



MONO-TAKEDO[®] F.E.

INSTRUCTION MANUAL

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REL.	DATE	Verification and Approval R.T.

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1 - FUNCTIONING DESCRIPTION MONO-TAKEDO F.E.

MONO-TAKEDO F.E. is an analogue control speed regulator for single pole (4-6 poles) asynchronous three-phase lift motors.

It is suitable for any kind of single speed lift motors.

The comfortable ride that distinguishes lift fitted with this regulator is guaranteed by the special program curves designed to provide smooth speed variations, from start up to the electrical stop with the subsequent reclosing of the mechanical brake.

The application of MONO-TAKEDO F.E. in existing lifts too ensure optimum results. The ride comfort is improved and there is a decreasing by about 30% of the starting current. MONO-TAKEDO F.E. is easy to install, there is no overheating of the motor. The only phases controlled are the departure and the arrival, during high speed MONO-TAKEDO F.E. provides full voltage supply to the motor.

The feed-back signal become from a tachodynamo or from an encoder. SMS provide its own encoder very simple to install, it is particularly suitable for existing installations.

The torque applied to the lift motor is controlled by three pairs of SCR which regulate the voltage to the motor (4 or 6 poles). Braking is obtained by feeding single-phase rectified direct current to the same winding. Driving and braking action will be not contemporaneous as in ACVV speed regulators for two speed motors in order to prevent any short-circuit.

2 - SETTING TRIMMERS

P1 = Adjusts the overlap of braking on the power supply.

DO NOT ADJUST THIS TRIMMER.

P2 = HIGH SPEED setting (V2).

In cases where the MONOTAKEDO FE is not used to set the high speed (i.e. when J1 is inserted), this trimmer sets the slowing start.

In cases where the MONOTAKEDO FE controls the entire cycle, this trimmer sets the real high speed value.

P3 = LOW SPEED setting (V0)

Turn clockwise to increase the speed. This trimmer is set at SMS to 150 rpm for a 4-pole motor (1500 rpm).

P4 = Speed regulator **DYNAMIC GAIN** setting.

Turn clockwise to increase the correspondence between the real and the theoretical speeds. Setting the gain too high will cause annoying motor vibration. Set the system by adjusting P4 together with P7 (shunt circuit).

P5-P6-P9-P10 = Pulse setting.

DO NOT ADJUST THIS SETTING.

P7 = SHUNT CIRCUIT INTENSITY setting (**STABILITY**).

Turn clockwise to increase the importance of the shunt circuit. This setting must be adjusted together with the dynamic gain to provide a precise response without vibration.

This setting prevents a lift stop/restart at the end of eceleration.

P8 = START TORQUE setting.

This setting prevents counter-rotation of the motor in case of maximum imbalance and accelerates the lift start. Turn clockwise to increase the torque setting, i.e. to increase motor torque when the brake is released.

P11 = DECELERATION setting.

Turn clockwise to increase the deceleration time. Increasing the deceleration time provides smoother slowing and decreases the distance travelled at slow speed. The setting of this trimmer is linked to the position of the slowing contact of the switch in the lift shaft. If you wish to provide softer deceleration you must increase the slowing distance.

P12 = ACCELERATION setting.

Turn clockwise to increase the acceleration time and to provide a "SOFTER" start.

P13 = Encoder feedback setting.

DO NOT ADJUST THIS TRIMMER!

P14 = BRAKING TIME setting.

Turn clockwise to increase braking time. Braking time must be adjusted so that the brake is applied immediately the motor stops. Setting the braking time too long will cause unnecessary overheating of the motor.

P15 = BRAKING CURRENT INTENSITY setting.

Turn clockwise to provide more pronounced braking. This trimmer has already been set during testing.

ONLY ADJUST IF ABSOLUTELY NECESSARY.

3 - LED INDICATORS

L2 = When lit, indicates that the HIGH SPEED is on. This LED will only light up during high speed operation if the jumper J1 is inserted.

L3 = When unlit, indicates that there is a failure in the power supply to the motor and to the regulator. When voltage is fed to the input terminals of the MONOTAKEDO FE this LED MUST ALWAYS BE LIT. If this LED is unlit it indicates that the regulator is stopped due to a power failure.

4 - TEST POINTS AND VOLTAGES

TP1 = Tachogenerator or encoder response.

There must be a voltage of approximately 9V when the lift is operating at high speed.

TP2 = Speed regulator output.

TP3-4-6-7 = Synchronism for SCR switching.

TP5 = Speed program.

TP8 = Internal ground.

5 - JUMPERS

SEL1 = Selector jumper for tachogenerator or encoder feedback. This jumper is connected upwards if a tachogenerator is used and downwards if an encoder is used.

J1 = Function mode selector. With J1 inserted, control is provided at start and stop only. Without J1, control is provided at start, stop and at high speed.

J2 = Motor RPM selector. With the jumper inserted, the system is set for a 6-pole motor. Without the jumper, the system is set for a 4-pole motor.

J3 = 60 Hz operation. When inserted this jumper sets the regulator for operation with a 60 Hz power supply.

IF YOU ARE USING A 60 Hz POWER SUPPLY, INSERT THIS JUMPER.

SP1 = Bridged connection for 60 Hz tachogenerator/encoder signal.

6 - USE AND MAINTENANCE

The MONOTAKEDO FE powers motors up to 10 KW 380V capacity at an ambient temperature of 40°C.

Using the MONOTAKEDO FE will not derate the motor and only increases the motor operating temperature by a small amount. If the motor shows signs of overheating, check that the current on the three power supply phases is the same. If it is not the same, the MONOTAKEDO FE is faulty.

The MONOTAKEDO FE has been designed for a maximum nominal current of 30 A and for a start current of 120 A for two minutes.

Ensure that the components of the two electronic cards do not become covered with dust. Dust on the components can cause short circuits. Switch off the mains power supply and then clean the cards and components with a vacuum cleaner.

The components used on the MONOTAKEDO FE have been selected to provide large operating tolerances. They have undergone burn-in cycles to ensure that cases of early failure are reduced to the minimum.

Where the MONOTAKEDO FE is mounted externally, two covers are provided to make the unit "finger-proof" in accordance with current standards and regulations.

The fuses mounted on the unit are for the protection of the SCR only and are not intended for motor protection. The motor must be fuse-protected from the electrical panel in the same way as systems where a MONOTAKEDO FE is not fitted.

The unit has already been calibrated at our works prior to delivery but fine adjustments may be required to provide the most comfortable ride possible. Fine adjustments to ensure a comfortable ride are as follows:

- 1) If the motor delays the start of lift operation, turn the trimmer P8 clockwise. If the motor starts the lift with a jolt, turn the trimmer P8 anti-clockwise to obtain a smoother start.
- 2) If the motor accelerates too rapidly, turn P12 clockwise.
- 3) If the motor stops and then re-starts again at the end of deceleration, turn P4 and P7 clockwise.

NOTE: High settings on these trimmers can cause motor vibrations. Do not over adjust.

- 4) If the distance travelled at low speed is too long, turn P11 clockwise. If the lift passes the floor, turn P11 anti-clockwise.

- 5) If the system is set for electrical stopping, the exact sequence of operations is as follows: when the lift arrives at the floor the contact 1-2 opens and the motor is stopped electrically. After a pre-set time (set on trimmer P14), the relay RF (contacts on terminals 13, 14 and 15) is triggered and applies the mechanical brake.

- 6) If an electrical stop system is not being used, the contactors will be triggered and the brake will be applied immediately the lift arrives at the floor.

- 7) If you feel a noticeable jolt at the start of slowing, increase the high speed setting by turning P2 clockwise. If slowing is delayed with respect to the control panel command, turn P2 anti-clockwise until you obtain an optimum setting.

- 8) If the lift vibrates, turn P4 and P7 anti-clockwise a small amount at a time until the vibration stops.

- 9) The low speed setting has been set at SMS to 150 rpm. Do not change this setting unless absolutely necessary.

- 10) The brackets for the floor magnetic stop switches should be between 6 and 8 cm long for both up and down.

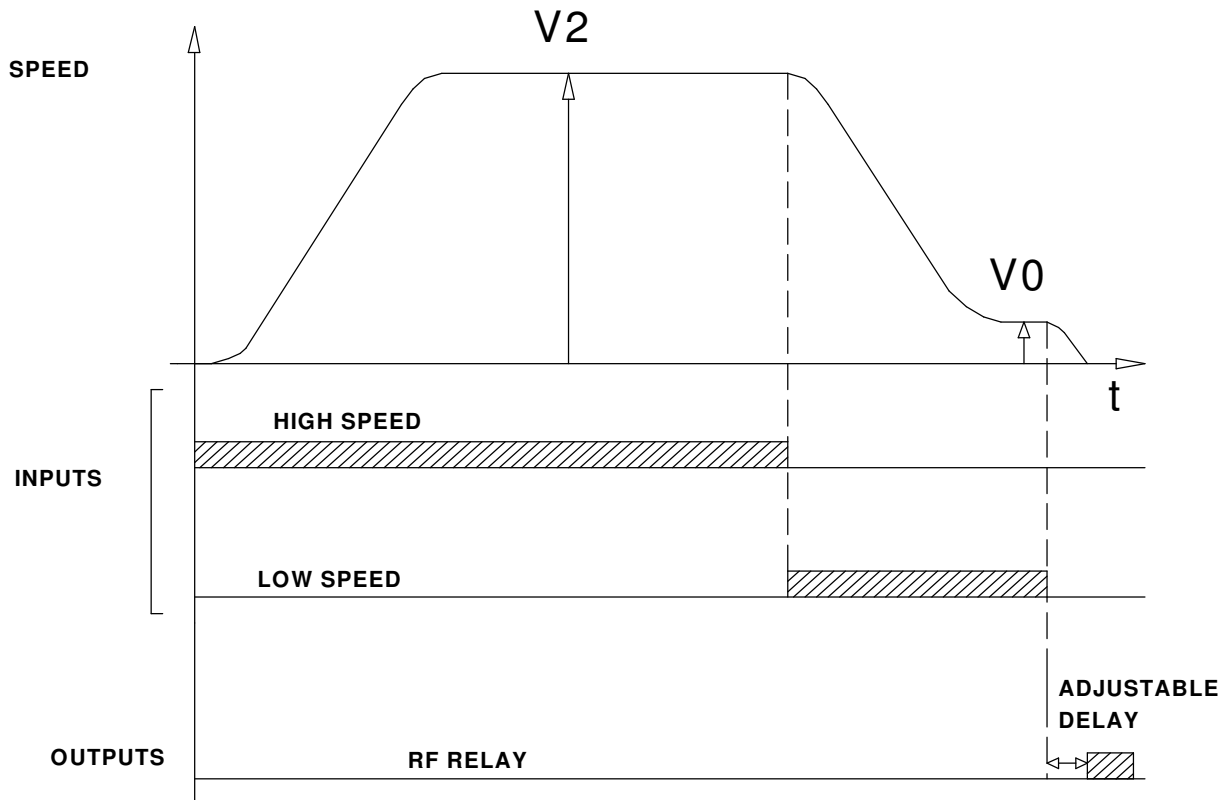
The MONOTAKEDO FE unit as provided by SMS, controls acceleration and floor arrival only. High speed regulation depends on the lift load.

Make a test run in the lift cabin to test your settings.

DO NOT ADJUST THE TRIMMERS P1, P13, P5, P6, P9 and P10 (these trimmers are tamper-evidency painted).

Slowing distances should be set as long as possible. For example, on a lift with a speed of 0.7 mt./sec. set the slowing distance to 1 metre.

CONTACT OPERATION DIAGRAM



LEGEND FOR MONO-TAKEDO F.E. REGULATION BOARD

REGULATION

P2	HIGH SPEED (V2)	P3	LOW SPEED (V0)
P4	REGULATOR GAIN	P7	STABILITY
P8	START TORQUE	P11	DECELERATION
P12	ACCELERATION	P14	STOP RELAY DELAY
P15	BRAKING CURRENT INTENSITY		

LEDS

L2	NO HIGH SPEED CONTROL	L3	ALARM
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JUMPERS

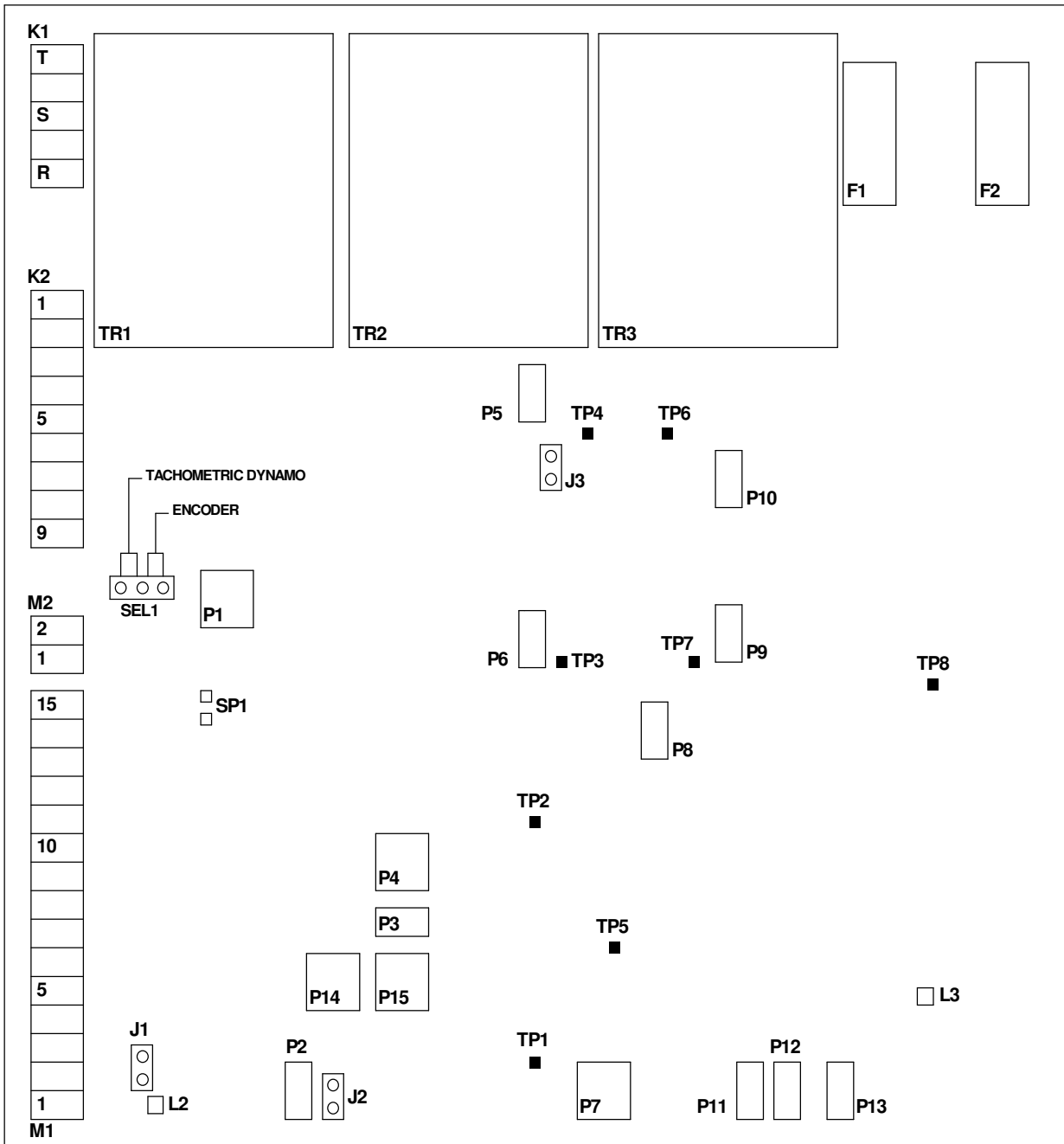
SEL1	TACHO GENERATOR OR ENCODER	J1	NO HIGH SPEED CONTROL
J2	6 POLES MOTOR	J3	60 HZ POWER SUPPLY

SP1 WITH SP1 50 HZ x TACO OR ENCODER, WITHOUT SP1 60 HZ

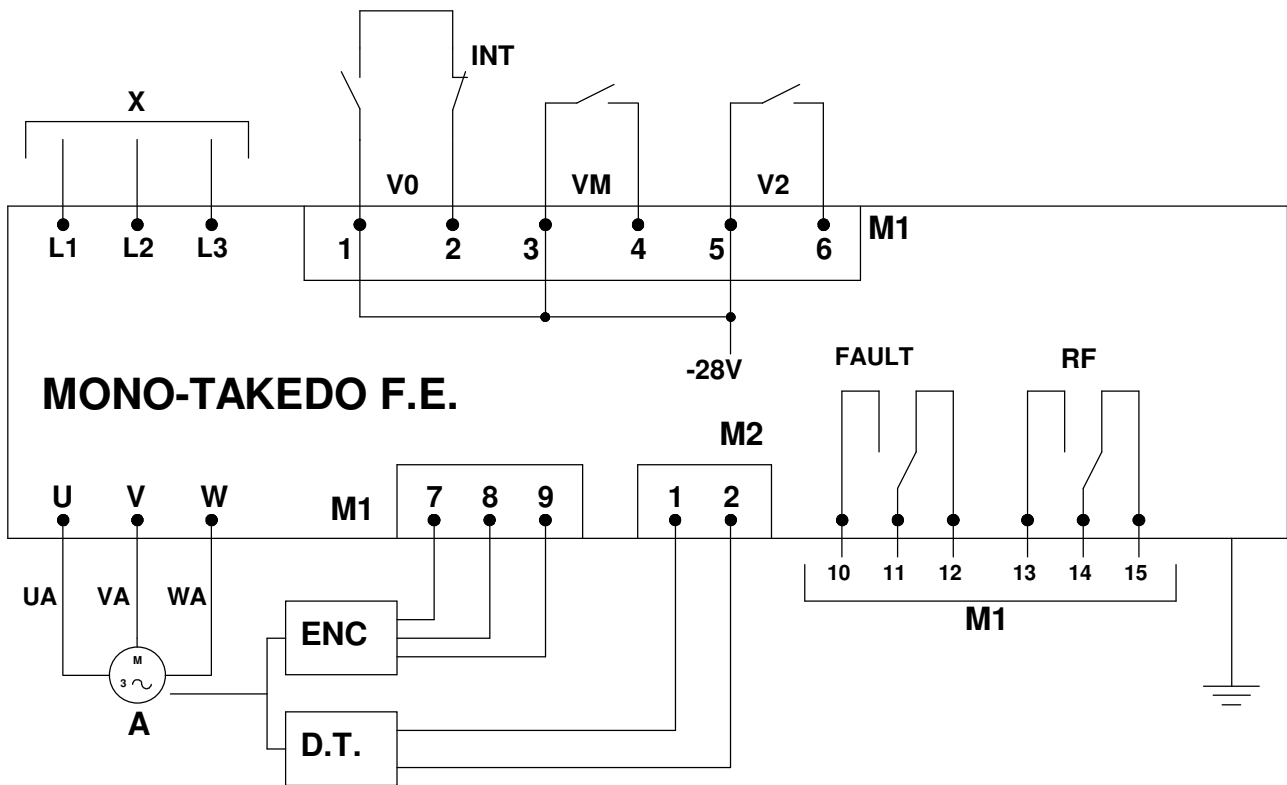
TEST POINT

- | | | | |
|------------|-------------------------|------------|------------------|
| TP1 | TACHO OR ENCODER SIGNAL | TP2 | REGULATOR SIGNAL |
| TP5 | SPEED REFERENCE | TP8 | 0 VOLT GND |
| | 5 of K2 + 28 V | | 1 of M1 - 28 V |
| | 7 of M1 + 15 V | | 8 of M1 - 15 V |

LAYOUT MONO-TAKEDO F.E. BOARD



MONO-TAKEDO F.E. CONNECTION



LEGEND

- | | | | |
|--------------|---------------------------|----------------|----------------------------------|
| A = | 4 / 6 poles 3-phase motor | D.T. = | Tachometric dynamo |
| ENC = | Encoder | FAULT = | Fault relay |
| INT = | Stop switch | M1 = | Terminal board M1 |
| M2 = | Terminal board M2 | RF = | RF relay |
| V0 = | Low speed | V2 = | High speed |
| VM = | Inspection speed | X = | To control panel with contactors |

NOTA: RF relay operate the brake with a delay adjusted in relation to triggering of V0.

7 - SLOWING DOWN DISTANCES IN LIFTS WITH MONOTAKEDO F.E.

CABIN SPEED	SLOWING DOWN DISTANCE
0.6 m/s	110 cm
0.7 m/s	120 cm
0.8 m/s	130 cm
0.9 m/s	140 cm
1.0 m/s	150 cm

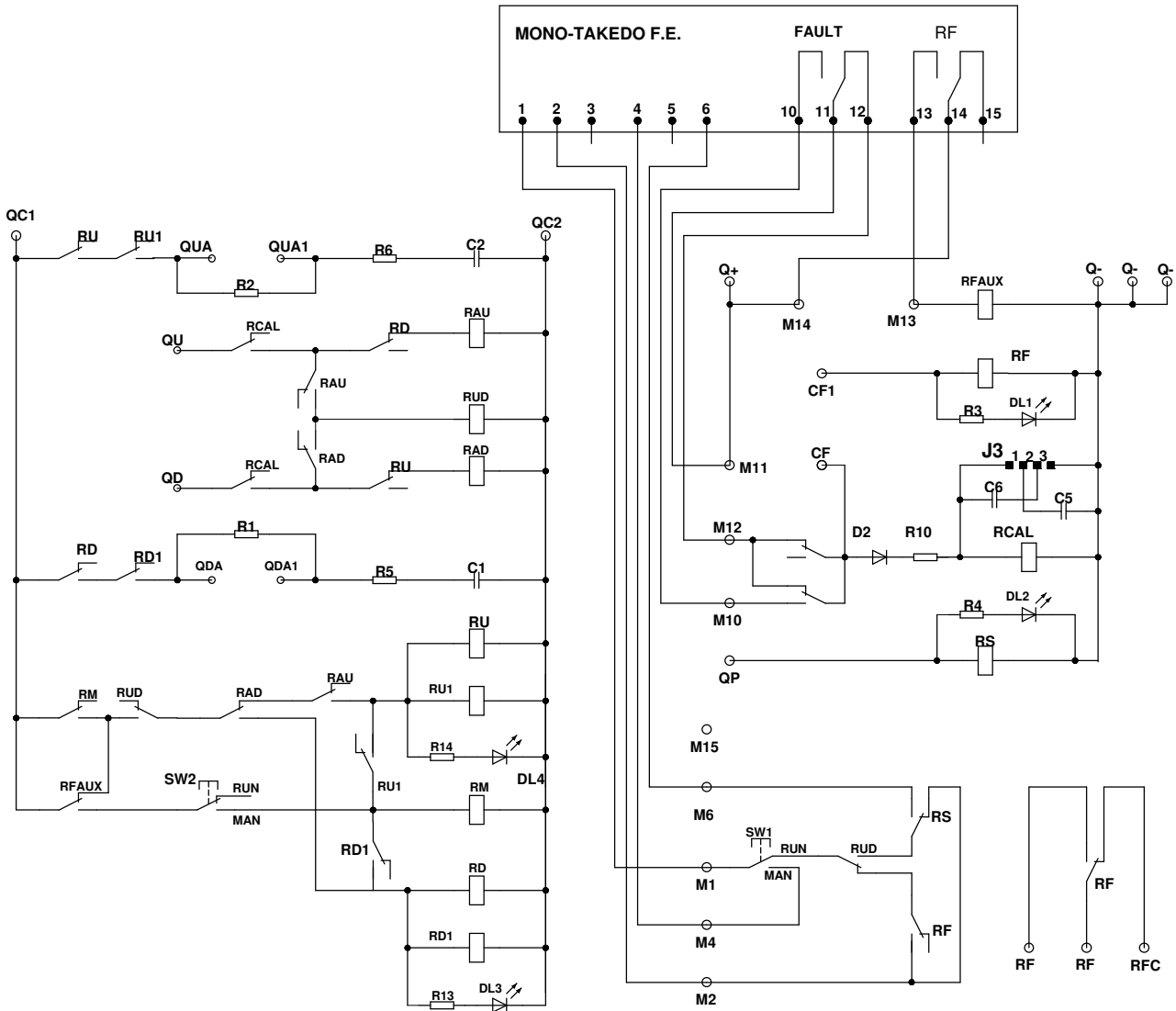
8 - INSTALLATION WITH 4AMON ADAPTER BOARD

101.06.4AMON adapter board is used to install MONO-TAKEDO F.E. in existing 1 speed control panels.

If you buy the board with MONO-TAKEDO F.E. you find the following connections between MONO-TAKEDO F.E. and adapter board:

M1, M2, M4, M6, M10, M11, M12, M13, M14 of 4AMON board connected to the terminals 1-14, of MONO-TAKEDO F.E. regulator board.

QC2 of 4AMON adapter board with Q- of the same 4AMON board.



J3: for 48 V make solders 1 and 3; for 110 V make solder 2.

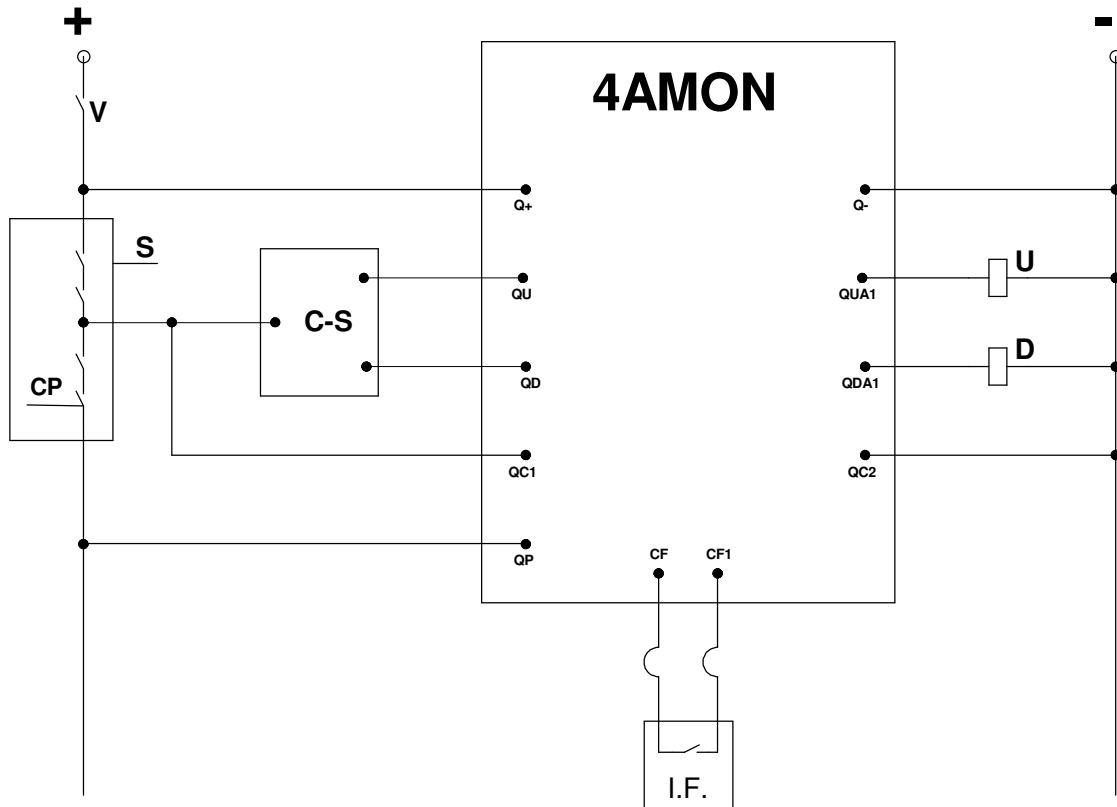
The final user have to make some connection as below:

- Q+ to the positive of control panel operating voltage (at the start of the safety chain).
- Q- to the negative of control panel operating voltage.
- QC1 to the safety chain to the supply of selector circuit.
- QP to the safety chain below the door contacts.
- Interrupt the supply to the UP and DOWN contactors coils.
- Connect the coil of UP contactor to the terminal QUA1.
- Connect the wire which bring supply to the UP contactor to the terminal QU.
- Connect the coil of DOWN contactor to the terminal QDA1.

- Connect the wire which bring supply to the DOWN contactor to the terminal QD.
- Connect the stop inductor contact (normally closed and open at floor) to the terminals CF-CF1.

You have at your disposal to the terminals RF-RFA a relay contact which works like the stop inductor contact (closed during the run and open at floor).

4AMON ADAPTER BOARD CONNECTION



LEGEND

- | | |
|-------------------------------|--|
| CP = Door contacts | U = Upward contactor |
| C-S = Selector circuit | V = Automatic valve |
| D = Downward contactor | + = Positive of operating voltage |
| I.F. = Stop switch | - = Negative of operating voltage |
| S = Safety chain | |

The above explanations are for a <<standard>> control panel, with DC operating voltage and with the negative of operating voltage connected to the ground of control panel.

For any further information contact:

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