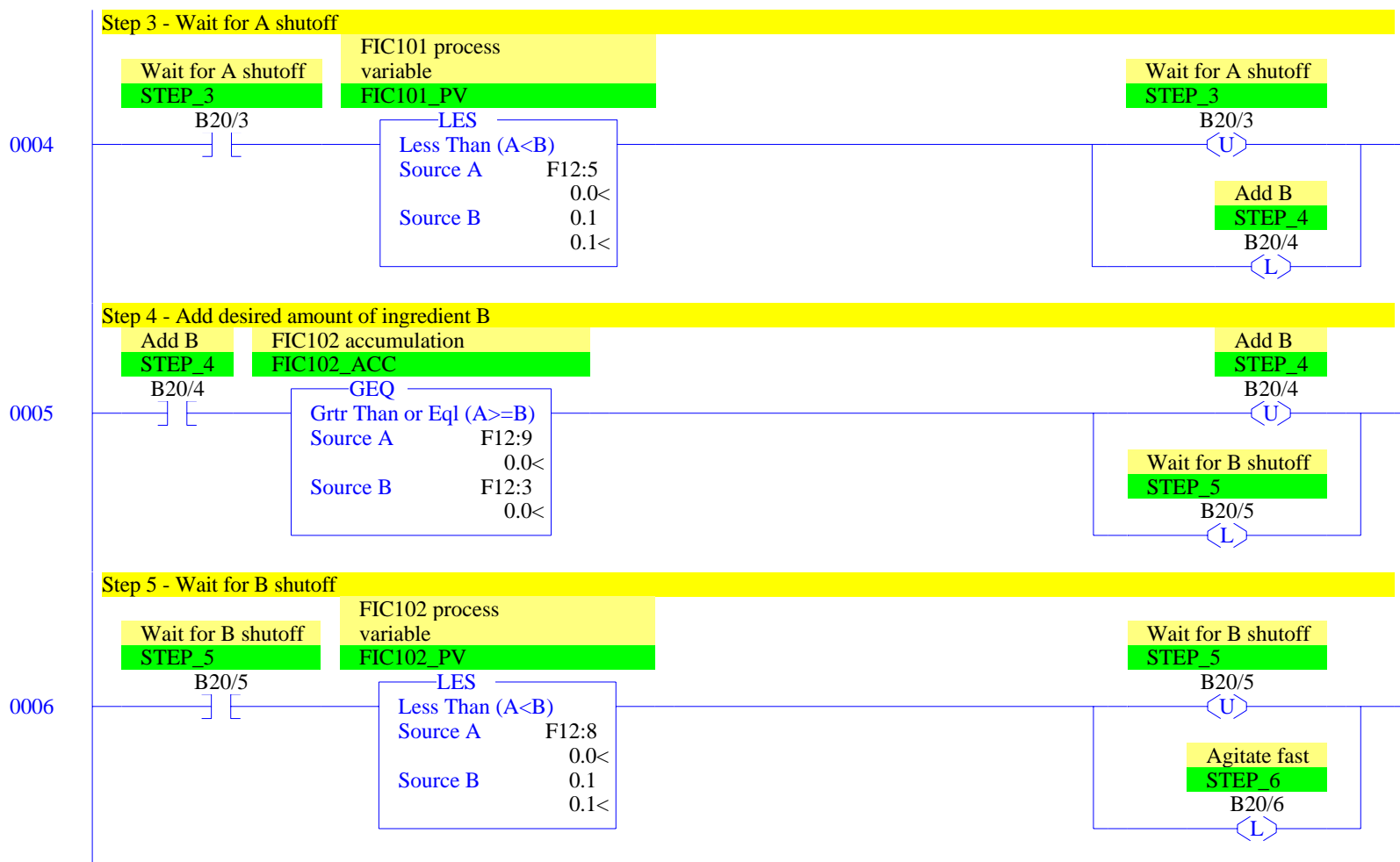
Step 1 - Prestart checks

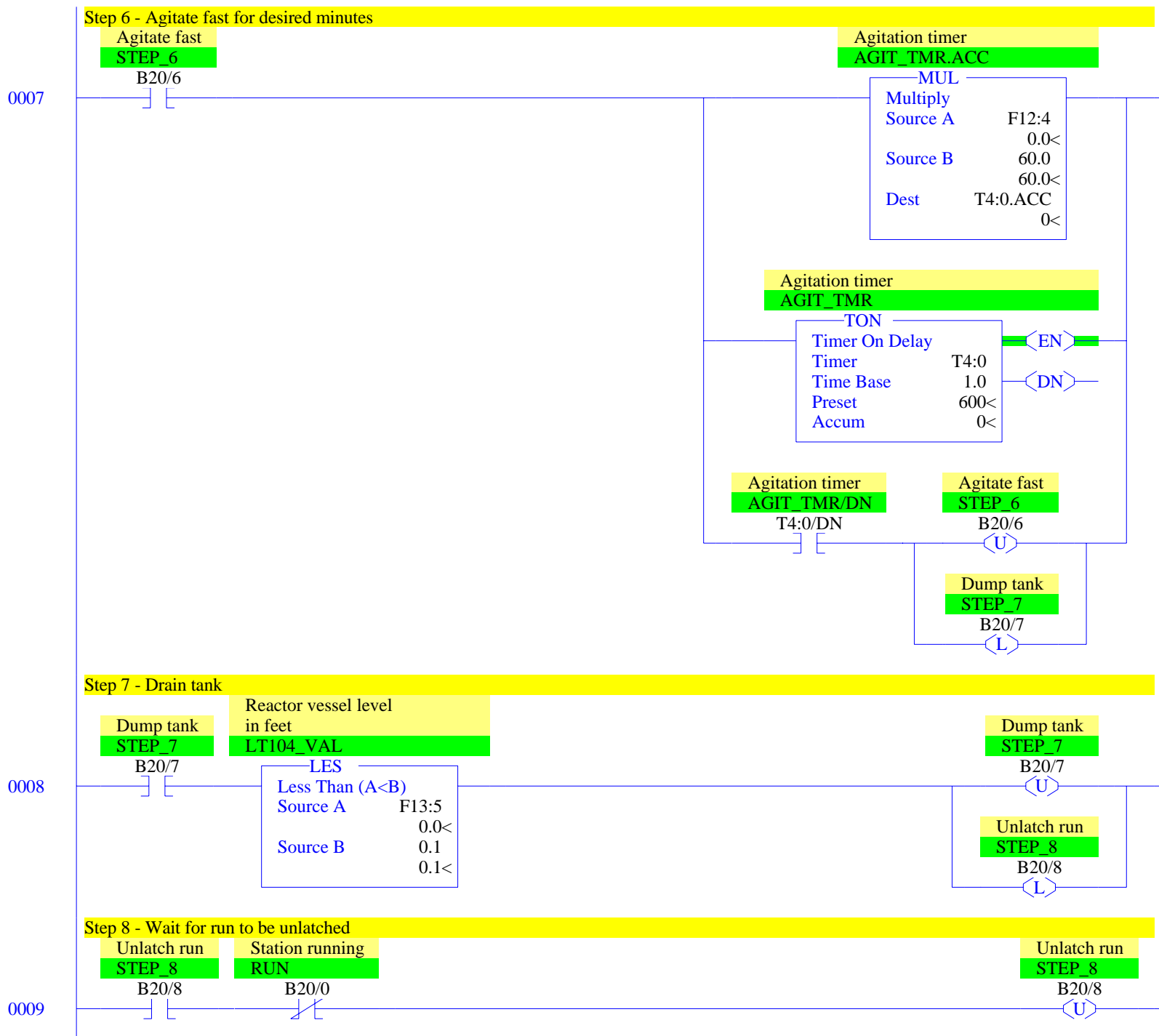


0003

Step 2 - Add desired amount of ingredient A







Convert level measurement into units of feet. SCP can only work with integer destination. Use SCP to convert to hundredths of feet and then divide by 100 to get level in feet.

0010

SCP	
Scale w/Parameters	
Input	I:1.0
	0<
Input Min.	6241
	6241<
Input Max.	31206
	31206<
Scaled Min.	0
	0<
Scaled Max.	1500
	1500<
Output	N14:5
	0<

Reactor vessel level
in feet

LT104_VAL

MUL	
Multiply	
Source A	N14:5
	0<
Source B	0.01
	0.01<
Dest	F13:5
	0.0<

Reset of accumulators in prestart step

Prestart checks

STEP_1

B20/1

FIC101 accumulation

FIC101_ACC

MOV	
Move	
Source	0.0
	0.0<
Dest	F12:6
	0.0<

FIC102 accumulation

FIC102_ACC

MOV	
Move	
Source	0.0
	0.0<
Dest	F12:9
	0.0<

0011

FIC101 setpoint moves. Set to -2.0 except when filling ingredient A.

Add A

STEP_2

B20/2

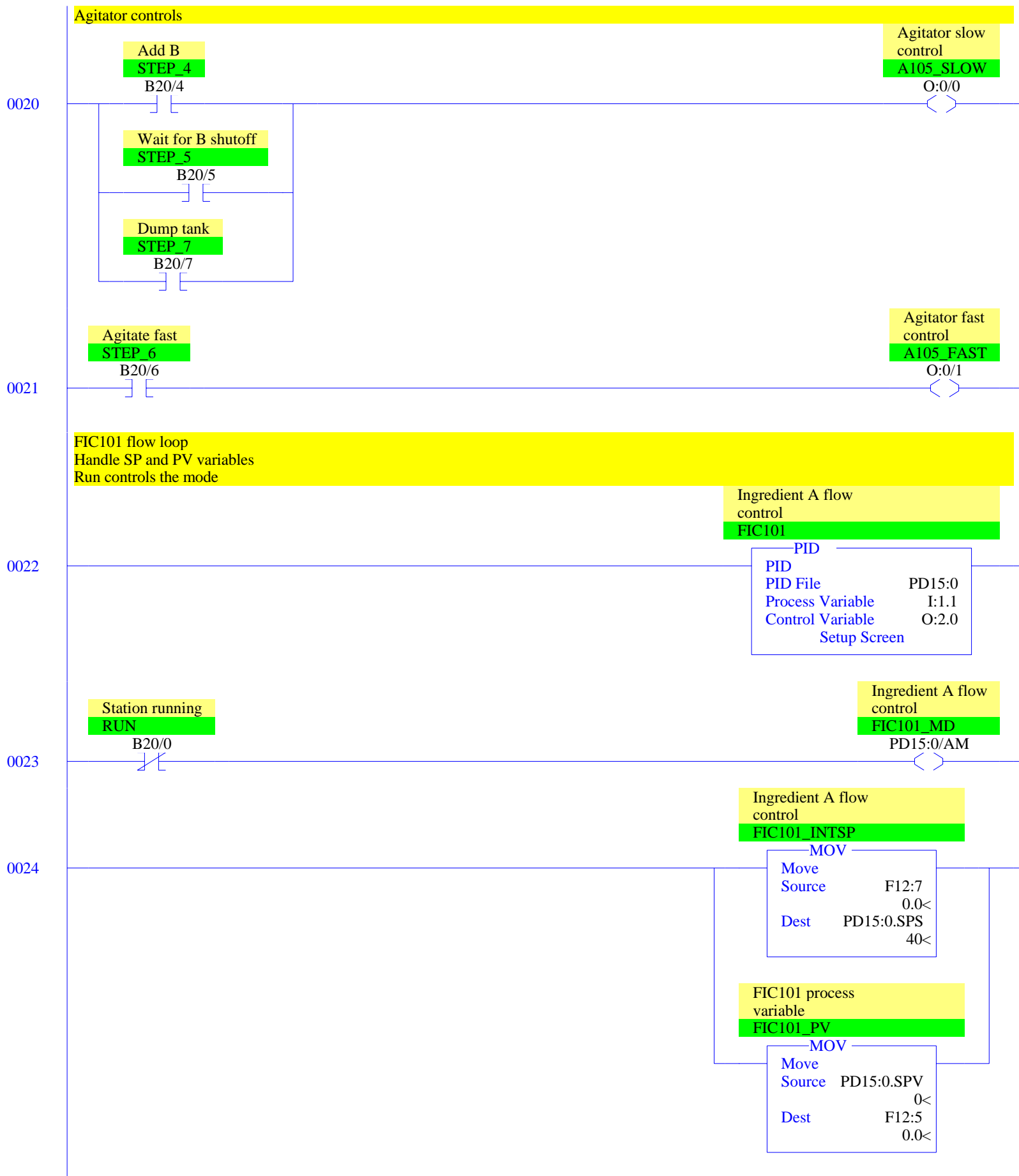
FIC101 setpoint

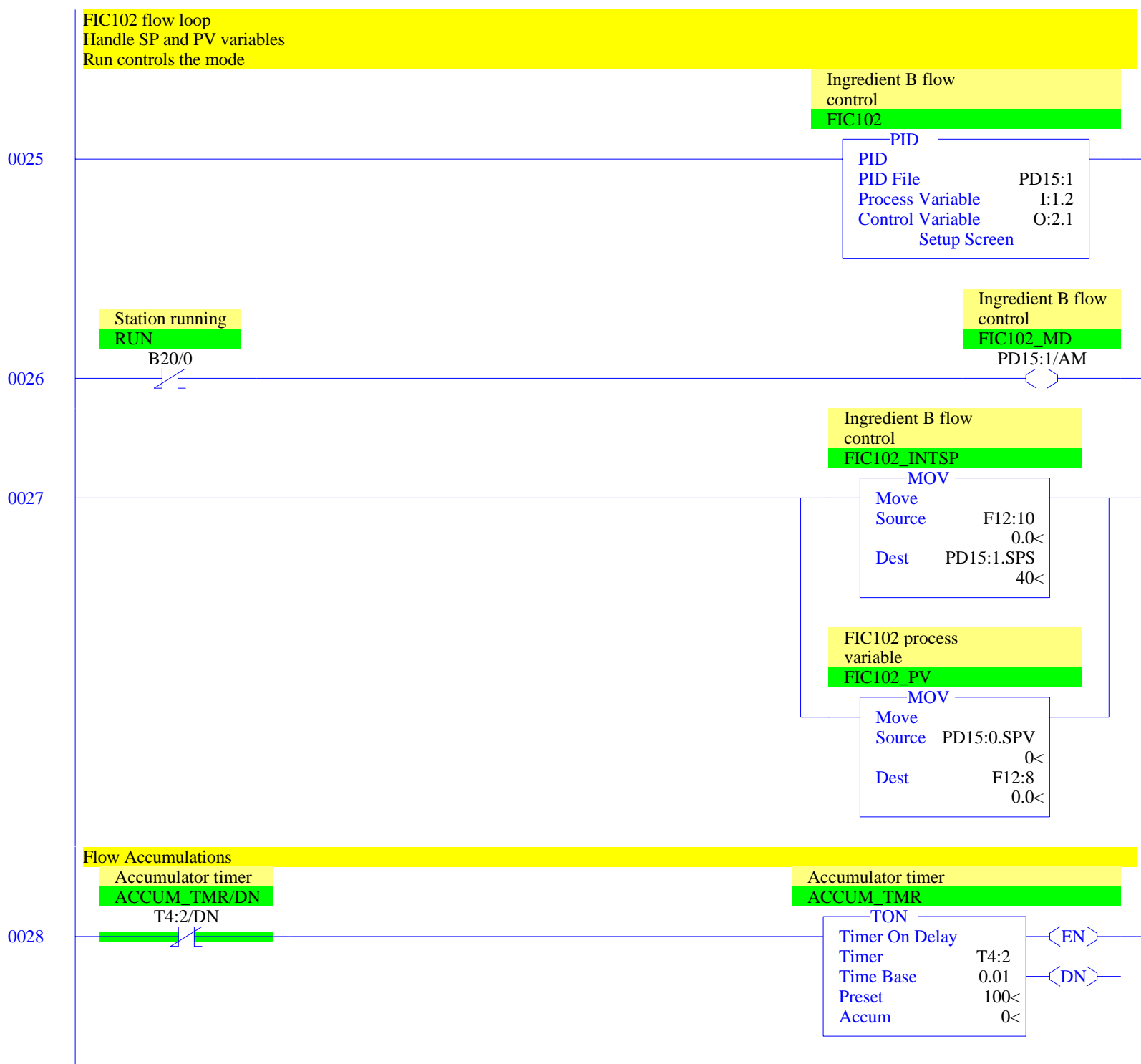
FIC101_SP

MOV	
Move	
Source	F12:0
	0.0<
Dest	F12:7
	0.0<

0012







0029

Accumulator timer

ACCUM_TMR/DN

T4:2/DN

Used in calculation
of accumulations

TEMP_ACC

DIV

Divide

Source A F12:5
0.0<Source B 60.0
60.0<Dest F12:11
0.0<

FIC101 accumulation

FIC101_ACC

ADD

Add

Source A F12:6
0.0<Source B F12:11
0.0<Dest F12:6
0.0<Used in calculation
of accumulations

TEMP_ACC

DIV

Divide

Source A F12:8
0.0<Source B 60.0
60.0<Dest F12:11
0.0<FIC102 process
variable

FIC102_PV

ADD

Add

Source A F12:8
0.0<Source B F12:11
0.0<Dest F12:8
0.0<

0030

<END>

RSLogix 500 Cross Reference Report - Sorted by Address

O:0/0	- {A105_SLOW} Agitator slow control OTE - File #2 - 20
O:0/1	- {A105_FAST} Agitator fast control OTE - File #2 - 21
O:0/2	- {XV101_OPEN} XV101 open control OTE - File #2 - 16
O:0/3	- {XV102_OPEN} XV102 open control OTE - File #2 - 17
O:0/4	- {XV103_OPEN} XV102 open control OTE - File #2 - 18
O:0/5	- {P103_RUN} Outlet pump motor control OTE - File #2 - 19
O:2.0	- {FY101} Ingred A flow valve control PID - File #2 - 22
O:2.1	- {FY102} Ingred B flow valve control PID - File #2 - 25
I:0/0	- {START_PB} Start pushbutton XIC - File #2 - 0
I:0/1	- {STOP_PB} Stop pushbutton XIC - File #2 - 0
I:1.0	- SCP - File #2 - 10
I:1.1	- PID - File #2 - 22
I:1.2	- PID - File #2 - 25
T4:0	- {AGIT_TMR} Agitation timer TON - File #2 - 7
T4:0/DN	- XIC - File #2 - 7
T4:0.ACC	- MUL - File #2 - 7
T4:2	- {ACCUM_TMR} Accumulator timer TON - File #2 - 28
T4:2/DN	- XIC - File #2 - 29 XIO - File #2 - 28
F12:0	- {INGA_DES_FLW} Ingredient A desired flow rate MOV - File #2 - 12
F12:1	- {INGA_DES_AMT} Ingredient A desired amount GEQ - File #2 - 3
F12:2	- {INGB_DES_FLW} Ingredient B desired flow rate MOV - File #2 - 14
F12:3	- {INGB_DES_AMT} Ingredient B desired amount GEQ - File #2 - 5
F12:4	- {AGIT_TIME} Agitation time in minutes MUL - File #2 - 7
F12:5	- {FIC101_PV} FIC101 process variable MOV - File #2 - 24 EQU - File #2 - 2 LES - File #2 - 4 DIV - File #2 - 29
F12:6	- {FIC101_ACC} FIC101 accumulation MOV - File #2 - 11 EQU - File #2 - 2 GEQ - File #2 - 3 ADD - File #2 - 29
F12:7	- {FIC101_SP} FIC101 setpoint MOV - File #2 - 12, 13, 24
F12:8	- {FIC102_PV} FIC102 process variable MOV - File #2 - 27 EQU - File #2 - 2 LES - File #2 - 6 DIV - File #2 - 29 ADD - File #2 - 29
F12:9	- {FIC102_ACC} FIC102 accumulation MOV - File #2 - 11 EQU - File #2 - 2 GEQ - File #2 - 5
F12:10	- {FIC102_SP} FIC102 setpoint MOV - File #2 - 14, 15, 27
F12:11	- {TEMP_ACC} Used in calculation of accumulations

RSLogix 500 Cross Reference Report - Sorted by Address

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DIV - File #2 - 29
ADD - File #2 - 29
DIV - File #2 - 29
F13:5    - {LT104_VAL} Reactor vessel level in feet
          LES - File #2 - 2, 8
          MUL - File #2 - 10
N14:5    - SCP - File #2 - 10
          MUL - File #2 - 10
PD15:0   - {FIC101} Ingredient A flow control
          PID - File #2 - 22
PD15:0/AM - {FIC101_MD}
          OTE - File #2 - 23
PD15:0.SPS - {FIC101_INTSP}
          MOV - File #2 - 24
PD15:0.SPV - {FIC101_INTPV}
          MOV - File #2 - 24, 27
PD15:1   - {FIC102} Ingredient B flow control
          PID - File #2 - 25
PD15:1/AM - {FIC102_MD}
          OTE - File #2 - 26
PD15:1.SPS - {FIC102_INTSP}
          MOV - File #2 - 27
B20/0    - {RUN} Station running
          OTE - File #2 - 0
          XIC - File #2 - 0, 1, 16, 17, 18, 19
          XIO - File #2 - 9, 23, 26
B20/1    - {STEP_1} Prestart checks
          OTL - File #2 - 1
          OTU - File #2 - 2
          XIC - File #2 - 2, 11
          XIO - File #2 - 1
B20/2    - {STEP_2} Add A
          OTL - File #2 - 2
          OTU - File #2 - 3
          XIC - File #2 - 3, 12, 16
          XIO - File #2 - 1, 13
B20/3    - {STEP_3} Wait for A shutoff
          OTL - File #2 - 3
          OTU - File #2 - 4
          XIC - File #2 - 4
          XIO - File #2 - 1
B20/4    - {STEP_4} Add B
          OTL - File #2 - 4
          OTU - File #2 - 5
          XIC - File #2 - 5, 14, 17, 20
          XIO - File #2 - 1, 15
B20/5    - {STEP_5} Wait for B shutoff
          OTL - File #2 - 5
          OTU - File #2 - 6
          XIC - File #2 - 6, 20
          XIO - File #2 - 1
B20/6    - {STEP_6} Agitate fast
          OTL - File #2 - 6
          XIC - File #2 - 7, 21
          XIO - File #2 - 1
          OTU - File #2 - 7
B20/7    - {STEP_7} Dump tank
          OTU - File #2 - 8
          XIC - File #2 - 8, 18, 19, 20
          XIO - File #2 - 1
          OTL - File #2 - 7
B20/8    - {STEP_8} Unlatch run
          OTL - File #2 - 8
          OTU - File #2 - 9
          XIC - File #2 - 9
          XIO - File #2 - 0, 1

```

B20/40 - {INT_RESET} Reset in progress
 XIO - File #2 - 0