

RAJA+ Direct Online Controller 3TE7121

For dependable service, it is of utmost importance that instructions given below are followed for selection, inspection, installation, commissioning, operation and maintenance.



RAJA+ Direct Online Controller

Selection of Controller

- Refer Table 1 for recommended selection of 3TE7 DOL Controllers.
- 3TE7121 controllers are available from 3HP/2.2kW to 10HP/ 7.5kW suitable for Submersible pump application motors.

Installation, Operation & Maintenance Instructions

Please read and understand these instructions before installing, operating or maintaining the equipment. Keep for future reference.

	Danger Hazardous voltage can cause death or serious injury. Disconnect power before working on equipment.
	Warning Automatic Motor Restart LMRA has "Auto" mode selection. Use this function with caution, Motor will restart automatically when healthy power is restored back. Reliable functioning of the equipment is only ensured with certified components. Commissioning and maintenance by qualified personnel only.
NOTICE This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which case the user may require to take adequate mitigation measures.	

Complies to standard : IS/IEC 60947-4-1

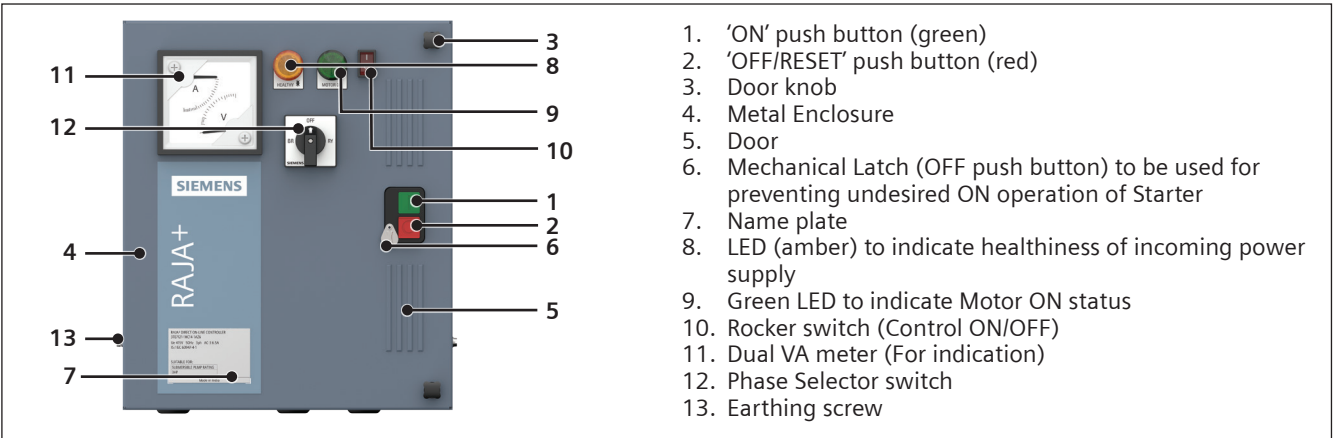


Fig. 1: DOL Controller

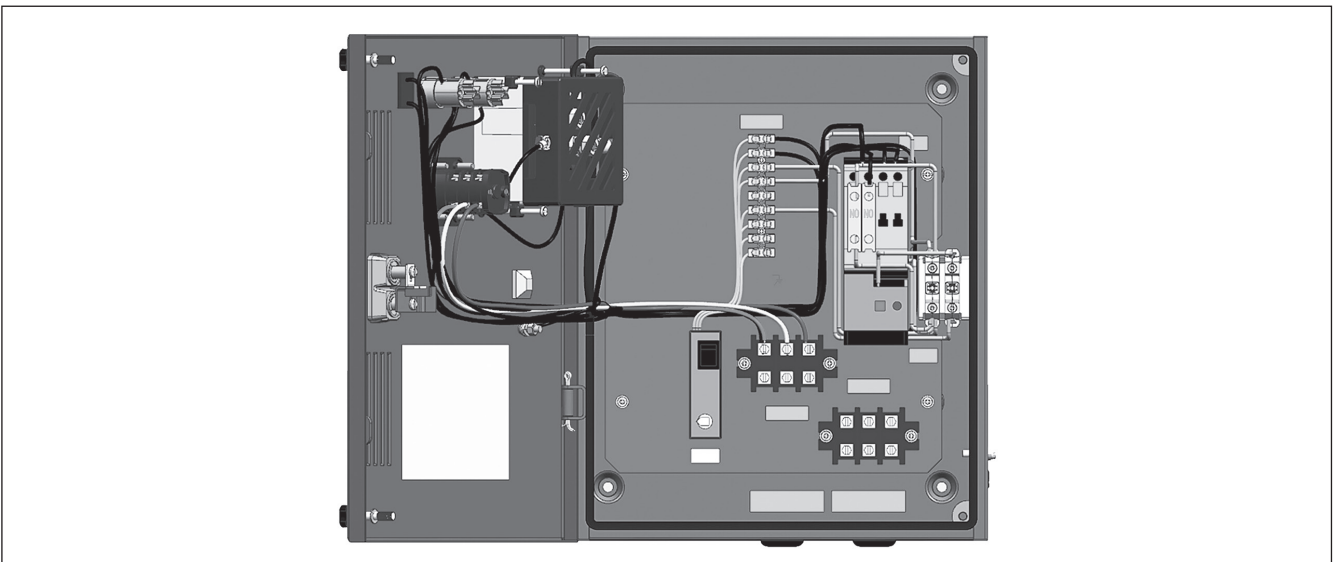


Fig. 2: DOL Controller inside view

Installation:

- Open the door by unscrewing the door knob.
- Mount the controller on a vertical wall / plate free from vibrations with proper nuts and bolts. Refer Fig. 6 for mounting dimensions.
- Remove the rubber grommets for the incoming and outgoing cable connections. (Refer Fig. 2).
- Connect incoming and outgoing cables as follows (Refer Fig. 2):
 - Use proper cable glands to ensure dust proofing. For conduit entry use packed washers.
 - Select correct size of cables from Table 1.
 - Remove approx. length of insulation as per following table:

Length of insulation removal (mm)	Cu cable size (mm ²)
6	2.5
5	1.5

- Connect line and motor cables exactly as per wiring diagram pasted inside the cover of the starter.
- Terminate the incoming supply cables on terminal block TB1 & outgoing cables to motor on terminal block TB2 (Tightening torque - Refer table 2).

NOTE: LMRA is set in Manual mode (Factory setting)

- Set the overload relay scale (Fig. 2) using proper screw driver as follows:
 - Set the overload relay to rated current mentioned on motor name plate.
 - Press green button of the contact block CB1 (Fig. 2) to start the motor and wait till it reaches to normal speed. Reduce the overload relay settings till it trips.
 - Set the overload relay at slightly higher value.
 - Allow a reset time appr. 4min. and reset the overload relay manually.
 - Restart the motor. If the relay does not trip, consider the overload relay as properly set.
If it trips, set it at little higher value and recheck.
 - Press the red knob (Fig. 2) on the overload relay to stop the motor.
 - Close the door by screwing the door knob.

Caution:

- **During commissioning or maintenance always ensure that the main supply is disconnected by switching off the main switch & Rocker switch.**
- If the relay trips even when set at rated motor current the suitability of the controller / relay for the particular application should be checked with the nearest Siemens office.

Operation:

- Ensure the door is locked.
- Rotate the Mechanical Latch away from OFF push button.
- Switch On the rocker switch marked 'I'.

- Check the status of amber LED. Wait till amber LED is continuously ON then only proceed.
- Depending upon Selector switch knob position for phase selection, Indication of incoming power supply voltage can be seen on Dual VA meter.
- For starting the motor, press Green push button marked 'I' (Fig. 1).
- Line current of R phase is indicated by Dual VA meter.
- Motor is ON when green LED is ON.
- For stopping the motor press Red push button marked 'O' (Fig. 1).
- For LMRA Auto / Bypass modes refer troubleshooting guide A5E50797230A.
- Reset Operation
 - If the overload relay trips, Reset manually. (Allow a reset time of approx. 4 min.)

Maintenance:

- Switch off the Controller and Put Latch on the OFF push button, (marked 'O'). **Disconnect the main supply by switching the main switch & Rocker Switch Off before doing any maintenance.**
- Keep the interior dust free.
- Re-tighten the terminal screws from time to time as per specified torque in table 2.
- No maintenance is needed for overload relay. Please do not open the relay.
- Replace contacts of the contactor if they were severely pitted or when only 40% of the original contact tips remains.
- Replacement of Overload Relay (Refer Fig. 3):
 1. Select a proper relay exactly as per the original.
 2. Slightly loosen the outgoing terminal screws of the relay.
 3. Disconnect the wires connected to the relay terminals.
 4. Slightly loosen the outgoing terminal screws of the line contactor.
 5. Follow instructions given in Fig. 3 for removal of relay.
 6. Ensure that new relay hook is engaged in the slot on contactor.
 7. Connect the relay terminals (L1, L2, L3) to (T1, T2, T3) of Q1 contactor.
Care should be taken to fix the relay terminals & relay to contactor in the exact position shown in Fig. 2.
 8. Tighten the contactor terminal (T1, T2, T3) screws.
 9. Connect the relay terminals to Terminal block TB2.
 10. Re-connect all the disconnected wires and check connections by referring to the wiring diagram. (Fig.4)

For more Technical details like LMR-A wiring, operating sequence, mounting details etc., refer Installation & Troubleshooting guide no. A5E50797230A.

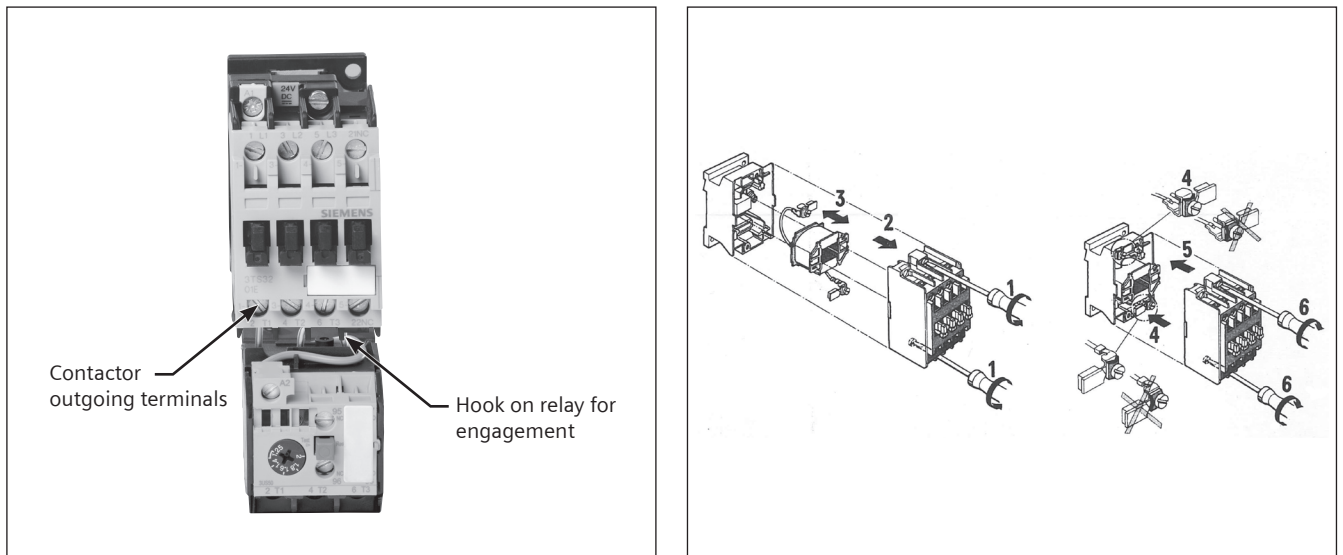


Fig. 3: Contactor – Relay Connection

Replacement of coil

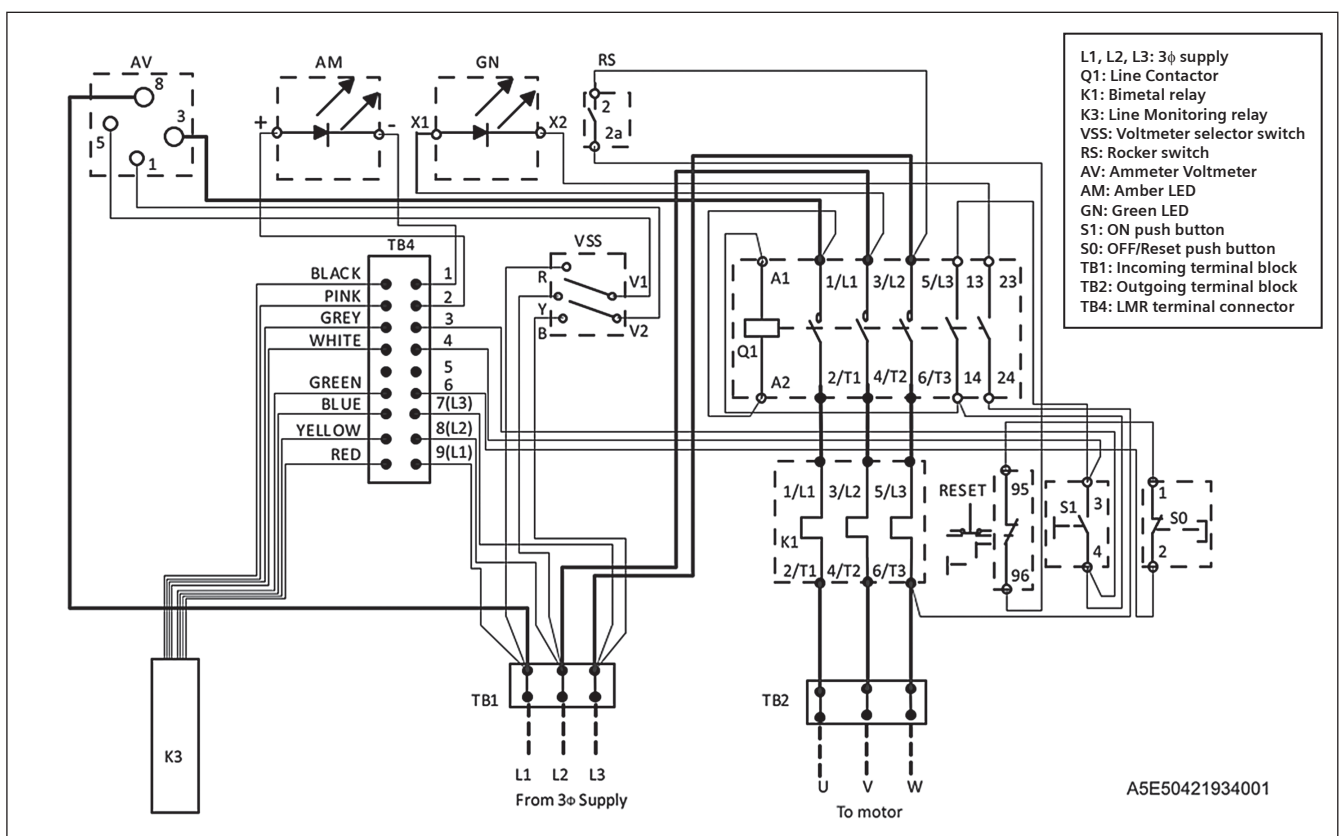


Fig. 4: Wiring Diagram

Table 1:

Motor / Submersible Pump Rating At 415V	Starter MLFB	Contactor MLFB	Thermal Overload relay MLFB	Range (A)	Max. Full Load Current (Amp) for Motor / Submersible Pump	Recommended Max. Back-up HRC Fuse rating Siemens Make type 3NA7 – 500V	Cu cable size (mm ²)
3 / 2.2	3TE7121-1HC14-1A**	3TS3010-0A**-08K	3US5000-1H8K	5–8	6.5	20	1.5
5 / 3.7	3TE7121-1KC16-1A**	3TS3110-0A**-08K	3UW5102-1K	8–12.5	10	25	1.5
6 / 4.5	3TE7121-2AC17-1A**	3TS3210-0A**-08K	3UW5102-2A	10–16	12		1.5
7.5 / 5.5	3TE7121-2BC18-1A**	3TS3210-0A**-08K	3UW5102-2B	12.5–20	14.5		2.5
10 / 7.5	3TE7121-2CC21-1A**	3TS3311-0A**-08K	3UW5202-2C	16–25	19.5	32	2.5

Selection of contactor coil and LMRA

Contactor coil voltage code **	Coil voltage (VAC)	Line Monitoring Relay
Z6	200 - 400	7UG0613-0FE20
Z8	260 - 460	7UG0613-0FF20

Table 2: Terminal torque values

Sr. No.	Type	Size	Torque (Nm)
1	3TS30..32 (Power wiring)	M3.5	0.8-1.4
2	3TS33 (Power wiring)	M4	1.0-1.5
3	Terminal block 30A	M4	0.8-1.4
4	Contact block 3SB5	M3.5	0.8-1.2
5	Coil Terminals A1/A2	M3.5	0.8-1.1
6	Aux. terminal of 3TS30/32	M3.5	0.8-1.1
7	3TX4001-2A/3TX4010-2A Aux. terminals	M3.5	0.8-1.1
8	Aux. terminals of all Bi-Relays	M3.5	0.8-1.2
9	3UW51/52, 3US50	M4	1.0-1.5
10	Indicating light – Amber/Green	M3	0.8-0.9
11	Dual VA Meter – Current terminals	M4	1.2
12	Dual VA Meter – Voltage terminals	M4	1.2
13	Multiway strips	M3	0.4-0.6
14	Selector Switch 3LD4	M3	0.5

Table 3 : Spares list

Sr. No.	Description	Order No.
1	Contactor	3TS3010-0AZ6-08K
2	Contactor	3TS3010-0AZ8-08K
3	Contactor	3TS3110-0AZ6-08K
4	Contactor	3TS3110-0AZ8-08K
5	Contactor	3TS3210-0AZ6-08K
6	Contactor	3TS3210-0AZ8-08K
7	Contactor	3TS3210-0AZ6-08K
8	Contactor	3TS3210-0AZ8-08K
9	Contactor	3TS3311-0AZ6-08K
10	Contactor	3TS3311-0AZ8-08K
11	Thermal Overload Relay	3US5000-1H8K
12	Thermal Overload Relay	3UW5102-1K
13	Thermal Overload Relay	3UW5102-2A
14	Thermal Overload Relay	3UW5102-2B
15	Thermal Overload Relay	3UW5202-2C
16	Coil for 200-400V	3TY7403-0AZ6
17	Coil for 260-460V (Z8)	3TY7403-0AW415
18	1NO Contact Block	3SB5420-0B
19	1NC Contact Block	3SB5420-0C
20	LMRA for 200-400V	7UG0613-0FE20
21	LMRA for 260-460V	7UG0613-0FF20
22	Phase selector switch	3LD4001-4DC30-ORCO
23	Add on block	3TX4010-2A
24	Add on block	3TX4001-2A
25	Amber LED	3SB5285-6HL33
26	Green LED	3SB5285-6HE06

NOTE: Contact sales for ON & OFF Push Button, Terminal block 30A, Dual VA meter, Door knob, Rocker switch.

For more Technical details like LMR-A wiring, operating sequence, mounting details etc., refer Installation & Troubleshooting guide no. A5E50797230A.

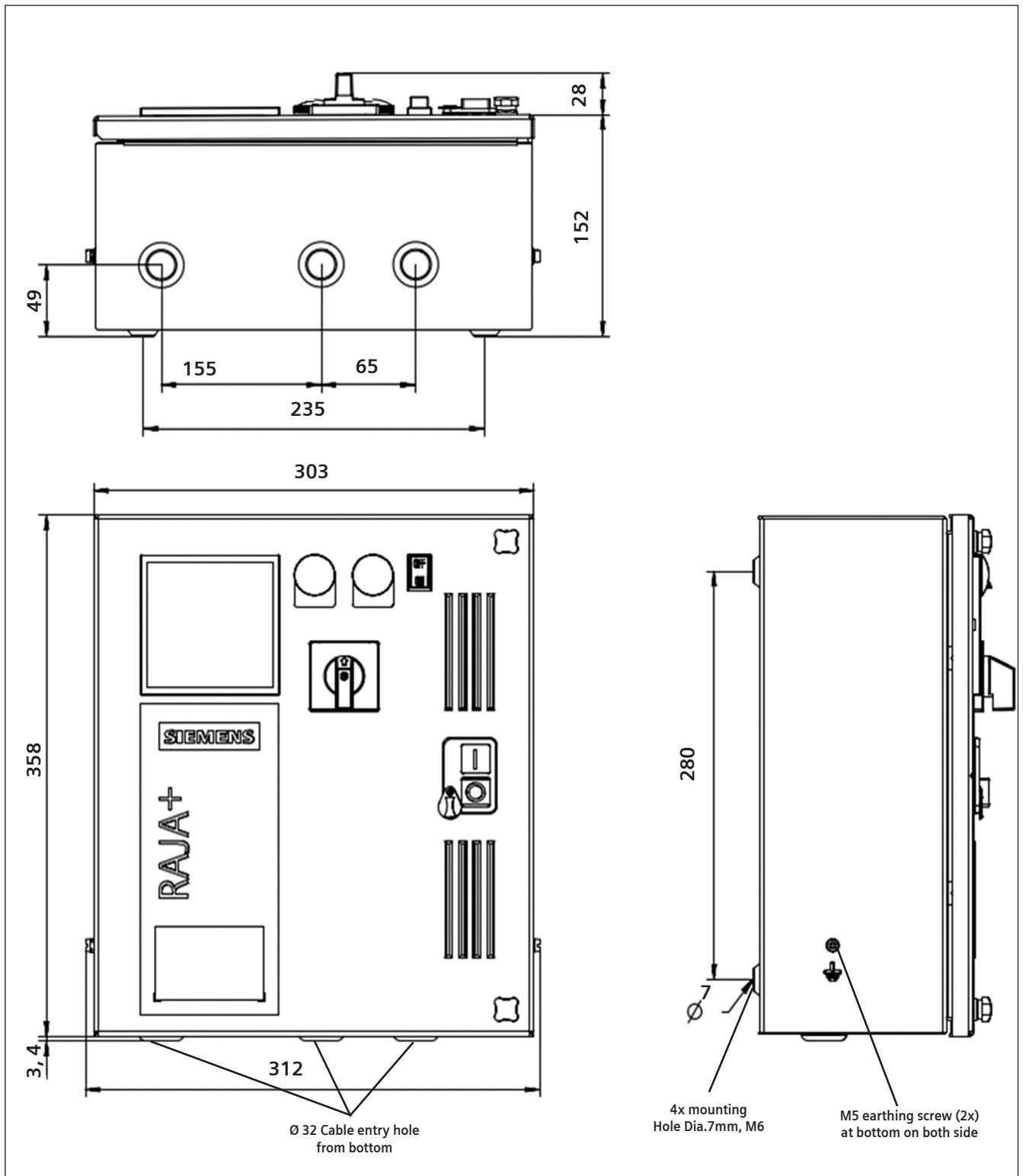


Fig. 5: Dimensional Drawing

Disposal

Siemens products are environment friendly, which predominantly consist of recyclable materials. For disposals we recommend disassembling and separation into following materials:

METALS: Segregate into Ferrous types for recycling through authorized dealer.

PLASTICS: Segregate as per material type for recycling through authorized dealer. Because of the long lifetime of Siemens Products the disposal guidelines may be replaced by other national regulations when taking the product out of service. The local customer care service is available at any time to answer disposal-related questions.