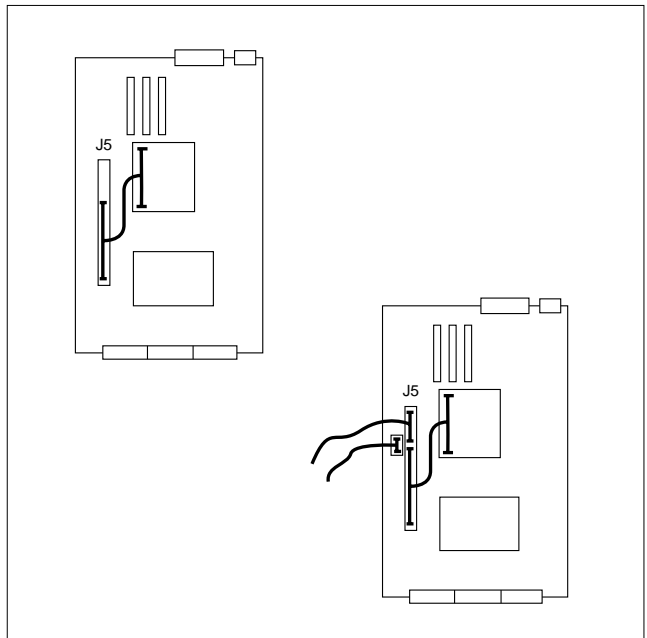


RECTIVAR[®] 4

Variateurs de vitesse
pour moteurs à courant continu
Speed controllers for DC motors

Carte option mouvement vertical
Optional vertical movement board



VW2-RLD 310

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Description, installation

Function

The optional vertical movement board for RECTIVAR 641 variable speed controllers has two functions:

- Braking logic which ensures correct operation of the motor/brake/controller set, particularly during a vertical movement.
- Current limitation versus speed past a predetermined speed threshold, particularly when operating at reduced flux.

Power consumption : + 15 V 13 mA and - 15 V 3 mA.



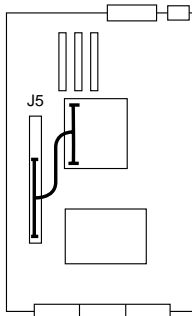
This board requires a tachogenerator speed feedback.

Installation of the option board

The board is delivered with a connecting ribbon cable terminated by connectors. The board is installed on the control board.

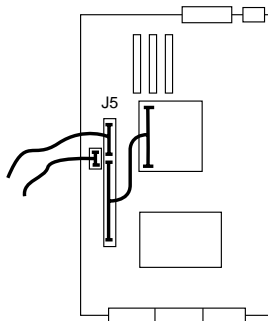
TWO CASES MAY BE ENCOUNTERED:

(1) RECTIVAR RTV-641 up to 650 A without the "controlled field" option:



- Remove the standard connector from terminal block J5 on the control board.
- Fit the option board and plug the connectors into J5-1 to J5-30 on the control board indicated below.

(2) RECTIVAR RTV-641 up to 650 A with the "controlled field" option and RECTIVAR 800 up to 3000 A (with built-in controlled field system):



- Remove the connectors from terminal block J5 on the control board from J5-1 to J5-24.
- Fit the option board.
 - If the control board is not fitted with a double terminal block J5-25 to J5-30, disconnect the mating connector (connection to the controlled field system) and install the adaptor provided as shown in the opposite figure. Plug the connector into the controlled field system, on the left-hand part of the adaptor, then plug the option board connectors into J5-1 to J5-30 as indicated below.
 - If the control board has a double terminal block J5-25 to J5-30, plug the option board connectors into J5-1 to J5-30 as indicated below.

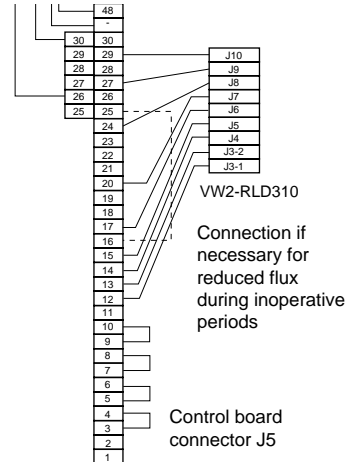
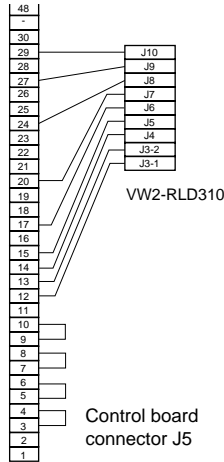
REMARK: IF THE I=f(N) FUNCTION IS NOT IN USE, SET THE "THRES" AND "IMAX/SP" POTENTIOMETERS TO THE ANTICLOCKWISE LIMIT.

Description, installation

Option board connection

Without "controlled field" system

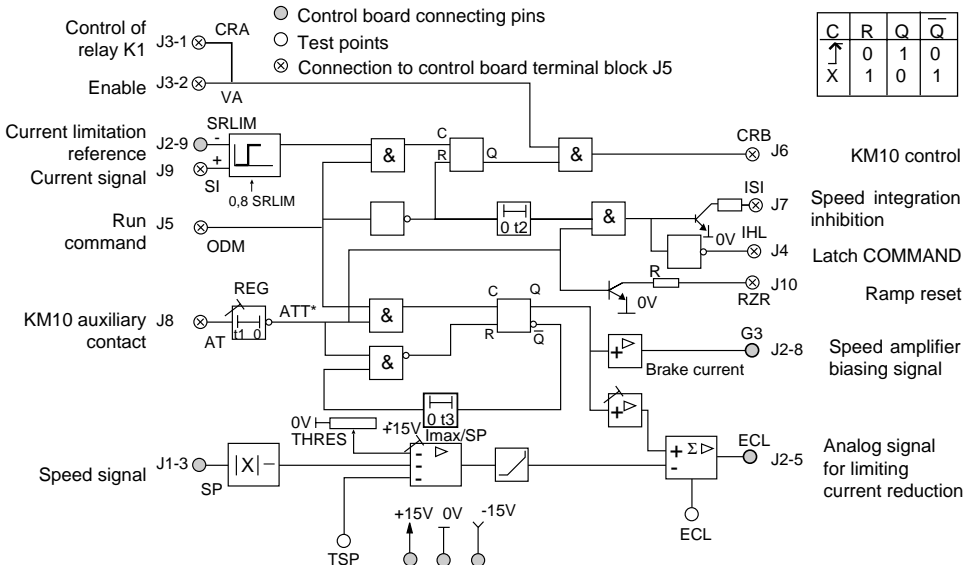
With "controlled field" system



Functional diagram

FLIP-FLOP TRUTH TABLE

C	R	Q	\bar{Q}
↑	0	1	0
X	1	0	1



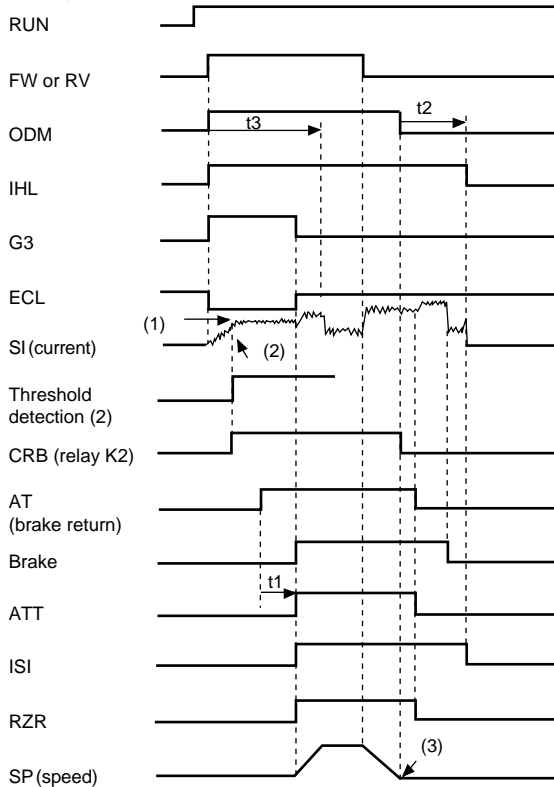
* BRAKE ASSEMBLY
ATT = 0

Hoist application

Operation brake logic

The purpose is to ensure that the machine develops a torque in the "up" direction which is capable of holding the load during the transient brake release phase. This is used to check the controller serviceability before the movement is enabled. Also, the control system is held during the transient brake release phase after electrical braking for stoppage.

This operation is illustrated by the timing diagram below which shows normal start and stoppage in the "up" direction.



(1) Current in the "up" direction regardless the controlled direction with a value adjusted by the "BRAKE CURRENT" potentiometer.

(2) Current detection threshold approximately equal to 0.8 times the current value set in (1).

(3) Zero rpm detection (2 % threshold of rated speed).

t_1 : Time delay set by the "REG" potentiometer so that the "ATT" signal is synchronized with the actual brake release. t_1 adjustment range : 12 milliseconds to 1.5 seconds.

t_2 : Time delay latching the controller after actual brake application : 0.85 seconds.

t_3 : Safety time delay setting G3 and ECL to zero if the brake remains applied after 1.7 seconds have elapsed.

Adjustments

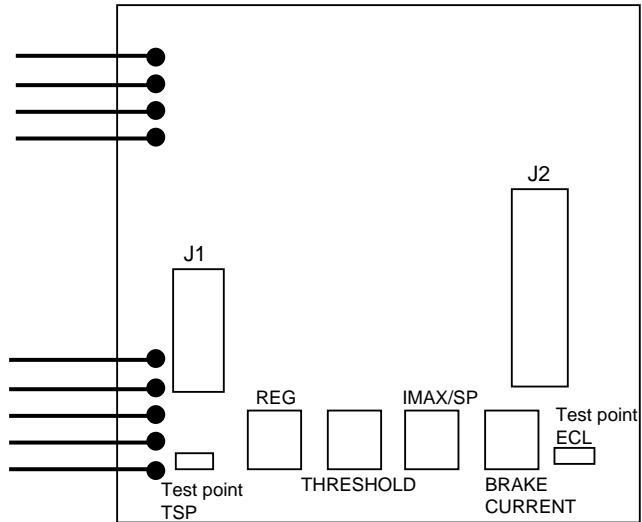
Take all precautionary measures to prevent the system from starting with a board out of adjustment as this might result in the fall of the load.

Equipment required

A multimeter with a preferred rating of 20000 Ω/V .

A potentiometer with an ohmic value ranging from 1 k Ω to 10 k Ω .

Potentiometers location



Brake logic function adjustment

Set the "REG" potentiometer to the anticlockwise limit.

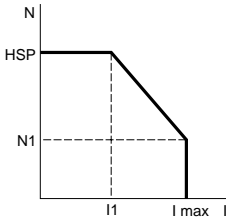
Adjust the "BRAKE CURRENT" potentiometer for a current value corresponding to the torque required to hold the rated load during inoperative periods.

Adjustments

I = f(N) function adjustment

The adjustment can be performed under static conditions with the controller locked.

- (1) Turn the "THRESHOLD" potentiometer anticlockwise.
- (2) Apply to test point "TSP" a negative voltage corresponding to the speed level N at which the limitation reduction should be activated, knowing that - 8 V corresponds to the maximum speed of the machine.
Connect a voltmeter across test point "ECL" on the optional board and test point "0 V" on the "Adjustment" card.
Turn the "THRESHOLD" potentiometer clockwise until a slightly negative voltage is read at "ECL".



Example : 3000rpm motor speed = 8 V ("SP")

"I = f(N)" cuts in at 1500 rpm (4 V at "SP"). Therefore, apply - 4 V to "TSP", then turn "THRESHOLD" clockwise until 0 V - ε is read at "ECL".

"I_{max}/SP" adjustment : 0 V at "ECL" corresponds to the RECTIVAR limiting current value. - 10 V at "ECL" corresponds to zero current.

Apply - 8 V (corresponding to "HSP") to "TSP" and adjust "I_{max}/SP" for the motor current limiting value I₁ for "HSP".

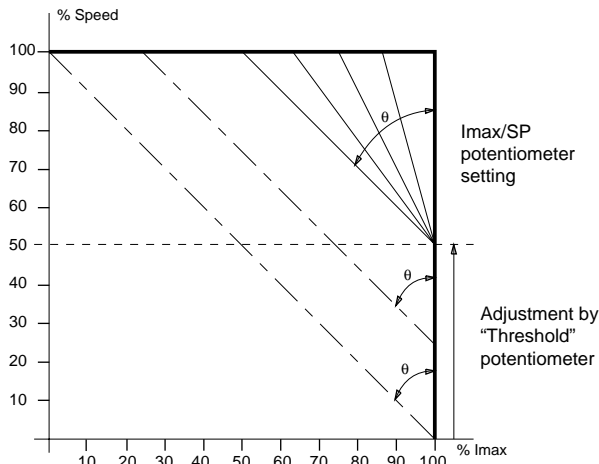
Example : If the desired limiting value I₁ for - 8 V "TSP" is 0.5 I_{max}, adjust "I_{max}/SP" for - 5 V at "ECL".

Adjustment limits :

The limiting current reduction ratio can be adjusted within limits which depend on the selected speed threshold (see the curve below).

CAUTION :

The use of this function combined with the field cut-off function requires the usual precautionary measures for vertical movements and, in particular, reference validation related to load weighing.



θ max drooping angle for current kimitation (I_{max}/SP turned to the anticlockwise limit).

