

## Batch Reactor Control

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Additional internal memory:

Symbol	Address	
RUN	B3/0	On while batch running
STEP_1 to STEP_6	B20/1 to B20/6	Step-in-progress bits
FAST_AGIT_TMR	T4:1	Times fast agitation step
DECR_AGIT_TMR	T4:2	Times decreasing agitation step
COUNT_A	C5:1	Measures amount of A being added
COUNT_B	C5:2	Measures amount of B being added
COUNT_OUT	C5:3	Measures amount of product being drained

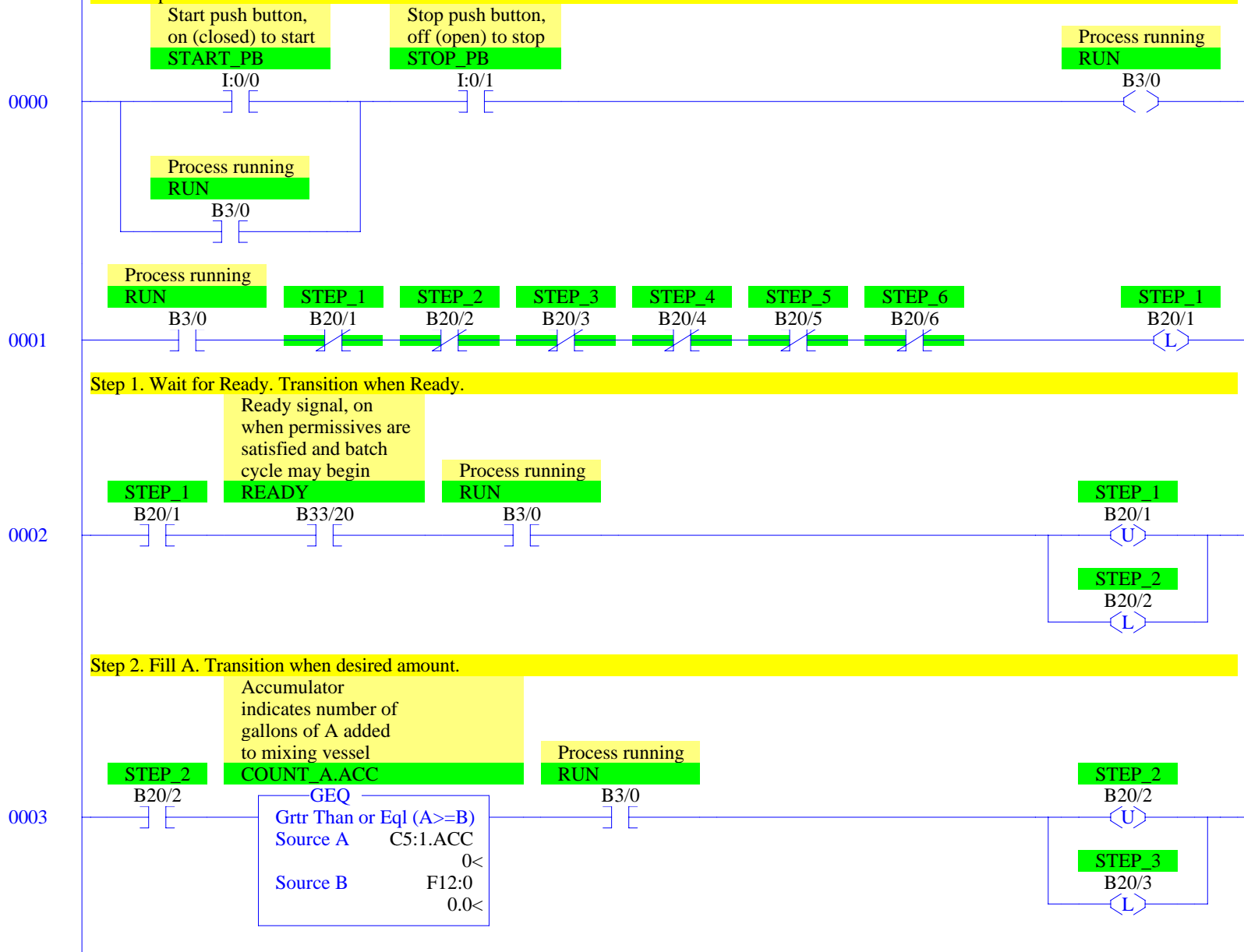
Conversion formulas

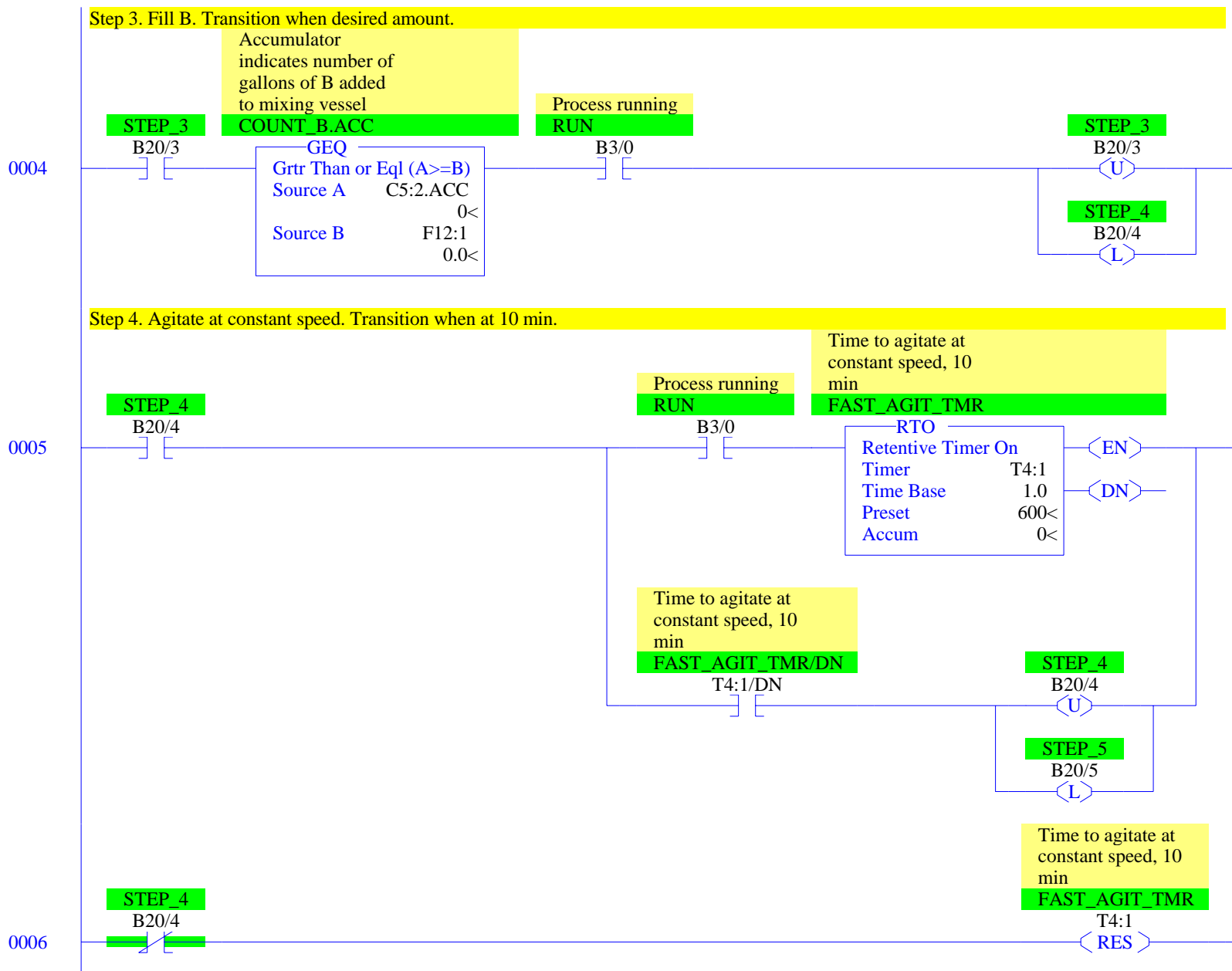
$$\text{AGIT\_AO} = ((\text{AGIT\_RPM} / 1000) * (24966)) + 6241$$

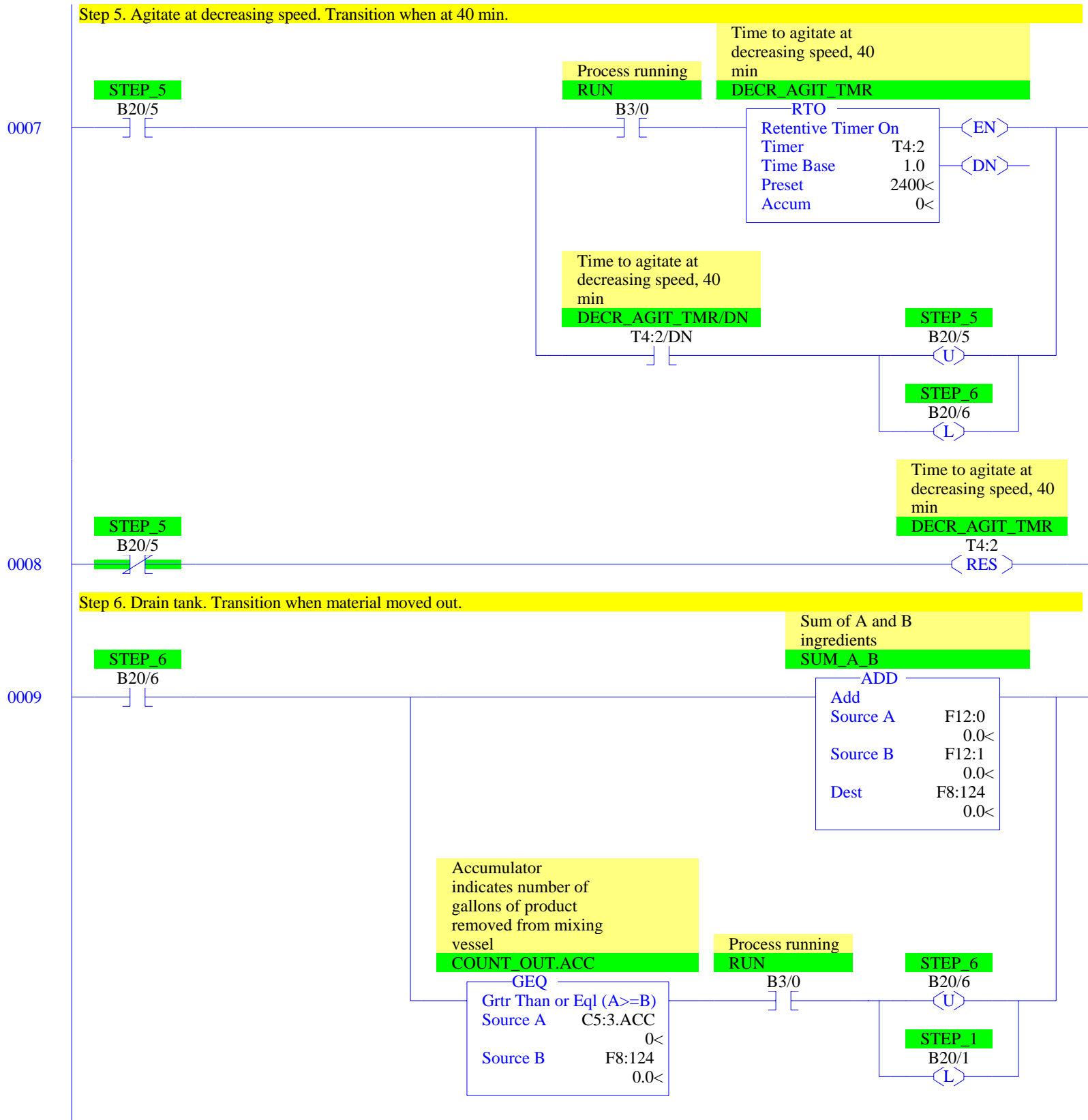
$$\text{AGIT\_CURR} = ((\text{ACUR\_MEAS} - 6241) / 24965) * (20)$$

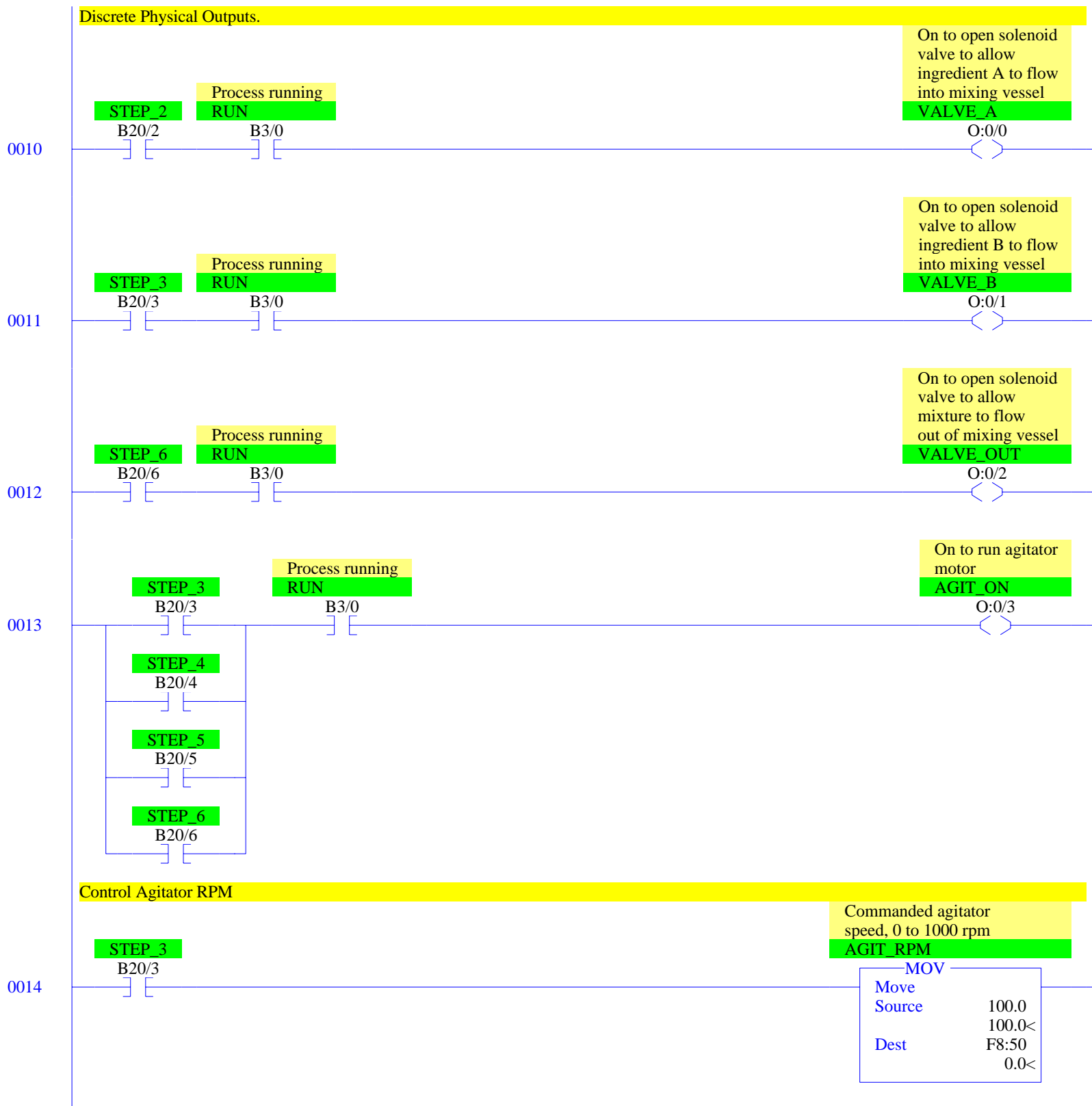
In Step\_5, AGIT\_RPM = 500 - DECR\_AGIT\_TMR.ACC/10

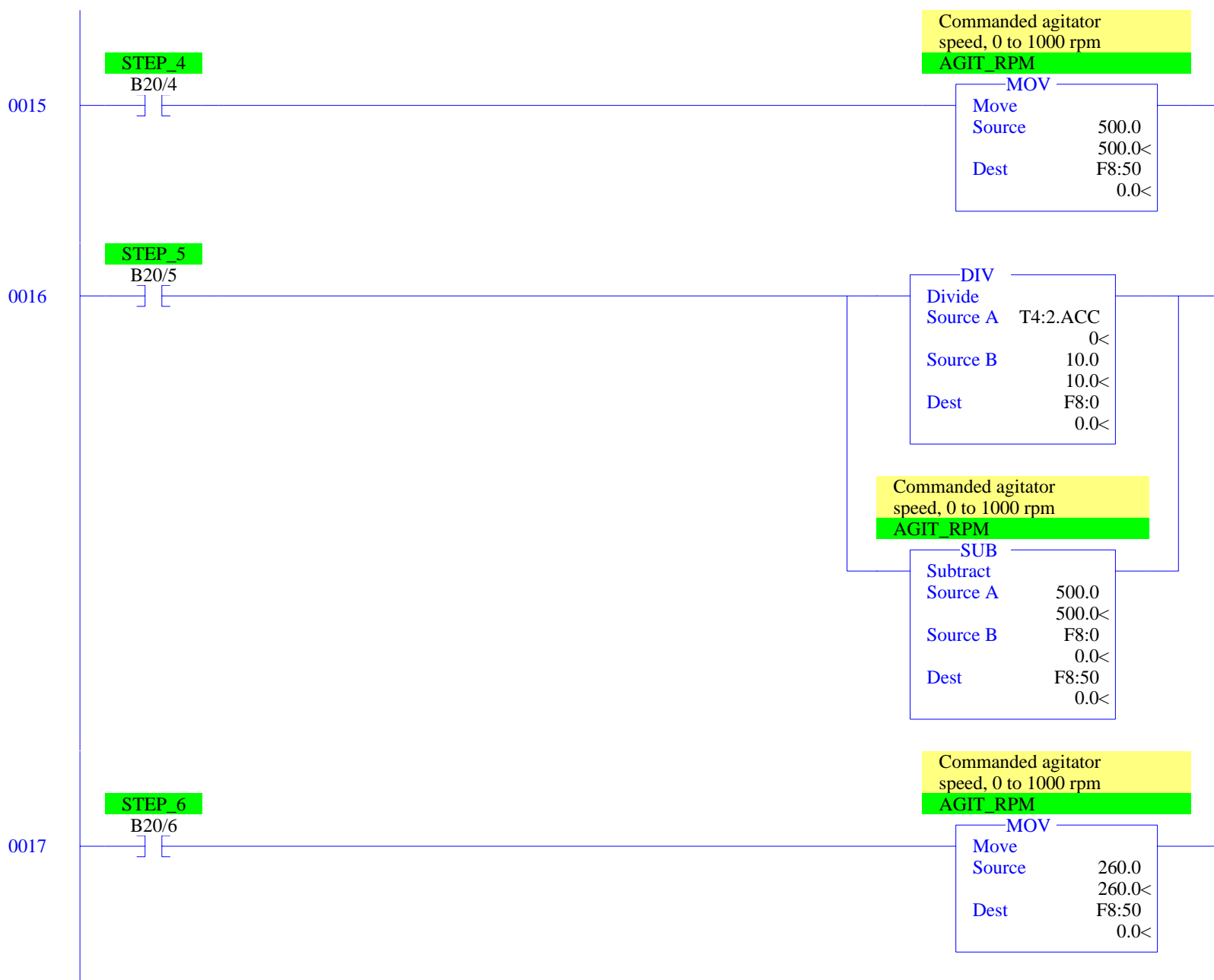
Start/Stop/Pause. Initial start











Calculate agitator speed AO from desired RPM  
1769-OF2 - range is 6241 to 31206

0018

DIV

Divide

Source A	F8:50
	0.0<
Source B	1000.0
	1000.0<
Dest	F8:0
	0.0<

MUL

Multiply

Source A	F8:0
	0.0<
Source B	24965.0
	24965.0<
Dest	F8:0
	0.0<

Agitator motor  
controller speed  
command, represents  
0-1000 rpm

AGIT\_AO

ADD

Add

Source A	F8:0
	0.0<
Source B	6241.0
	6241.0<
Dest	O:2.0
	0<

0019

Calculate agitator current and do alarms.

SUB	
Subtract	
Source A	I:1.0 0<
Source B	6241.0 6241.0<
Dest	F8:0 0.0<

DIV	
Divide	
Source A	F8:0 0.0<
Source B	24965.0 24965.0<
Dest	F8:0 0.0<

Agitator motor  
current, 0 to 20  
amps

AGIT\_CURR

MUL	
Multiply	
Source A	F8:0 0.0<
Source B	20.0 20.0<
Dest	F8:51 0.0<

Agitator motor  
current, 0 to 20  
amps

AGIT\_CURR

On when agitator  
current >= 18 amps

CURR\_ALARM

O:0/5

&lt;&gt;

0020

GEQ

Grtr Than or Eql (A&gt;=B)

Source A F8:51

0.0&lt;

Source B 18.0

18.0&lt;

Agitator motor  
current, 0 to 20  
amps

AGIT\_CURR

On when agitator  
current >= 18 amps

CURR\_ALARM

O:0/5

2/

On when agitator  
current >= 15 amps  
but <18 amps

CURR\_WARN

O:0/4

&lt;&gt;

0021

GEQ

Grtr Than or Eql (A&gt;=B)

Source A F8:51

0.0&lt;

Source B 15.0

15.0&lt;





## RSLogix 500 Cross Reference Report - Sorted by Address

O:0/0	- {VALVE_A} On to open solenoid valve to allow ingredient A to flow into mixing vessel OTE - File #2 - 10
O:0/1	- {VALVE_B} On to open solenoid valve to allow ingredient B to flow into mixing vessel OTE - File #2 - 11
O:0/2	- {VALVE_OUT} On to open solenoid valve to allow mixture to flow out of mixing vessel OTE - File #2 - 12
O:0/3	- {AGIT_ON} On to run agitator motor OTE - File #2 - 13
O:0/4	- {CURR_WARN} On when agitator current >= 15 amps but <18 amps OTE - File #2 - 21
O:0/5	- {CURR_ALARM} On when agitator current >= 18 amps OTE - File #2 - 20 XIO - File #2 - 21
O:2.0	- {AGIT_AO} Agitator motor controller speed command, represents 0-1000 rpm ADD - File #2 - 18
I:0/0	- {START_PB} Start push button, on (closed) to start XIC - File #2 - 0
I:0/1	- {STOP_PB} Stop push button, off (open) to stop XIC - File #2 - 0
I:0/2	- {PULSE_A} Each pulse indicates that 1 gal of A has flowed past flow meter XIC - File #2 - 22
I:0/3	- {PULSE_B} Each pulse indicates that 1 gal of B has flowed past flow meter XIC - File #2 - 23
I:0/4	- {PULSE_OUT} Each pulse indicates that 1 gal of outlet material has flowed past flow meter XIC - File #2 - 24
I:1.0	- {ACUR_MEAS} Raw agitator current measurement, represents 0-20 amps SUB - File #2 - 19
B3/0	- {RUN} Process running OTE - File #2 - 0 XIC - File #2 - 0, 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13
T4:1	- {FAST_AGIT_TMR} Time to agitate at constant speed, 10 min RTO - File #2 - 5 RES - File #2 - 6
T4:1/DN	- XIC - File #2 - 5
T4:2	- {DECR_AGIT_TMR} Time to agitate at decreasing speed, 40 min RTO - File #2 - 7 RES - File #2 - 8
T4:2/DN	- XIC - File #2 - 7
T4:2.ACC	- DIV - File #2 - 16
C5:1	- {COUNT_A} Accumulator indicates number of gallons of A added to mixing vessel CTU - File #2 - 22 RES - File #2 - 25
C5:1.ACC	- GEQ - File #2 - 3
C5:2	- {COUNT_B} Accumulator indicates number of gallons of B added to mixing vessel CTU - File #2 - 23 RES - File #2 - 25
C5:2.ACC	- GEQ - File #2 - 4
C5:3	- {COUNT_OUT} Accumulator indicates number of gallons of product removed from mixing vessel CTU - File #2 - 24 RES - File #2 - 25
C5:3.ACC	- GEQ - File #2 - 9
F8:0	- ADD - File #2 - 18 SUB - File #2 - 16, 19 MUL - File #2 - 18, 19 DIV - File #2 - 16, 18, 19
F8:50	- {AGIT_RPM} Commanded agitator speed, 0 to 1000 rpm MOV - File #2 - 14, 15, 17 SUB - File #2 - 16 DIV - File #2 - 18
F8:51	- {AGIT_CURR} Agitator motor current, 0 to 20 amps MUL - File #2 - 19 GEQ - File #2 - 20, 21
F8:124	- {SUM_A_B} Sum of A and B ingredients ADD - File #2 - 9 GEQ - File #2 - 9
F12:0	- {DES_A} Desired amount of A to add, in gal

## RSLogix 500 Cross Reference Report - Sorted by Address

	ADD - File #2 - 9
	GEQ - File #2 - 3
F12:1	- {DES_B} Desired amount of B to add, in gal
	ADD - File #2 - 9
	GEQ - File #2 - 4
B20/1	- {STEP_1}
	OTL - File #2 - 1, 9
	OTU - File #2 - 2
	XIC - File #2 - 2, 25
	XIO - File #2 - 1
B20/2	- {STEP_2}
	OTL - File #2 - 2
	OTU - File #2 - 3
	XIC - File #2 - 3, 10
	XIO - File #2 - 1
B20/3	- {STEP_3}
	OTL - File #2 - 3
	OTU - File #2 - 4
	XIC - File #2 - 4, 11, 13, 14
	XIO - File #2 - 1
B20/4	- {STEP_4}
	OTL - File #2 - 4
	OTU - File #2 - 5
	XIC - File #2 - 5, 13, 15
	XIO - File #2 - 1, 6
B20/5	- {STEP_5}
	OTL - File #2 - 5
	OTU - File #2 - 7
	XIC - File #2 - 7, 13, 16
	XIO - File #2 - 1, 8
B20/6	- {STEP_6}
	OTL - File #2 - 7
	OTU - File #2 - 9
	XIC - File #2 - 9, 12, 13, 17
	XIO - File #2 - 1
B33/20	- {READY} Ready signal, on when permissives are satisfied and batch cycle may begin
	XIC - File #2 - 2