Softstarter

Changing of Thyristors and Bypass Relay/Contactor PSE18…370

1SFC132064M0201 Mars-11

PSE18…370

Contents

1. ESD Warning

Please note!

The life span of electronics can be affected by damage caused by electrostatic discharge. This can happen if a charged tool or person touches a component. Therefore it is very important that all tools and personnel are discharged by touching an earthed point before the printed circuit board or any of the components are touched. It is equally important to discharge the package with the new component before opening it.

A person walking on a carpet can be charged with up to fifteen thousand volt (15000V). Compare this with the fact that some sensitive components can be destroyed when discharged on a much lower level (about 100V). We kindly ask you to pay notice to this, as this is a vital point in order to ensure the life span of the product.

2. Tools

Small screwdriver for removing the cover.
Torx screwdriver Tx20
Torx screwdriver Tx25
Torx screwdriver Tx30
Torx screwdriver Tx40
Allen key 4mm
Allen key 8mm

3. Step by step

1. **Before disconnecting the cables - mark them.**

2. **All screws with built-in conical spring washers and single conical spring washers which are removed shall be exchanged to new unused ones.**

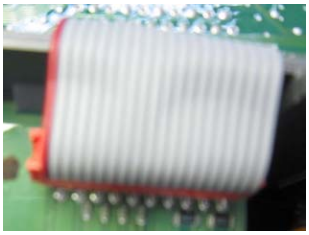
3. Disconnect all cables from the terminals 1 through 14, external keypad and the fieldbus plug accessory.

4. Disconnect the cables from 1L1, 3L2, 5L3, 2T1, 4T2, 6T3. For PSE18…105 remove the connection unit.

5. Detach the HMI module with a small screwdriver.

6. **Discharge the tools and yourself by touching earth (if you are not earthed).**

7. Disconnect the gate cables from the main-board.



8. Disconnect the ribbon cable from the sub-board.

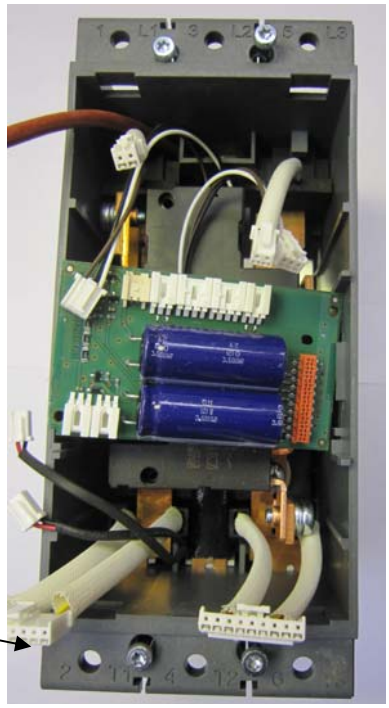
9. For PSE210…370 disconnect the other cables between the main-board and the sub-board.

10. Remove the HMI module.

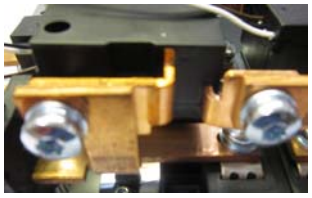
11. Disconnect all the cables from the sub-board.

12. Remove the sub-board from the middle part.

13. Remove the middle part (4-6 screws).



PSE18…105



Change of bypass relay / contactor.

PSE18…170

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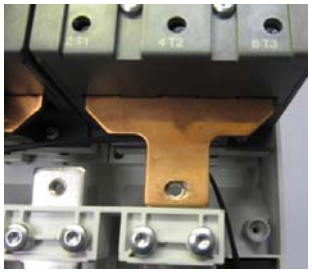
14. Remove the screws which hold the relay.

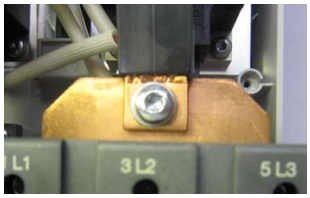
15. If only the relay is broken, mount the new relay and go to step 38 to reassemble the unit.

16. If the thyristor is broken go to step 24.

PSE210…370

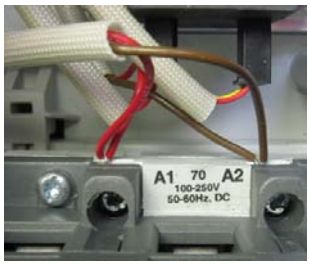


17. If the by-pass contactor is broken, remove the flexi bars which are connected to the copper bars on the broken contactor.



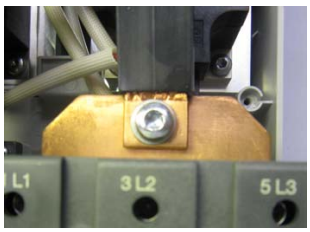
18. Remove the copper bar from the contactor.

19. Remove the cables from the coil terminals A1 and A2 and remove the contactor.

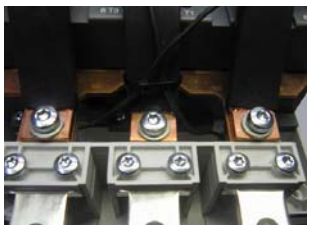


20. Mount the copper bar to the new contactor. It shall be mounted in the upper connection. Use the torque specified in **Table 1.**

21. Put the new contactor in place and mount the cables to the coil terminals A1 and A2.



22. Mount the copper bars on the contactor and then mount the flexi bars. Use the torque specified in **Table 1.**

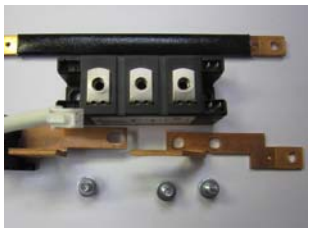


23. If the thyristor is broken, go to step 31 otherwise go to step 38.

Change of thyristors

PSE18…170

24. Disconnect the copper bars from the broken thyristor then remove the thyristor.



25. Clean the contact surfaces on the heat sink and the tyristor module with ethanol. Use lint-free cloth (paper or linen cloth).

26. A very thin layer of heat transfer compound shall be put on the contact surfaces of the thyristor module with a lint-free cloth. Too much compound between the module and the heat sink will give bad thermal conduction and cause risk of overheating the thyristor.

27. Mount the new thyristor. Use the torque specified in **Table 1.**

28. Mount the gate connectors on the thyristor according to **“5. Connection of gate cable”.**

29. Mount the bars on the thyristor and the bypass relays. Use the torque specified in **Table 1.**

30. Go to step 38.

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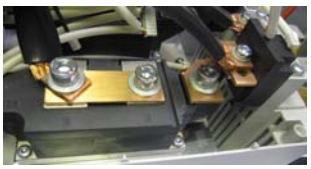


31. Disconnect the copper bars and the flexi bars from the thyristor.

32. Remove the broken thyristor.

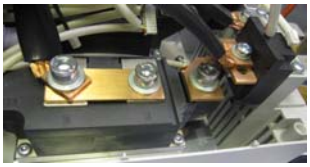
33. Clean the contact surface on the heat sink and the thyristor module with ethanol.
Use lint-free cloth (paper or linen cloth).

34. A very thin layer of heat transfer compound shall be put on the contact surfaces of the thyristor module with a lint-free cloth.
Too much compound between the module and the heat sink will give bad thermal conduction and cause risk of overheating the thyristors.

35. Mount the new thyristor. Use the torque specified in **Table 1.**

36. Mount the gate connectors on the thyristors according to **“5. Connection of gate cable”.**

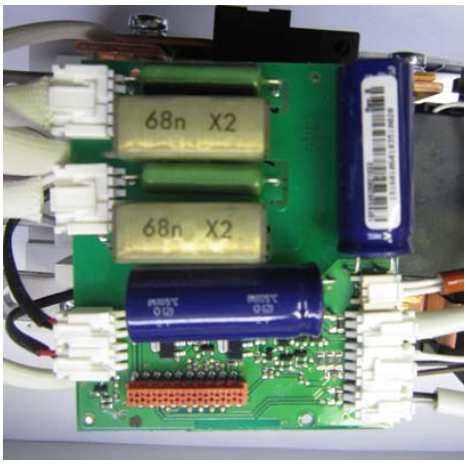
37. Mount the bars and flexi bars on the thyristor.



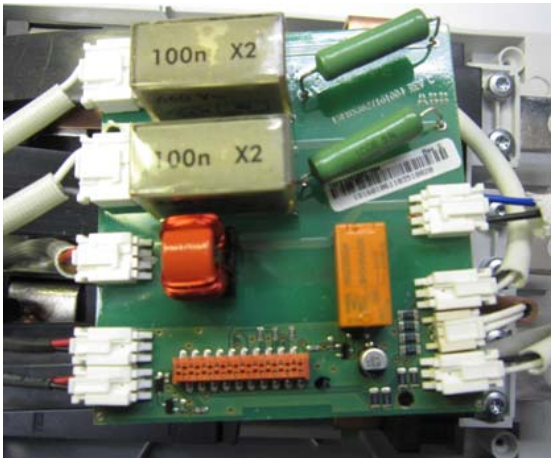
38. Mount the cables on the sub-board according to the fig below. It is very important that each cable is correctly mounted to the correct terminal.

PSE18…105

PSE142…170

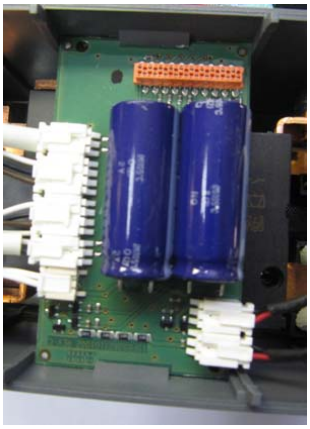


PSE210…370

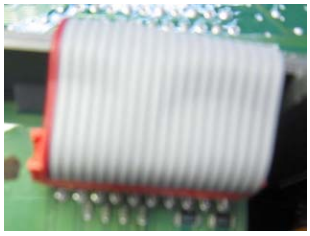


39. Mount the middle part (4-6 screws).

40. Mount the sub-board into the middle part.



41. Connect the ribbon cable on the sub-boards.



42. Connect the gate cables to the main-boards.

43. For PSE210…370 connect the cable between the main board and the sub board.

44. Mount the HMI module.

45. For PSE18…105 mount the connection unit.

46. Connect the cables to 1L1, 3L2, 5L3 (main voltage) and 2T1, 4T2, 6T3 (motor connection).

47. Connect all the cables to the terminals 1 through 14, external keypad and the fieldbus plug accessory.

Ready for start!!

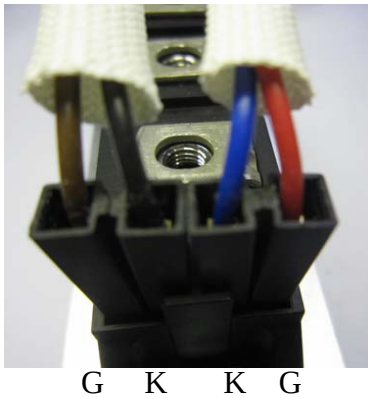
4. Table 1

Softstarter	Thyristor Mounting		Terminal connection		Bypass Terminal connection		Flexi bar and copper bar connection	
	Torque	Screw driver	Torque	Screw driver	Torque	Screw driver	Torque	Screw driver
PSE18…72	3Nm	Tx25	3Nm	Tx25	5Nm	Tx30	-	-
PSE85…105	3Nm	Tx25	5Nm	Tx30	5Nm	Tx30	-	-
PSE142…170	3Nm	Tx25	5Nm	Tx30	8Nm	Tx30	7Nm	Tx30
PSE210	3Nm	Tx25	8Nm	Tx40	8Nm	Allen key 4 mm	7Nm	Tx30
PSE250…370	3Nm	Tx25	12Nm	Allen key 8 mm	8Nm	Allen key 4 mm	7Nm	Tx30

5. Connection of gate cable

PSE18…72

IXYS

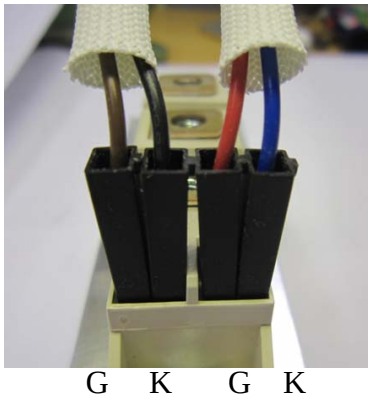


G K K G

Brown Black Blue Red

PSE18…72

Semikron

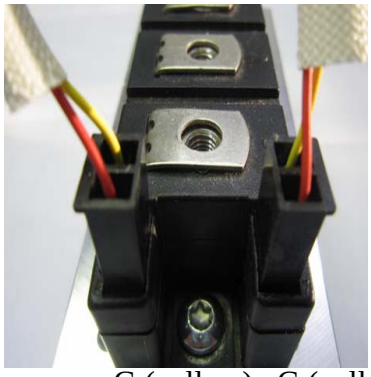


G K G K

Brown Black Red Blue

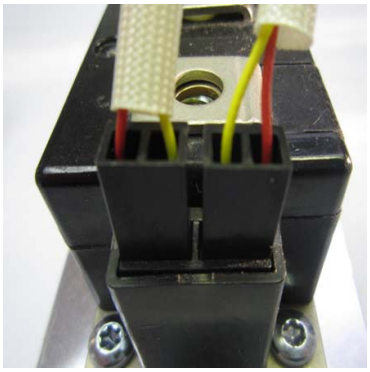
PSE85…170

All manufactures



G (yellow) G (yellow)
K (red) K(red)

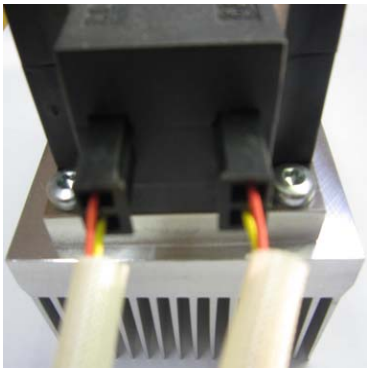
PSE210



K G G K

Red Yellow Yellow Red

PSE250…370



G (yellow) G (yellow)
K (red) K(red)

All gate cables are coded for PSE85…370.

6. Screws with built-in conical spring washers and single conical spring washers.

To be exchanged when changing one broken thyristor.

Pieces to change

Softstarters	M5x10 T25	M6x12 T30	M8x16 T40	6,4x14	13x29
PSE18…72	3	4	-	-	-
PSE85…105	-	7	-	-	-
PSE142…170	-	3	-	6	-
PSE210	-	-	3	2	-
PSE250…370	-	-	-	2	3

To be exchanged when changing broken bypass relay / contactor.

Pieces to change

Softstarters	M5x10 T25	M6x12 T30	M8x16 T40	6,4x14	13x29
PSE18…72	-	2	-	-	-
PSE85…105	-	2	-	-	-
PSE142…170	-	-	-	4	-
PSE210	-	-	-	2	-
PSE250…370	-	-	-	2	-

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