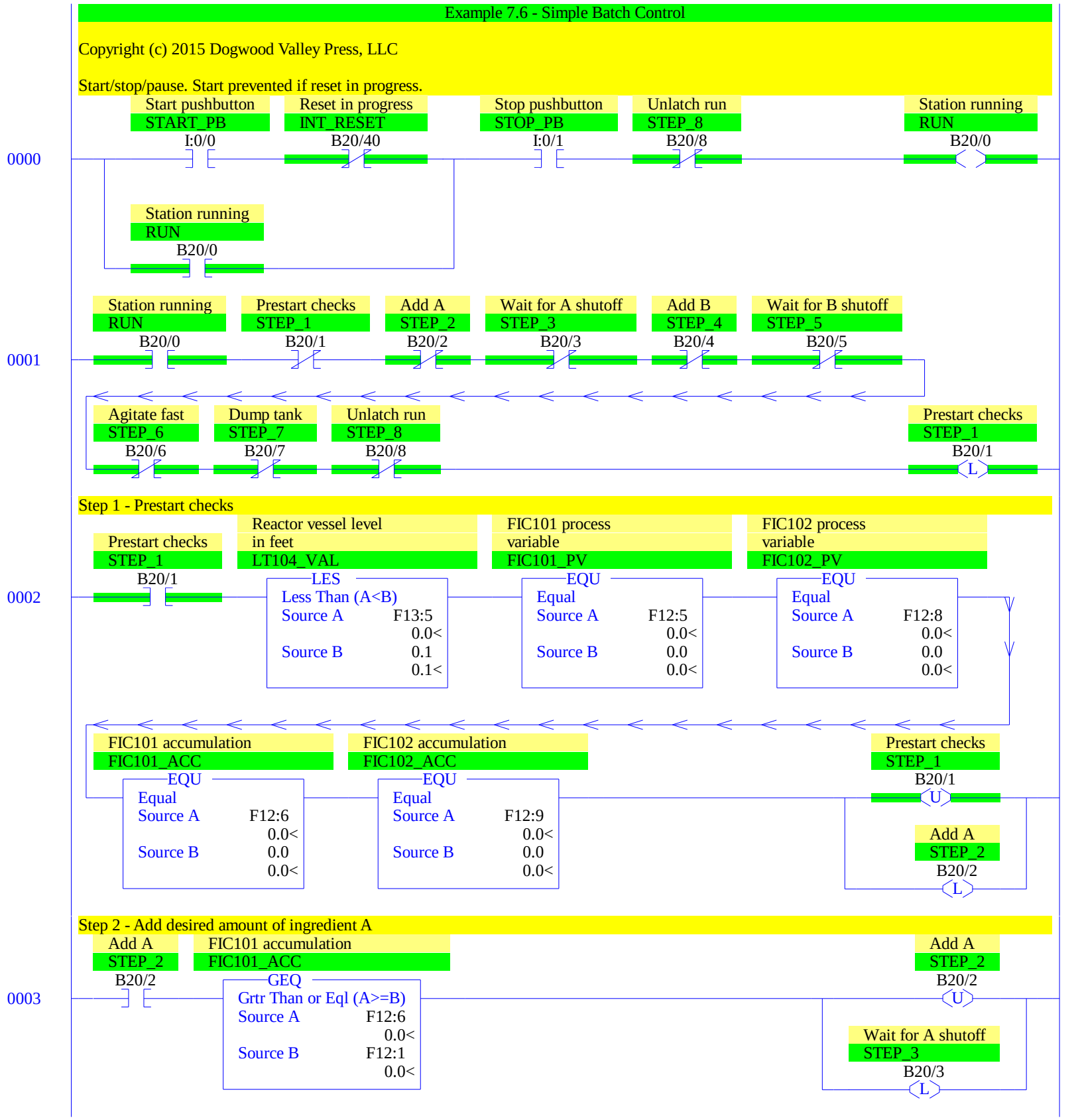
PID Configuration

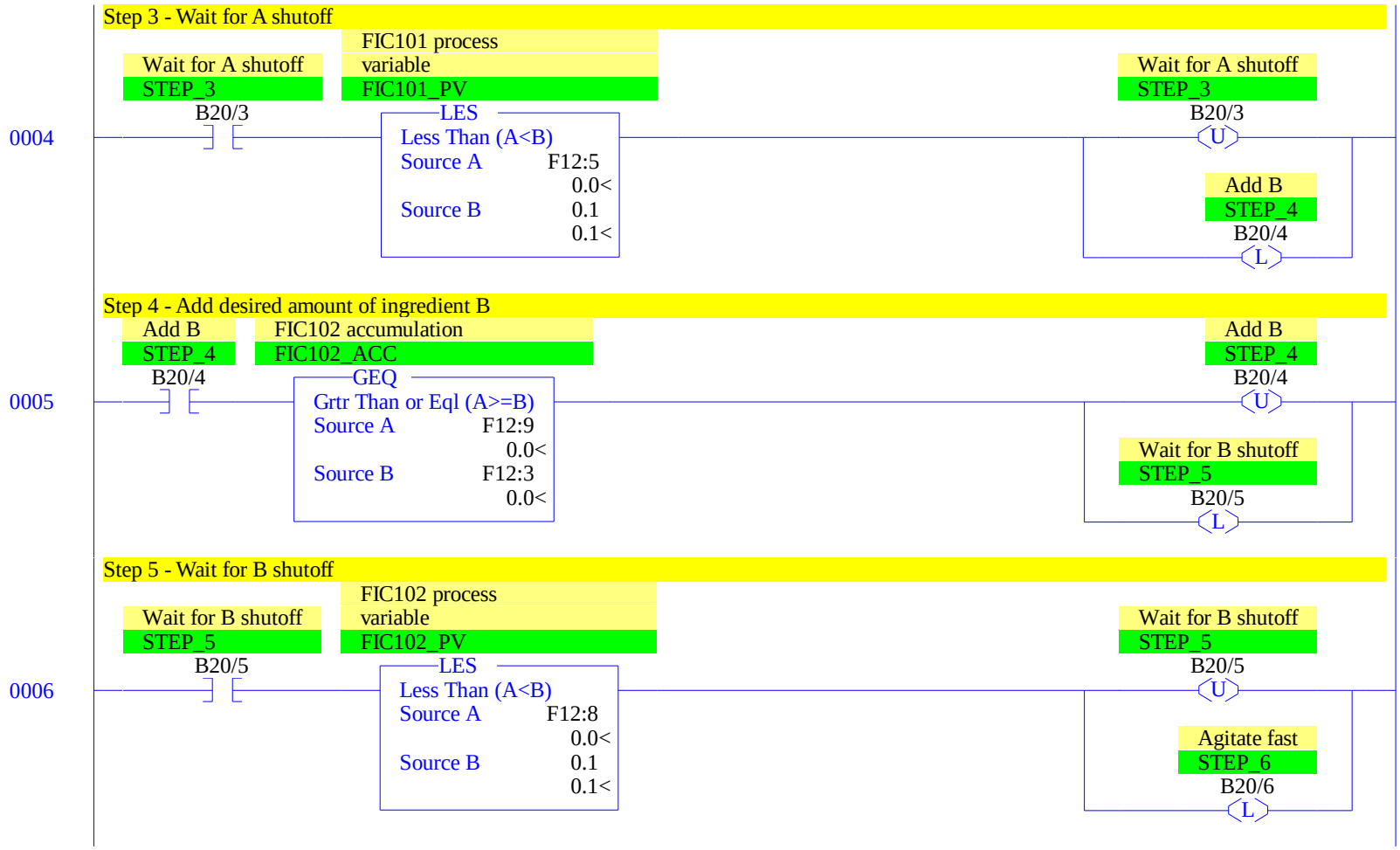
PID - Rung #2:22 - PD15:0

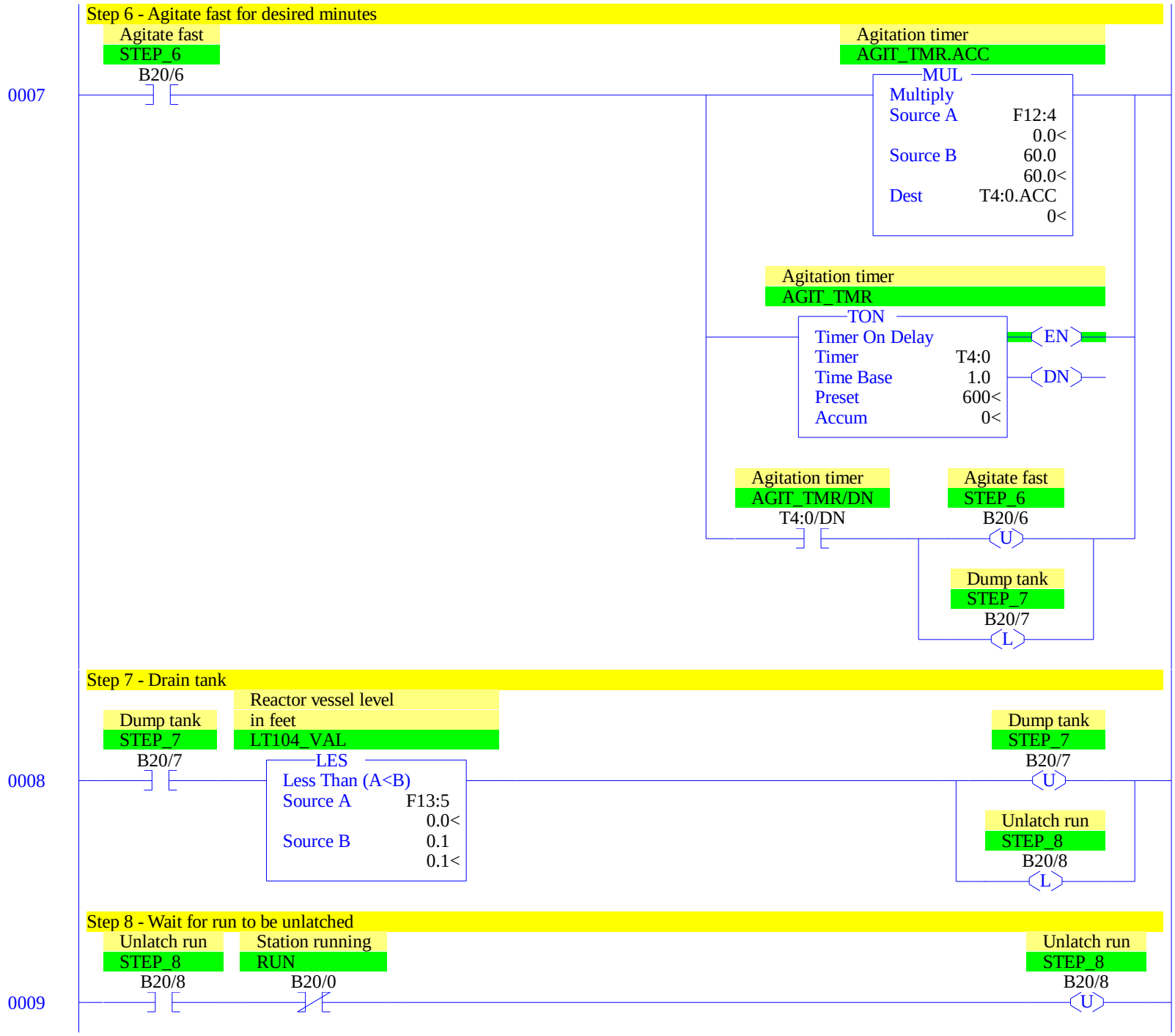
Controller Gain, Kc: 0.4	Setpoint: 40
Reset Term, Ti: 0.10	Setpoint MAX(Smax): 100
Rate Term, Td: 0.00	Setpoint MIN(Smin): 0
Loop Update Time: 0.25	Process Variable PV: 0
Control Mode: E = SP - PV	Control Output CV (%): 0
PID Control: Auto	Output Max CV(%): 100
Time Mode: STI	Output Min CV(%): 0
Limit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







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

0011

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<

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

Add A
STEP_2
B20/2

0012

FIC101 setpoint
FIC101_SP

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

Agitator controls

0020

Add B
STEP_4
B20/4

Wait for B shutoff
STEP_5
B20/5

Dump tank
STEP_7
B20/7

Agitator slow control
A105_SLOW
O:0/0

0021

Agitate fast
STEP_6
B20/6

Agitator fast control
A105_FAST
O:0/1

FIC101 flow loop
Handle SP and PV variables
Run controls the mode

0022

Ingredient A flow control
FIC101

PID
PID
PID File PD15:0
Process Variable I:1.1
Control Variable O:2.0
Setup Screen <

0023

Station running
RUN
B20/0

Ingredient A flow control
FIC101_MD
PD15:0/AM

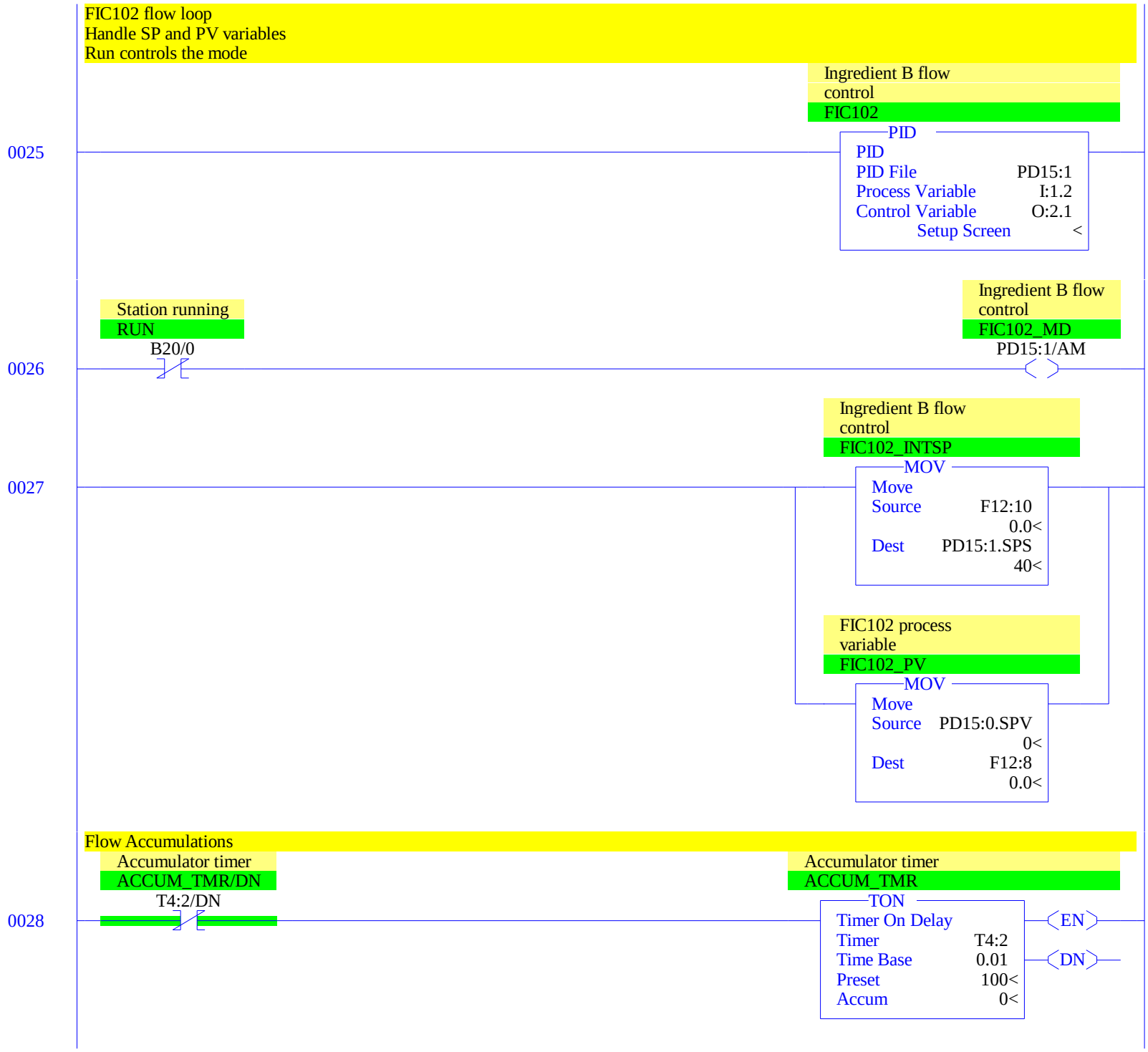
0024

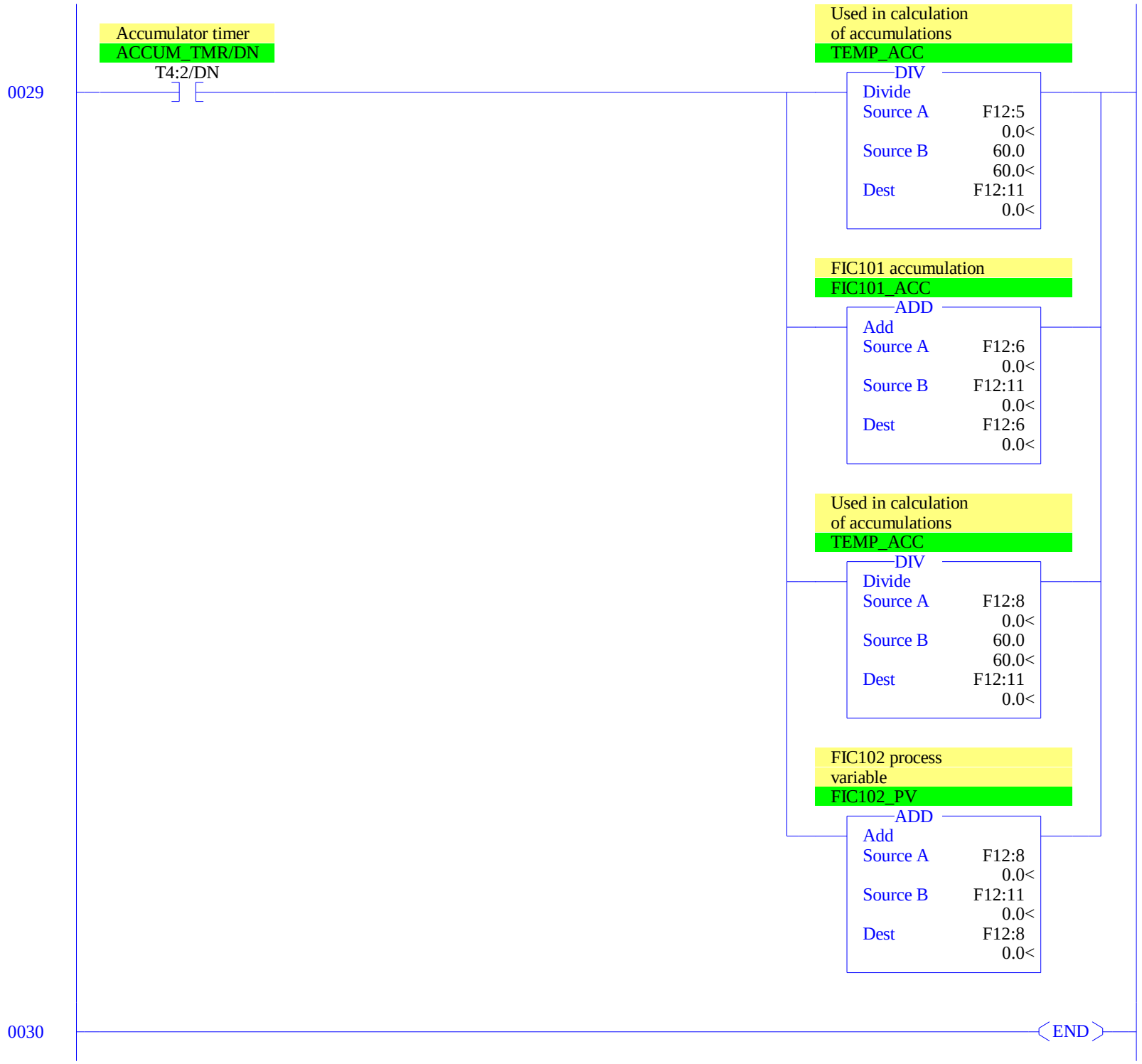
Ingredient A flow control
FIC101_INTSP

MOV
Move
Source F12:7
0.0<
Dest PD15:0.SPS
40<

FIC101 process variable
FIC101_PV

MOV
Move
Source PD15:0.SPV
0<
Dest F12:5
0.0<





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
                DIV - File #2 - 29
                EQU - File #2 - 2
                LES - File #2 - 4
F12:6         - {FIC101_ACC} FIC101 accumulation
                MOV - File #2 - 11
                ADD - File #2 - 29
                EQU - File #2 - 2
                GEQ - File #2 - 3
F12:7         - {FIC101_SP} FIC101 setpoint
                MOV - File #2 - 12, 13, 24
F12:8         - {FIC102_PV} FIC102 process variable
                MOV - File #2 - 27
                ADD - File #2 - 29
                DIV - File #2 - 29
                EQU - File #2 - 2
                LES - File #2 - 6
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
```

```
                ADD - File #2 - 29
                DIV - File #2 - 29
F13:5         - {LT104_VAL} Reactor vessel level in feet
                MUL - File #2 - 10
                LES - File #2 - 2, 8
N14:5         - MUL - File #2 - 10
                SCP - 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
                OTU - File #2 - 7
                XIC - File #2 - 7, 21
                XIO - File #2 - 1
B20/7         - {STEP_7} Dump tank
                OTL - File #2 - 7
                OTU - File #2 - 8
                XIC - File #2 - 8, 18, 19, 20
                XIO - File #2 - 1
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
```