

PROCEDURE FOR EVALUATION OF THE INTEGRITY OF THE FIXED PARTS

Introduction

The procedure described below must be used to assess the absence of damage and the correct operation of the fixed parts before ordering the following kits, for which replacement of the sole moving part is required:

OTOMAX	EMAX	CRADLE IN CRADLE
NOVOMAX G30	EMAX X1	DIRECT REPLACEMENT
NOVOMAX G30	EMAX 2 E1.2	DIRECT REPLACEMENT
NOVOMAX G2-LG	EMAX E2	DIRECT REPLACEMENT
NOVOMAX G2-G4	EMAX 2 E2.2 – E4.2	DIRECT REPLACEMENT
NOVOMAX G5	EMAX 2 E4.2	CRADLE IN CRADLE
MEGAMAX	EMAX	DIRECT REPLACEMENT OPEN DOOR
MEGAMAX F1-F2-F4	EMAX 2 E2.2 – E4.2	DIRECT REPLACEMENT OPEN DOOR/CLOSED DOOR
MEGAMAX F5	EMAX 2 E4.2	CRADLE IN CRADLE
EMAX	NEW EMAX	DIRECT REPLACEMENT
EMAX – NEW EMAX	EMAX 2	DIRECT REPLACEMENT
MASTERPACT M08÷M25	EMAX 2 E2.2	DIRECT REPLACEMENT

The kits described above can only operate correctly if the fixed part in which they are installed is in a good condition. Strictly perform the following inspections in order to assess the condition of the fixed parts.

IMPORTANT WARNING

Before taking any action to service this equipment it is compulsory to:

- open the circuit breaker and make sure that the control springs are not loaded;
- in the event of a withdrawable circuit breaker, take action with the circuit breaker withdrawn from the fixed part;
- when taking action on circuit breakers with a fixed design, or on the fixed parts of a withdrawable breaker, disconnect the supply to the power circuit and to the auxiliary circuits, and earth the terminals in a clearly visible manner, both on the power side and on the load side;
- make the equipment safe in accordance with current laws and standards.

These servicing procedures shall be handled only by qualified personnel with a thorough understanding of the equipment.


This procedure does not include instructions on safety or on maintenance and repair operations.

It is important to note that this procedure contains warnings and precautions against maintenance methods that could cause injury to people, damage to devices or that could make them unsafe. These warnings do not cover all the ways in which maintenance, even if not recommended by ABB, may be performed, or the possible dangerous consequences that may arise from such actions.

Anyone who uses procedures and tools for maintenance, whether it is recommended by ABB or not prescribed, must make sure that his/her own safety and that of the devices is not compromised by the method and by the service tools used.

Should the need arise to obtain further information or should particular problems arise, and the information in this procedure is not sufficiently clear, please contact the ABB Service representative.

When the switchgear is left unattended, even momentarily, the buyer, installer or end user is responsible for ensuring that the hazard signs are positioned correctly, and that all access and control devices are locked securely. All the information contained in this procedure is based on the latest version of the product documentation available at the time of printing. We reserve the right to modify it at any time and without notice.

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Otomax fixed part

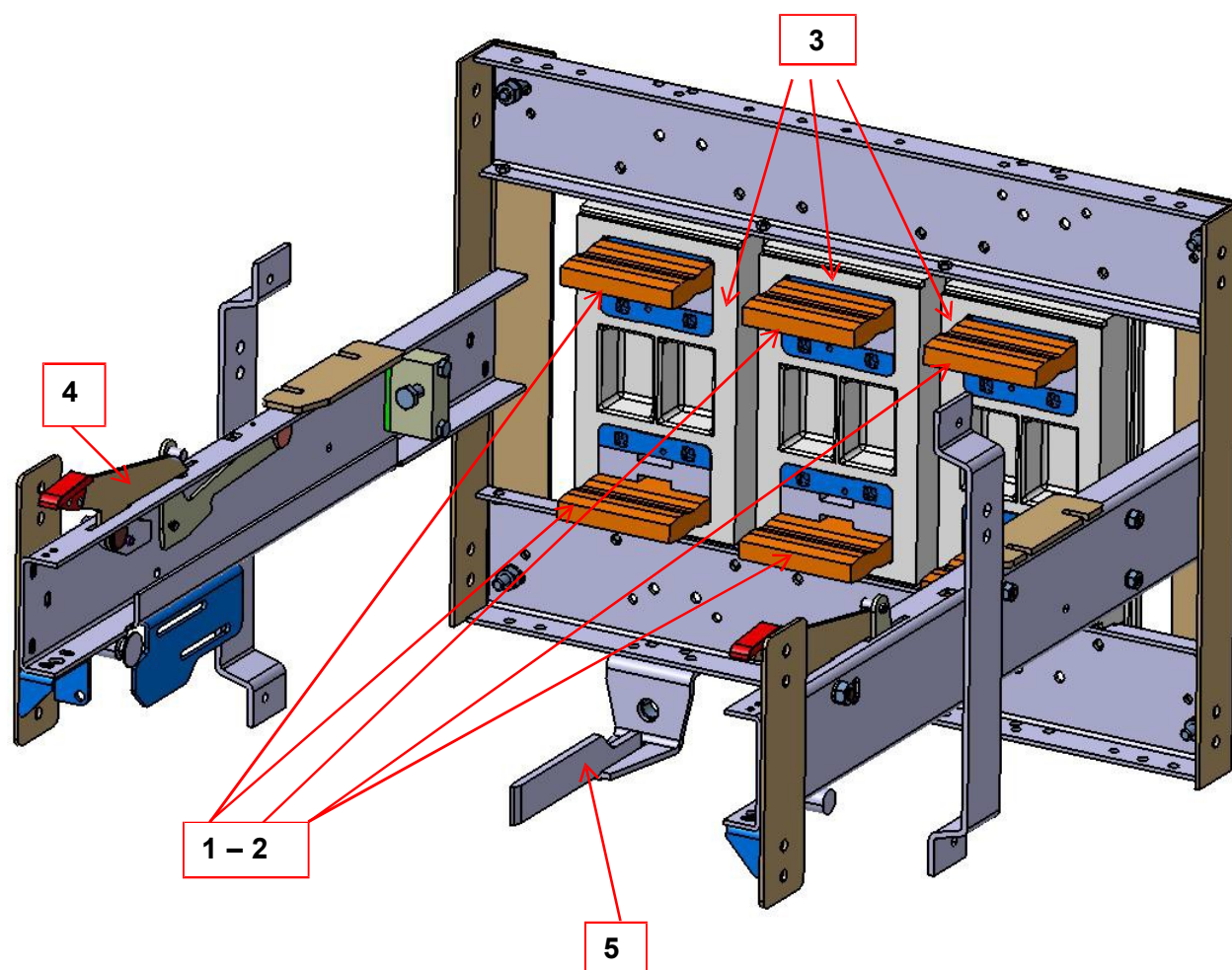
NOTE

Before continuing with the checks described below, please refer to the procedure “Selection Guide for Retrofitting kit Emax vs Otomax – Cradle in Cradle version” (1SDH001229R0001) to identify the version of the Otomax fixed part installed, and check that it is possible to use Cradle in Cradle kit version. If this is not possible please check the availability of Retrofill version kits.

Some versions of the fixed part have safety shutters that close off the internal part of the terminals when the movable part is racked-out. These shutters must be removed before the Cradle in Cradle (CiC) version of the kit is racked-in. Make sure that the previous class of protection remains unchanged. If not, it must be restored. Segregations able to ensure the IP20 protection class (or higher if required) must be provided by the installer and must comply with the dimensions of the switchgear cubicle.

1. Make sure that the studs are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the studs is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the studs is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Check the linkage mechanisms on the side supports of the fixed part for racking-in and locking the moving part, to make sure that they are not damaged. Check that they move smoothly (grease if necessary) and that the levers are not broken or misshapen. If this sort of damage or faulty operation is present, the fixed part cannot be reused.
5. Make sure that the plates of the earthing plate are not broken or misshapen and that the earthing plate itself is properly installed in its housing. The fixed part cannot be reused if the earthing plate is unable to function correctly.
6. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part of the Otomax circuit-breaker if necessary.
7. Check that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
8. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table TAB_A.

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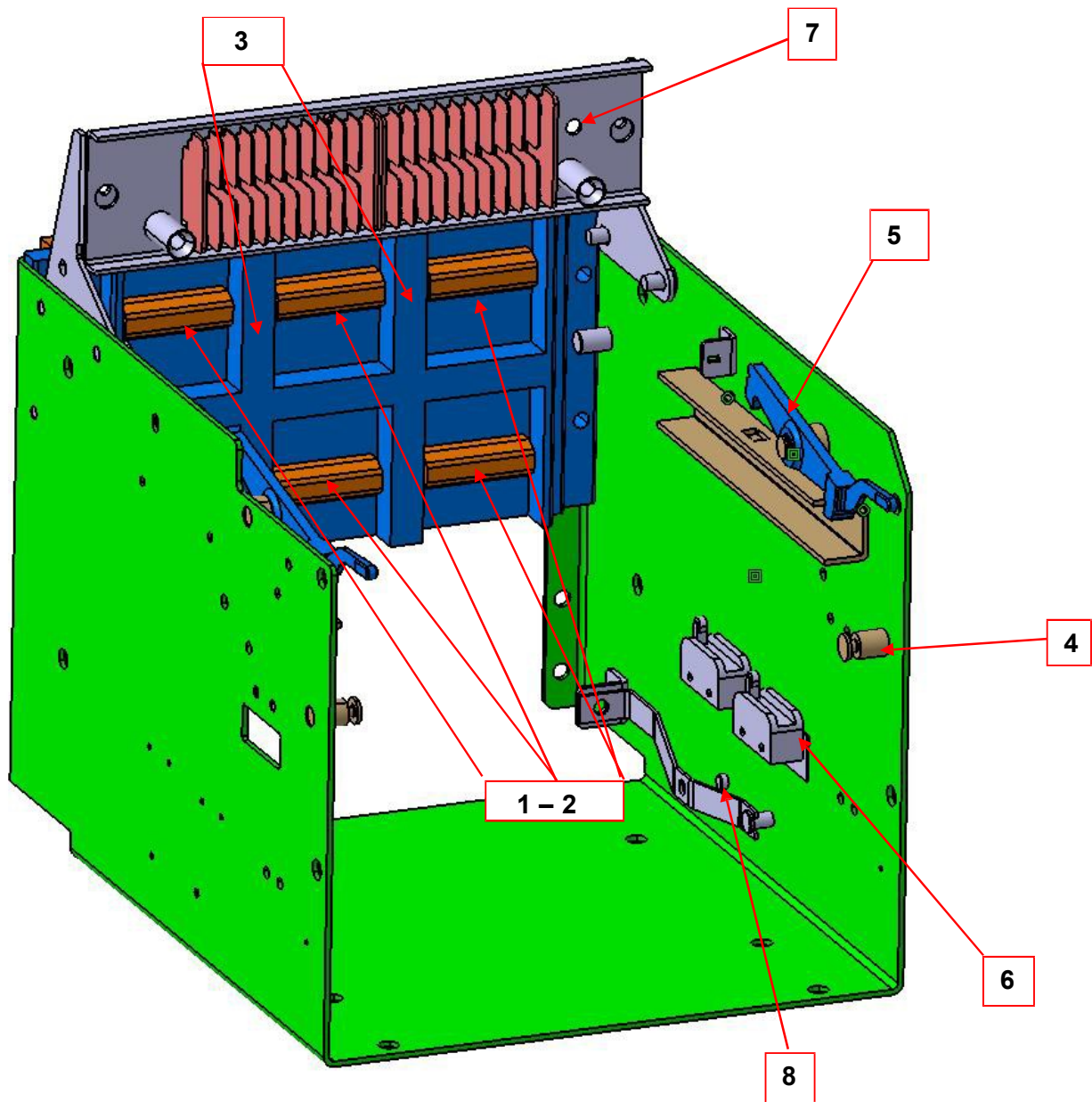
Novomax G30 fixed part

NOTE

Some versions of the fixed part have safety shutters that close off the internal part of the terminals when the movable part is racked-out. These shutters must be removed before the Direct Replacement (DR) version of the kit is racked-in. Make sure that the previous class of protection remains unchanged. If not, it must be restored. Segregations able to ensure the IP20 protection class (or higher if required) must be provided by the installer and must comply with the dimensions of the switchgear cubicle.


1. Make sure that the studs are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the studs is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the studs is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Check the pins that rack-in the moving part of the open door version, installed in the front part of the supports of the fixed part, to make sure that they are not damaged. The fixed part cannot be reused if these pins are damaged.
5. Check the linkage mechanisms on the side supports of the fixed part for locking the moving part, to make sure that they are not damaged. Check that they move smoothly (grease if necessary) and that the levers are not broken or misshapen.
6. Check the microswitches that signal the position of the moving part, installed in the lower part of the side supports of the fixed part, to make sure that they function correctly and are not damaged.
7. Make sure that the support of the sliding contacts is in a good condition and free to move. Also check that the plastic parts of these contacts are not damaged or cracked and that they do not show signs of overheating. If this device is faulty or damaged, the fixed part cannot be reused.
8. Make sure that the plates of the earthing plate are not broken or misshapen and that the earthing plate itself is properly installed in its housing.
9. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part of the Novomax G30 circuit-breaker if necessary.
10. Check that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
11. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table TAB_A.

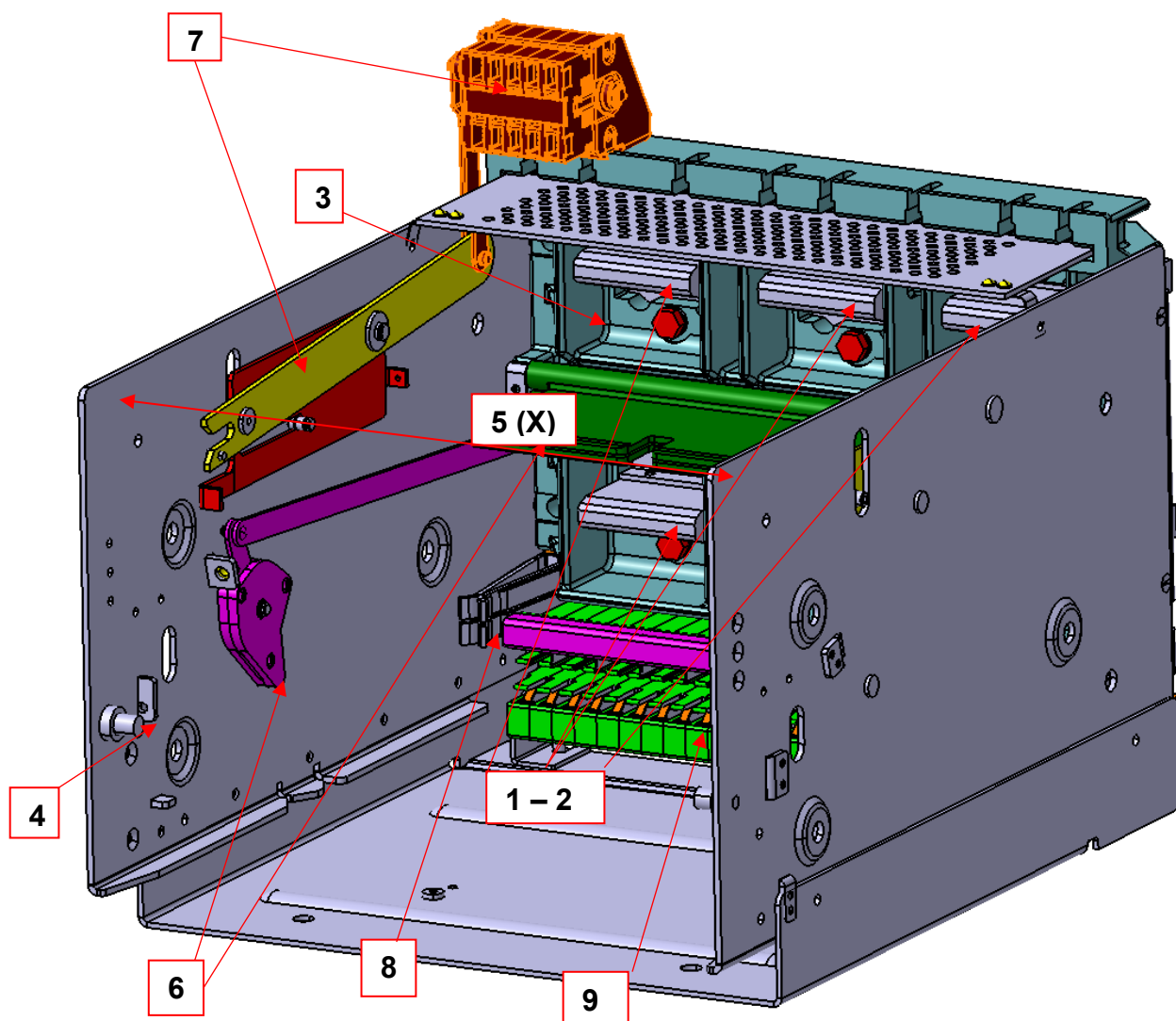
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Novomax G2 (1250-1600-2000A) fixed part

1. Make sure that the studs are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the studs is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the studs is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Check the pins that rack-in the moving part, installed in the front part of the supports of the fixed part, to make sure that they are not damaged. The fixed part cannot be reused if these pins are damaged.
5. Make sure that the fixed part width is according to the installation dimensions in the catalog. The fixed part cannot be reused if these dimensions are not correct.
6. Make sure that the opening linkage mechanisms of the stud shutters on the side supports of the fixed part are not damaged. Check that they move smoothly (grease if necessary) and that the levers are not broken or misshapen. Make sure that the stud shutters are not damaged, cracked, broken or misshapen. If the mechanism fails to function or is damaged, the fixed part cannot be reused.
7. Check that the operating levers of the auxiliary contacts are in a good condition, that they function properly (grease if necessary) and that they are not broken or misshapen. Make sure that the auxiliary contact is not damaged. Especially check that the plastic parts are not cracked or broken.
8. Make sure that the plates of the earthing plate are not broken or misshapen and that the earthing plate itself is properly installed in its housing. The fixed part cannot be reused if the earthing plate is unable to function correctly.
9. Make sure that the support of the sliding contacts is in a good condition and free to move. Also check that the plastic parts of these contacts are not damaged or cracked and that they do not show signs of overheating. If this device is faulty or damaged, the fixed part cannot be reused.
10. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part of the Novomax circuit-breaker if necessary.
11. Check that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
12. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table TAB_A.

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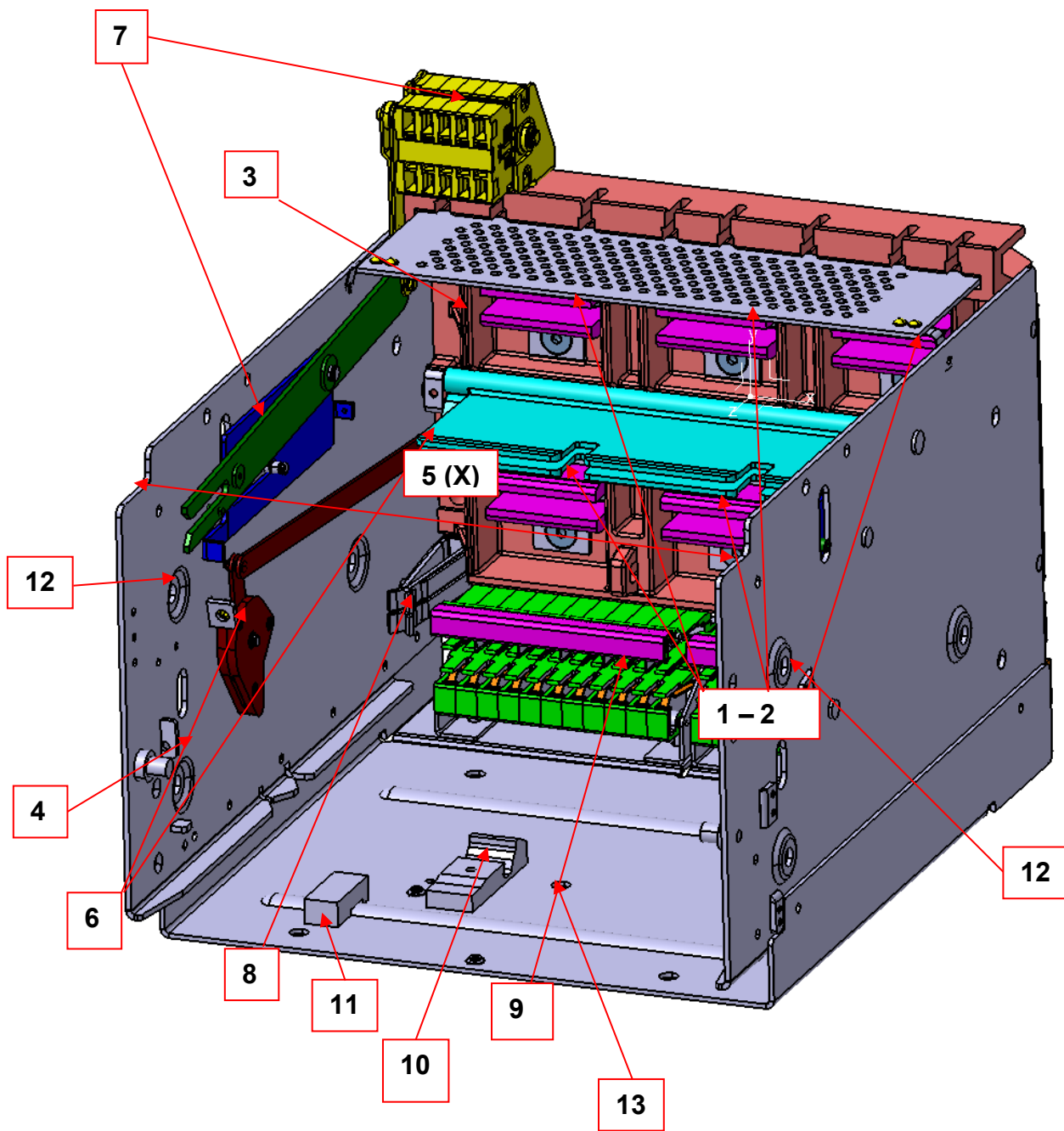
X (+2 / -0 mm)		G2
	III	334
	IV	429

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Megamax F1 – F2 – F4 – F5 fixed part

1. Make sure that the studs are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the studs is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the studs is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Check the pins that rack-in the moving part of the open door version, installed in the front part of the supports of the fixed part, to make sure that they are not damaged. The fixed part cannot be reused if these pins are damaged.
5. Make sure that the fixed part width is according to the installation dimensions in the catalog. The fixed part cannot be reused if these dimensions are not correct.
6. Make sure that the opening linkage mechanisms of the stud shutters on the side supports of the fixed part are not damaged. Check that they move smoothly (grease if necessary) and that the levers are not broken or misshapen. Make sure that the stud shutters are not damaged, cracked, broken or misshapen. If the mechanism fails to function or is damaged, the fixed part cannot be reused.
7. Check that the operating levers of the auxiliary contacts are in a good condition, that they function properly (grease if necessary) and that they are not broken or misshapen. Make sure that the auxiliary contact is not damaged. Especially check that the plastic parts are not cracked or broken.
8. Make sure that the plates of the earthing plate are not broken or misshapen and that the earthing plate itself is properly installed in its housing. The fixed part cannot be reused if the earthing plate is unable to function correctly.
9. Make sure that the support of the sliding contacts is in a good condition and free to move. Also check that the plastic parts of these contacts are not damaged or cracked and that they do not show signs of overheating. If this device is faulty or damaged, the fixed part cannot be reused.
10. Make sure that the latching system of the closed door version is in a good condition, without damage or cracks. The fixed part cannot be reused if this system is damaged.
11. Make sure, on F1-F2 fixed part, that the welded block is present. In case of closed door version, if not present, mount the supplied block.
12. Check that the fixed part is fixed on both sides by two screws as indicated in the installation instructions 600967592.
13. Check that the F1-F2 fixed part is fixed on the bottom by five screws as indicated in the installation instructions 600967592.

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X (+2/-0 mm)		F1	F2	F4	F5
	III	334	416	536	761
	IV	429	511	651	876

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14. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part of the Megamax circuit-breaker if necessary.
15. Check that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
16. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table TAB_A.
17. Check, on F4-F5 fixed part, the type of accessory mounted in order to choose the correct retrofit to use.
18. Make sure, on F4-F5 fixed part, that the hooking device for the closed door version / open door version is in good conditions and not damaged. The fixed part cannot be reused if this device is damaged.



Accessory for closed door moving part racking out




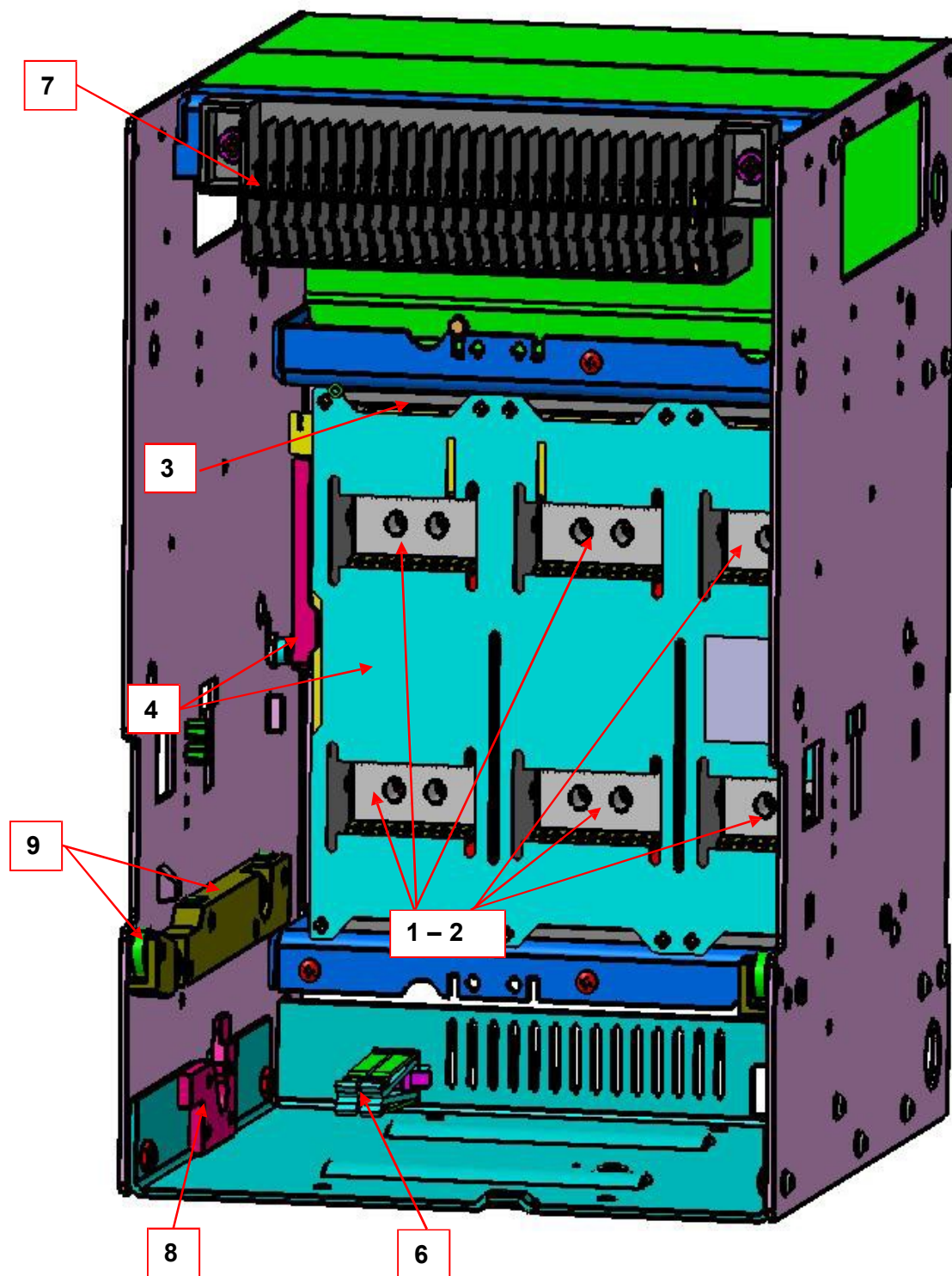
Accessory for open door moving part racking out

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Emax – New Emax E1 – E2 – E3 – E4 – E6 fixed part

1. Make sure that the clamps and terminals are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the clamps and terminals is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the terminals is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Check the condition of the opening linkage mechanisms of the terminal shutters, alongside the shutters themselves. Check that they move smoothly and that the levers are not broken or misshapen. Make sure that the terminal shutters are not cracked, broken or misshapen. If the mechanism fails to function or is damaged, order the relative spare parts from ABB.
5. Check the microswitches that signal the position of the moving part (if present), installed in the upper right-hand side of the fixed part, to make sure that they function correctly and are not damaged.
6. Make sure that the plates of the earthing plate are not broken or misshapen and that the earthing plate itself is properly installed in its housing. If they fail to function properly, order the relative spare parts from ABB.
7. Make sure that the support of the sliding contacts is in a good condition. Also check that the plastic parts of these contacts are not damaged or cracked and that there are no signs of overheating. If the mechanism fails to function properly or is damaged, order the relative spare parts from ABB.
8. Make sure that the latching system of the device for racking-in with the door closed is in a good condition, without damage or cracks. The fixed part cannot be reused if this system is damaged.
9. Make sure that the racking-in guides of the moving part are in a good condition and not damaged. Pay particular attention to the rollers, which must be free to turn. Lubricate them if necessary. If the mechanism fails to function properly or is damaged, order the relative spare parts from ABB.
10. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part of the Megamax circuit-breaker if necessary.
11. Check that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
12. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table TAB_A.

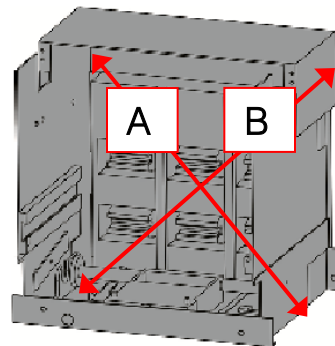
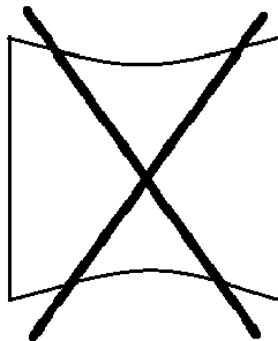
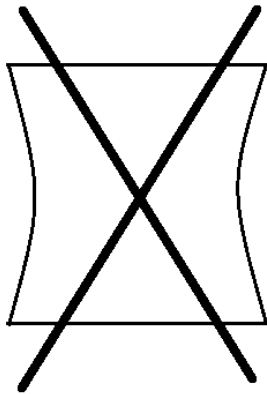
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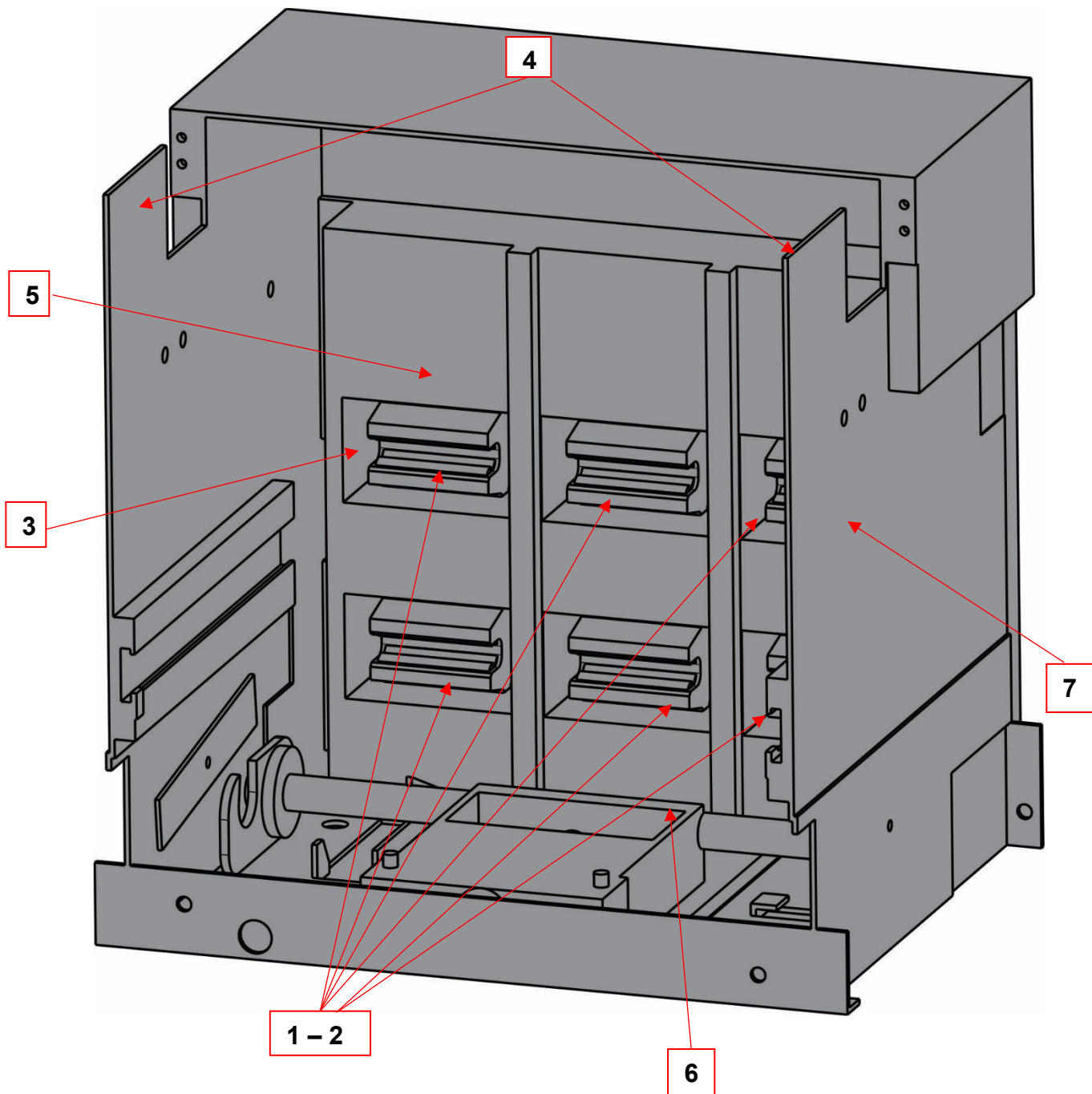
Masterpact fixed part M08-M10-M12-M16-M20-M25

1. Make sure that the jaw contacts are undamaged, with no traces of repulsion, short-circuiting or corroded copper. The fixed part cannot be reused if this sort of damage is present.
2. Make sure that the protective coating on the jaw contacts is in a good condition, without traces of oxidation or flaking silver-plating. Oxidation can be removed by careful cleaning with fine-grain sandpaper. The fixed part cannot be reused if the coating has partially flaked off.
3. Make sure that the plastic support that houses the jaw contacts is not cracked, broken or misshapen. The fixed part cannot be reused if this support is damaged.
4. Make sure that the diagonals measures are the same to be sure that the frame is not distorted or deformed.(A = B). Visually check that all the components are not deformed and that no bulges are present both inwards or outwards.



5. Make sure that the opening linkage mechanisms of the jaw contacts shutters on the side supports of the fixed part are not damaged. Check that they move smoothly (grease if necessary) and that the levers are not broken or misshapen. Make sure that the jaw contacts shutters are not damaged, cracked, broken or misshapen. If the mechanism fails to function or is damaged, the fixed part cannot be reused.
6. Make sure that there is no dust or carbon residues due to circuit-breaker operations as they would significantly reduce the insulation clearance. Clean the fixed part if necessary.
7. Make sure that the protective coatings of the materials are undamaged, e.g. paint coating on the plates and silver-plating of conductive parts. Remove traces of oxidation with fine-grain sandpaper.
8. Make sure that the screws on the fixed part are properly tightened, e.g. the screws that join the fixed part to the switchboard, the ones that fasten the terminals of the fixed part to the switchboard bars, earthing plates. If necessary, tighten to the required tightening torque value as indicated in the table [TAB_A](#).

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TAB_A tightening torque values, depending on the type of screw

Standard DIN 267		name		4.8		5.8		6.8		8.8		10.9		12.9	
		Former name		4S		5S		6S		8G		10K		12K	
metric screw	hexagon mm	Step		Step		Step		Step		Step		Step		Step	
		big mm	fine Mm	big Nm	fine Nm	big Nm	fine Nm	big Nm	fine Nm	big Nm	fine Nm	big Nm	fine Nm	big Nm	fine Nm
M4	7	0,7	-	1,3	-	1,6	-	1,9	-	2,5	-	3,5	-	4,2	-
				1,5	-	1,9	-	2,3	-	3,1	-	4,3	-	5,2	-
M5	8	0,8	-	2,5	-	3,1	-	3,7	-	4,9	-	6,9	-	8,3	-
				3,0	-	3,8	-	4,5	-	6,0	-	8,5	-	10,0	-
M6	10	1	-	4,2	-	5,3	-	6,4	-	8,5	-	12,0	-	14,0	-
				5,2	-	6,5	-	7,8	-	10	-	15,0	-	18,0	-
M8	13	1,25	1	10,0	11,0	13,0	14,0	15,0	16,0	20	22,0	29,0	31,0	34,0	37,0
				13,0	14,0	16,0	17,0	19,0	20,0	25	27,0	35,0	38,0	42,0	46,0
M10	17	1,5	1,25	20,0	21,0	25,0	26,0	30,0	32,0	40	42,0	57,0	59,0	68,0	71,0
				25,0	26,0	31,0	33,0	37,0	39,0	50	53,0	70,0	74,0	84,0	89,0
M12	19	1,75	1,5	34,0	36,0	43,0	45,0	52,0	54,0	69	72,0	97,0	101,0	116,0	121,0
				42,0	45,0	53,0	56,0	64,0	67,0	85	89,0	119,0	125,0	143,0	150,0

