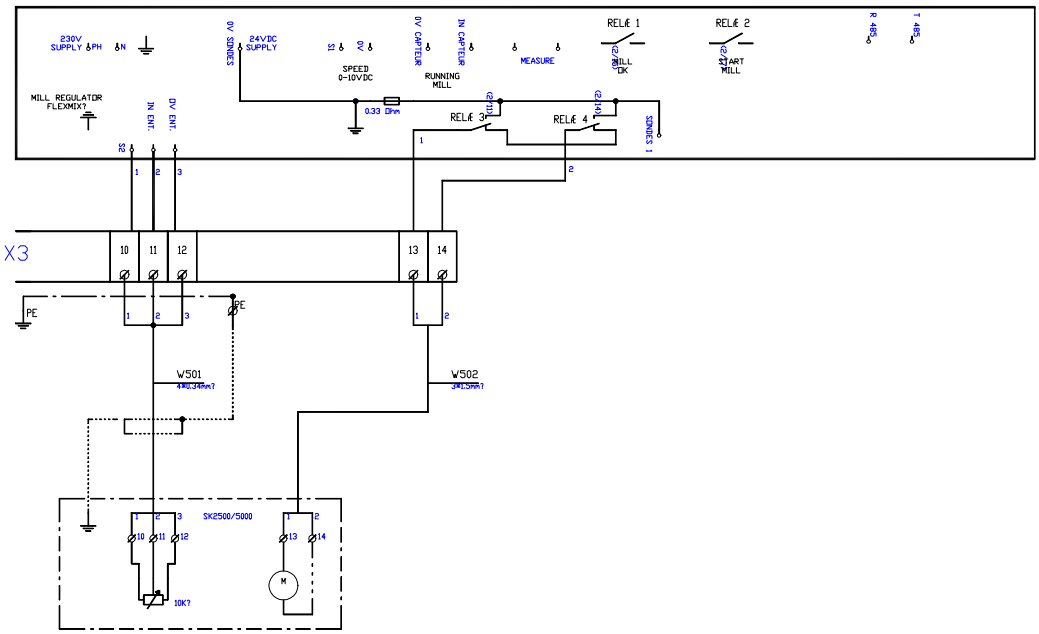
5.7.0 Connection of the Electronic Mill Controller Type ”FlexMix”

Numerical mill regulation in the cabinet can be placed externally close to the mill or internally in the control panel for the plant.
The diagram below shows the connection for the mill regulation placed internally in the control panel.

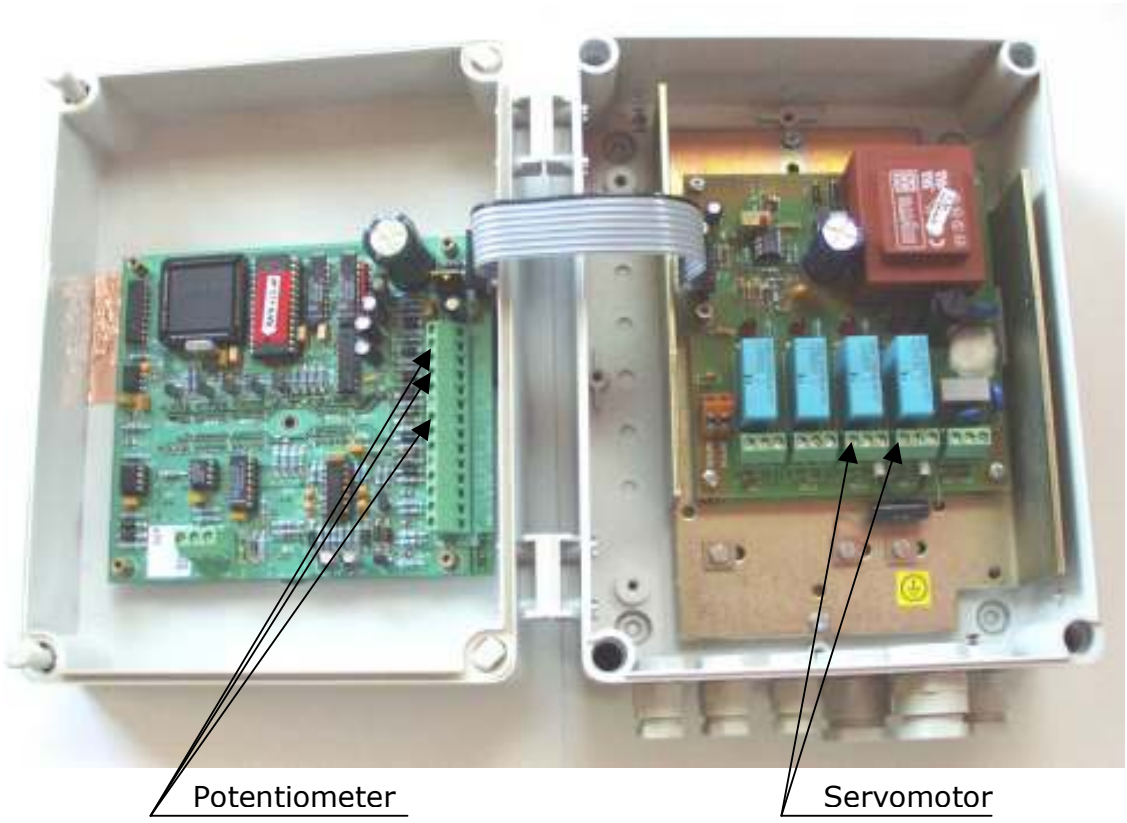
Fig.10, Connection diagram for mill controller type ”FlexMix”



Note: Placement of the clamps to connection of the servomotor and position potentiometer of the mill, fig. 6.

Fig. 11 shows the locality of the clamps, when NMR is placed outside the control panel and is connected directly to the mill.

Fig.11, Connection of controller



5.7.1 Running-In Procedure for Controller Type ”FlexMix”

The controller has to be programmed and adjusted to the actual job, before the plant is started.

Fig.12, Controller

There are two set data for respectively user and configuration in controller. Normally the controller is in the user-menu, as the configuration is blocked by a code.

The field ”CODE” describes, which data or which function there is shown in the field ”VALEUR”.

You shift between the different data and functions with the keys ”+” and ”-”.
To change the value in a chosen function press brief the key ”P”, and the value in the display ”VALEUR” begins to blink.
Now the value can be changed with the keys ”+” and ”-”.
When the wanted value is adjusted, the ”P”-key is pressed again, until the display stops the blinking as indication of the new value is registered.

5.7.2 User Data

The below is for the controller ”mode” 4, for the disc mill with automatic regulation.
The other ”modes” of the controller are described in the erection manual FlexMix.

CODE 0: Shows the actual ampere load (0-400 amp.) of the mill. The value is a read-out value and cannot be changed via the keyboard. The shift is automatically done, if the keys of the controller have not been activated for some time.
CODE 1: Speed for frequency controlled auger (0-100).
CODE 2: Set point for the disc distance in the mill (0-15 mm).
CODE C: Access code to the configuration menu (38).

5.7.3 Configuration Data

Note! It is not allowed to make changes in the data in the configuration, while an automatic process is running in the plant.

Note! If no keys are pressed for 4 minutes, the controller turn automatically back to user data.
Or press ”+” and ”-” at the same time to turn back.

- CODE 0: Choice of regulation method (mode)

0	No regulation
1	Weight dependent regulation of supply to the mill with motorized valve
2	Weight dependent regulation of supply to the mill with frequency controlled auger in combination with automatic distance regulation of the disc mill
3	Weight dependent regulation of supply to the mil with frequency controlled auger
4	Automatic distance regulation of the disc mill

- CODE 1: Adjustment of the instrument transformer for mill ampere.

Transf.	Display
25/5	025
50/5	050
100/5	100
150/5	150
200/5	200
300/5	300
400/5	400

- CODE 2: FlexMix address for controller (1-3)
- CODE 3: Simulation of analogue output S1 (0-10 Vdc)
- CODE 4: Simulation of function for relay 1 (OFF/ON)
- CODE 5: Simulation of function for relay 2 (OFF/ON)
- CODE 6: Simulation of function for relay 3 (OFF/ON)
- CODE 7: Simulation of function for relay 4 (OFF/ON)
- CODE 8: Simulation of analogue output S2 (0-10 Vdc)
- CODE 9: Read-out of signal on analogue input (0-10 Vdc)
- CODE A: Re-set controller and put in plant adjustment (press value 255)

Adjustment of "user data" from the factory

CODE	Adjust.
1	20
2	10
3	30
4	2
5	5
6	5
7	10
8	130
9	10
A	10
B	5

- Adjustment of ”configuration data” from the factory

CODE	Adjust.
0	0
1	25
2	1
E	5

- CODE B: Press a number different from 38 to turn back to the user menu (or press ”-” and ”+” at the same time).
- CODE C: (Only mode 2 and 4) Read-out of the power consumption in the servomotor for adjustment of distance in the disc mill with a scale from 0-255. To get real consumption in ampere, the value is multiplied by 0,015.
- CODE D: (Only mode 2 and 4) Manual controller of the servomotor for adjustment of distance in the disc mill.
  ”SIN” = stop in neutral position.
  ”INC” = (increase) increase the distance.
  ”DEC” = (decrease) decrease the distance.
  The controller watches the power consumption in the servomotor and goes automatically back to ”SIN”, when the adjustment mechanism reaches the outer positions.
- CODE E: (Only mode 2 and 4) Scale reading by maximal distance between the discs.

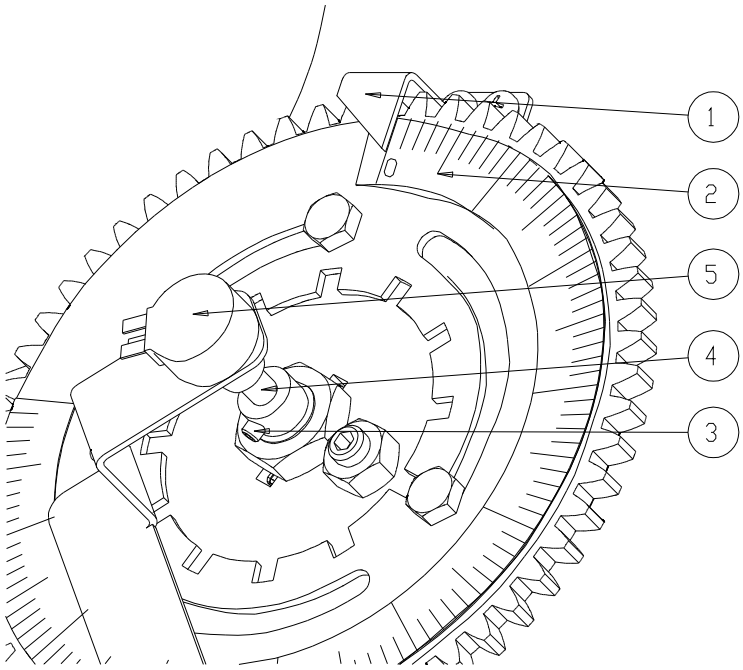
5.7.4 Relay Functions

- Relay 1: Alarm indication (relay stops by alarm).
- Relay 2: Mode 2+4 = start mill, mode 3 = grinding end.
- Relay 3-4: Signal to the servomotor for distance adjustment of the disc mill.

5.7.5 Running-In Procedure for Disc Mill

Note! Before the running-in procedure starts, the shaft of the mill is loosened, fig. 13, pos. 4, by pointed screw, pos. 3.
For access to the shaft, the screen over the servomotor is dismounted fig. 6, pos. 1.
No automatic process must be running, while the controller is adjusted.

Fig.13, Potentiometer and scale



1. Choose user code ”C” at the controller and press the access code to configuration (38).
2. Wait a minute, while the soft ware version shows at the display.
3. Choose configuration code ”0”, and until the controller shows mode ”4” (the other ”modes” are described in the erection manual FlexMix).
4. Choose configuration code ”1” and until the size at instrument transformer for the mill main motor (is important for correct read-out of the ampere consumption of the controller and in the FlexMix display (look at transformer data in the electrician documentation or read directly at the instrument transformer)).
5. Choose configuration code ”D” and activate the distance regulation for obtaining of minimum distance (”DEC”).
6. Check up that the distance is decreased.

7. If the distance regulation reacts opposite, the two wires to the servomotor are swapped (clamp 13 and 14 in the mill connection box), and the running-in procedure is repeated from step 4.
8. By minimum distance the scale of the mill is adjusted to 0,0 mm, fig. 13 pos. 1 and 2.
9. Choose configuration code ”9” and turn the shaft of potentiometer, fig. 13 pos. 4, until a signal is read-out at ca. 7,0 Vdc.
10. Fasten the shaft in the position by the pointed screw, fig. 13 pos. 3.
11. Choose configuration code ”D” and activate the distance regulation for obtaining maximum distance (”INC”).
12. Choose configuration code ”9” and check that the signal from the potentiometer decreases, when the distance increases.
13. If signal from the potentiometer react opposite, the two outer wires in the potentiometer are swapped (clamps 10 and 12 in the mill connection box), potentiometer shaft, fig. 13 pos. 4, the pointed screw is loosened, fig. 13 pos. 3., and the running-in procedure is repeated from step 4.
14. Choose configuration code ”D” and activate distance regulation for obtaining minimum distance (”DEC”).
15. Choose configuration code ”D” and activate distance regulation for obtaining maximum distance (”INC”).
16. Press the actual scale value by maximum distance in the configuration code ”E”.

The running-in procedure is now brought to the end, and it is checked that the result is satisfactory by going back to the user menu by pressing ”-” and ”+” at the same time.
Now start up the mill manually via the service panel or FlexMix simulation menu.
Wait for the mill automatically adjusts the disc distance to maximum before the main motor is started.
After 5 seconds the automatically distance adjustment begins to find the wanted position.
The position of the mill scale has to correspond to the value in the controller user menu code ”2”.
If the wanted adjustment not has been reached within 30 seconds, the alarm ”DEF 2” is shown in the display (the alarm is deleted by re-starting the mill).
Try to change the value in the user code ”2” (while the mill runs) and check by scale that the distance regulation is at the same value (+/- 0,1 mm).
This control can also be done via FlexMix simulation menu, but in both cases the mill has to be started manually, and no automatic process must be running in the plant at the same time.