

Mixing plant

Task definition

The MFD-Titan is required to control a mixing plant consisting of a mixing tank and a stirrer for mixing two components. The display is required to show machine status information and it should also be possible to modify the recipe (proportion of the two components) via the display. Recipe entry is password protected.

You can run the plant in Automatic or Manual mode. In Manual mode you operate the plant by means of switches. In this mode, the plant therefore has no logic functions . apart from the EMERGENCY-STOP interlock.

In Automatic mode, the stirring process is controlled automatically. You enter the required mixing ratio for the two components as a percentage in a password-protected menu. The MFD then calculates a filling level for the first component. The entry does not have to be repeated every time since the basic ratio is stored in a data function block.

The automatic sequence starts after a delay of 10 seconds if:

the mixing tank (tank 3) is empty,
the controller is switched on,
the EMERGENCY-STOP has not been released and
the mode switch is set to AUTO.

Component 1 is then filled to the calculated level. Once the level has been reached, a stirrer operation runs for 5 seconds. After a wait time of 10 seconds, component 2 is added until the mixing tank is full. The mixture is then stirred for 20 seconds and then emptied during stirring. This is continued until the level is below the level of component 1. Once the mixing tank is empty again, the AUTO sequence is restarted.

If the EMERGENCY-STOP is actuated in automatic mode, all valves are closed and the stirrer is switched off. After the EMERGENCY-STOP is reset, the automatic mode resumes the sequence at the point of interruption.

Device class used

MFD-Titan

Wiring

Inputs

I01 Main switch
I02 MANUAL/AUTO selector switch
I03 Open valve Tank 1 actuator
I04 Open valve Tank 2 actuator
I05 Open valve Tank 3 actuator
I06 Stirrer Mixing tank ON actuator
I07 Mixing tank level sensor
I09 EMERGENCY-STOP scan

Outputs

Q01 Valve Tank 1 contactor
Q02 Valve Tank 2 contactor
Q03 Valve Tank 3 contactor
Q04 Stirrer Mixing tank contactor
LE2 MFD-Titan Display EMERGENCY-STOP tripped LED
LE3 MFD-Titan Display AUTO mode active LED

Parameters

A01 Tank empty
A02 Level 1 reached
A03 Level 2 reached
DB1 Basic setting of mixing ratio
DB2 Reset the step markers
LS1 Percentage of full level - scaling
OT1 Operating hours counter, system
OT2 Operating hours counter, stirrer
T01 Time delay, open Y1
T02 On duration 1, stirrer
T03 Pause duration after 1st startup
T04 On duration 2, stirrer
T05 Pause duration after 2nd startup
T06 Animation changeover pulse