

DMV 201 **Unidirectional single-phase controller** **for direct current motor** **Installation and maintenance manual**

NOTE

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WARNING

- For user safety, this controller should be earthed. (\perp)
- The controller is fitted with safety devices which can, in the case of certain faults, stop the controller and the motor. The motor itself can be jammed by mechanical means. Finally, voltage fluctuations, and particularly power cuts can also cause the controller to switch off.
- The removal of the cause of the shutdown can lead to restarting, with consequent hazard for certain machines or installations, particularly those complying with the decrees of 15th July 1980 concerning safety.

In these cases, therefore, it is important for the user to protect against such risks of restarting, by fitting a zero speed detector which will cut the supply to the controller, in the case of unprogrammed stoppages.

This equipment meets existing standards. Nonetheless, it may create interference and the user accepts responsibility for carrying out the appropriate action to eliminate such interference.

AS A GENERAL RULE, ANY WORK ON THE MACHINE OR INSTALLATION, WHETHER ELECTRICAL OR MECHANICAL, SHOULD ONLY BE CARRIED OUT AFTER THE POWER SUPPLY TO THE CONTROLLER HAS BEEN SWITCHED OFF.

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1 - GENERAL

- THE UNIT MUST BE MOUNTED IN A VERTICAL POSITION SO THAT AIR CAN CIRCULATE FROM BOTTOM TO TOP THROUGH THE FINS ON THE EXTRUDED COOLER HOUSING.
- DO NOT PLACE NEAR HEAT HEATED DEVICES.
- MAINTAIN A MINIMUM DISTANCE OF 50 to 100 mm AROUND THE UNIT (SEE FIG.1).
- THE SURROUNDING ENVIRONMENT MUST CONFORM WITH THE FOLLOWING RULES:
 - . TEMPERATURE 40°C (MAXIMUM 60°C DERATED BY 1.2% PER °C OVER 40°C).
 - . AIR MUST BE FREE OF METAL OR CORROSIVE DUST.
 - . MAXIMUM HYGROMETRY 85% WITH NO CONDENSATION.
 - . VIBRATION LEVEL COMPATIBLE WITH ELECTRONIC HARDWARE.
 - . A UNIT WITH A PROTECTION LEVEL IPOO MUST BE PLACED IN AN ENCLOSURE OR PREMISES THAT MEET THE ABOVE REQUIREMENTS.
 - . OPERATING ALTITUDE < 1000M. DERATE THE UNIT BY 0.7% PER 100 METRES ABOVE THIS LIMIT.

CONTROLLER LOCATION

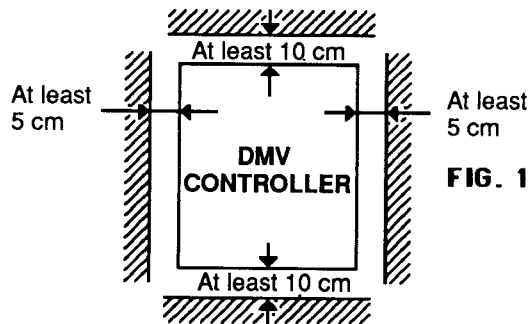


FIG. 1

2 - OVERALL DIMENSIONS

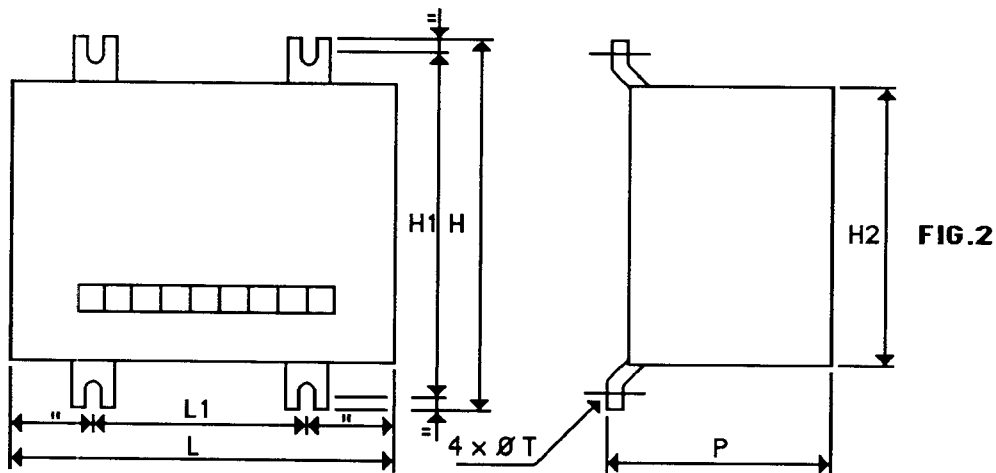




FIG.2

DMV 201	H	H1	H2	L	L1	P	ØT	WEIGHT
6 A	220	200	150	220	170	134	6	2,5
12 A	220	200	150	220	170	134	6	2,5
24 A	270	250	200	220	170	134	6	3,1
48 A	350	330	280	220	170	134	6	4,3

3 - TECHNICAL CHARACTERISTICS

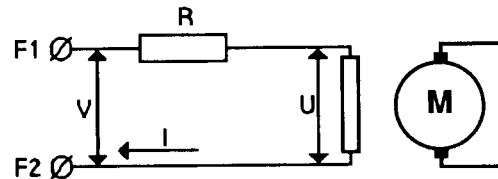
3 - 1 RATINGS

SINGLE-PHASE MAINS 50 OR 60 HZ		CONTROLLER	SUPPLY TO MOTOR			
VOLTAGE V. (R. M. S.)	CURRENT A. (R. M. S.)		ARMATURE		FIELD	
			VOLTAGE V	CURRENT A	VOLTAGE V	CURRENT A
220 / 240 ± 10%	9	DMV 201 - 6	0 to 180	6	100 or 190*	1
	18	DMV 201 - 12		12		1
	36	DMV 201 - 24		24		2
	72	DMV 201 - 48		48		2
and 380 / 415 ± 10%	9	DMV 201 - 6	0 to 310	6	170 or 340*	1
	18	DMV 201 - 12		12		1
	36	DMV 201 - 24		24		2
	72	DMV 201 - 48		48		2

* PERMISSIBLE VOLTAGES FOR 220V OR 380V ± 10% MAINS
WHEN DIFFERENT MAINS ARE USED, CHECK THE FIELD VOLTAGE OF
THE MOTOR (U. Rec = 0.9 x U MAINS, JUMPER E2  OR 0.5 x U MAINS JUMPER E2  -
SEE PAGE 7). ADD AN ADAPTATION RESISTOR IF NECESSARY.

$$R = \frac{V. Rec - U \text{ motor field}}{I \text{ motor field}}$$

$$P = R \times (I \text{ motor field})^2$$



IMPORTANT REMARK:

IF THE FIELD VOLTAGE SUPPLIED BY THE CONTROLLER IS NOT USED
(PERMANENT MAGNET MOTOR FOR EXAMPLE), CUT STRAP MP6.

3.2 PERFORMANCES OF STANDARD CONTROLLER (DYNAMIC CHARACTERISTICS)

PARAMETERS	VARIATION AMPLITUDE	SPEED DEVIATION (IN RELATION TO NOMINAL SPEED)	
		MOTOR WITH BR	MOTOR WITHOUT BR
MAINS VOLTAGE	± 10 %	< 0,2 %	0,3 %
AMBIENT TEMP. (1) (BETWEEN 0 AND 40 °C)	PER DEGREE C	0,1 %	0,1 %
LOAD	0 to 100 %	< 0,1 % (2)	< 3% (2)

(1) IF AMBIENT TEMP. EXCEEDS 40°C, DERATE THE CONTROLLER
RATING BY 1.2% PER EXTRA DEGREE C (MAX. ALLOWED 60°C).

(2) AT STABLE OPERATING SPEED

4 - GENERAL OPERATING PRINCIPLE

BRIEF DESCRIPTION OF MAIN STAGES

THE CONTROLLER CAN BE DIVIDED INTO FOUR SECTIONS: (FIG 3)

① POWER SUPPLIES (REFER TO DIAGRAM ON PAGE 21)

- ± 15 V POWER SUPPLY - REGULATION CIRCUIT
- ± 10 V POWER SUPPLY - CONTROL SIGNAL DISPLAY
- ± 8 V POWER SUPPLY - CURRENT SENSOR
- ± 30 V POWER SUPPLY - CONTROLLER LOCK

② MOTOR POWER SUPPLY (ARMATURE AND FIELD COIL)(REFER TO DIAGRAMS ON PAGES 23 AND 34).

- . COMPOUND DIODE/THYRISTOR BRIDGE SUPPLIES ARMATURE
- . HALF OR FULL-WAVE BRIDGE SUPPLIES FIELD COIL
- . CONTROLLED LEAD ANGLE SYNCHRONIZATION

③ SPEED AND CURRENT REGULATION - CONTROL SIGNAL DISPLAY(REFER TO DIAGRAM ON PAGE 22)

CONTROL SIGNALS	}	- SPEED CURRENT SETTING 0 - 16 mA ; 0 - 20 mA ; 4 - 20 mA
		DISPLAY VOLTAGE SETTING 0 - 10V
		- MINIMUM SPEED N PRE-DISPLAYED
		- GRADIENTS - ACCELERATION AND DECELERATION
		- MAXIMUM ARMATURE CURRENT DISPLAYED
IMAGES	}	- SPEED FEEDBACK BY TACHO GENERATOR
		OR
		- SPEED CALCULATED ON REPORTED ARMATURE SETTING VOLTAGE
		- ARMATURE CURRENT FEEDBACK BY HALL EFFECT CELL
		} N MAX NOMINAL
REGULATION	}	- SPEED + ADJUSTABLE RI COMPENSATION
		- CURRENT

④ SAFETY DEVICES AND AUXILIARIES

I x T SAFETY : AUTHORIZES AN OVERLOAD OF 1.5 TIMES NOMINAL MOTOR CURRENT FOR APPROX. 10 SECONDS; CONTROLLER LOCKS IF SAFETY DEVICES CUTS IN

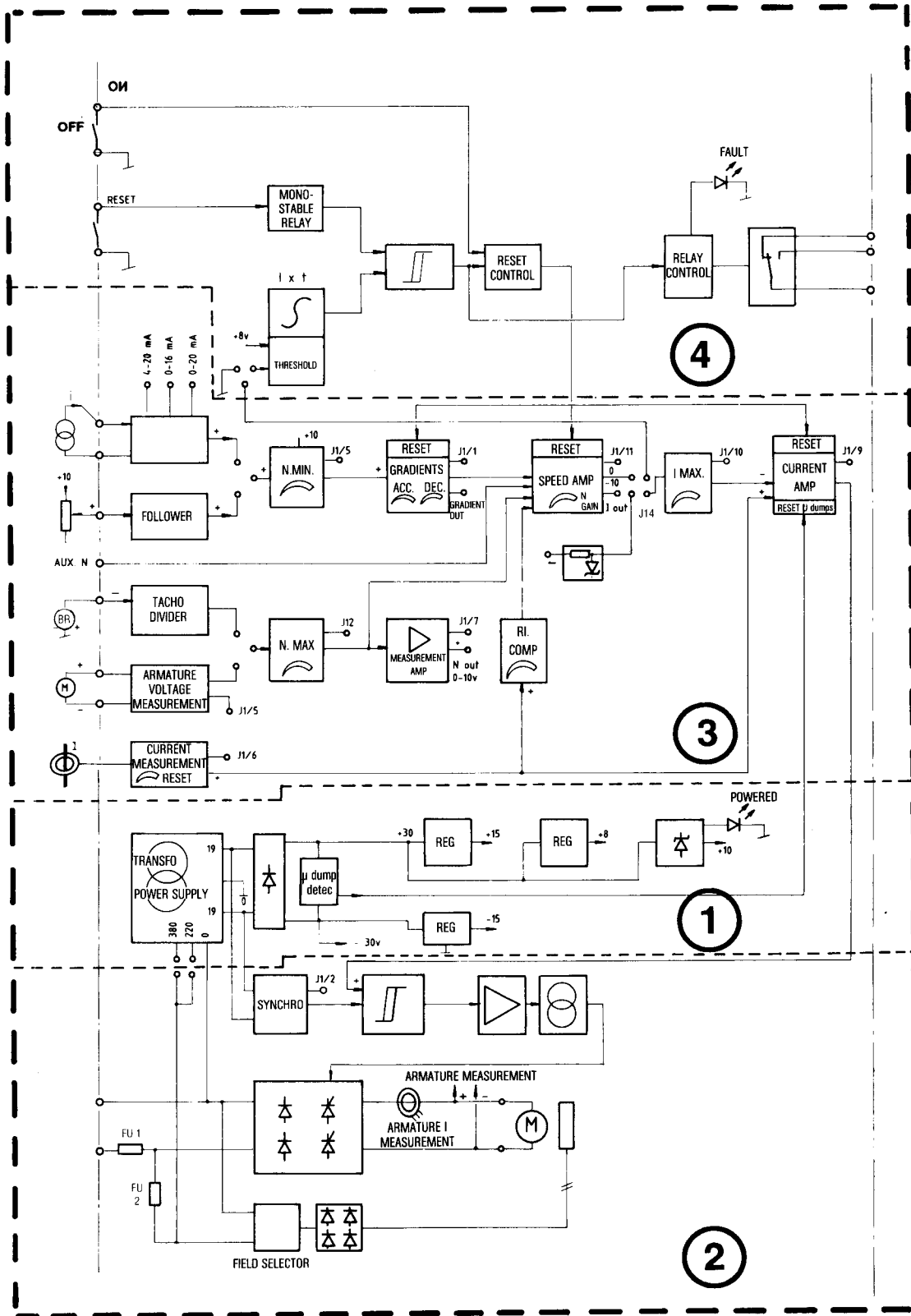
SAFETY UNLOCK : USES AN EXTERNALLY CONTROLLED MONOSTABLE RELAY (RESET)

FAULT ACKNOWLEDGE RELAY AND DISPLAY : IF AN OVERLOAD ON MOTOR CUTS IN THE I x T SAFETY

EXTERNAL CONTROLLER LOCK : ON/OFF CONTROL

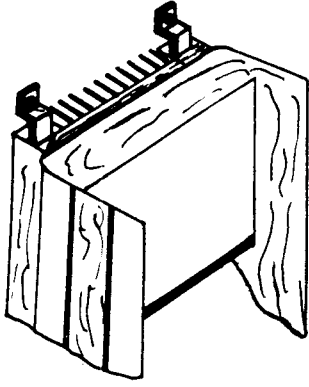
5 - CONTROLLER BLOCK DIAGRAM

FIG. 3



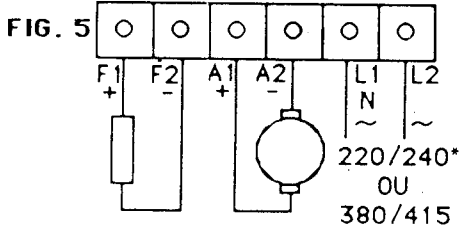
6 - INSTALLATION INSTRUCTIONS

FIG. 4

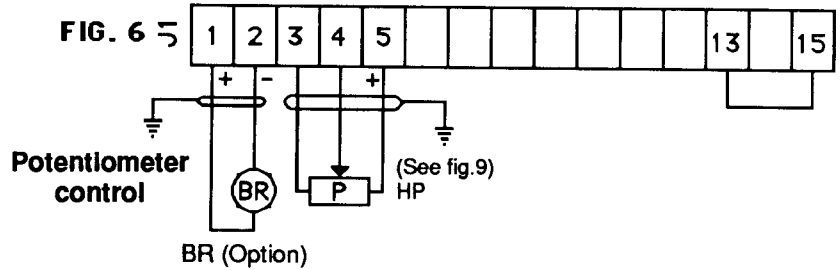


SLIDE THE FOUR SUPPORTING FEET INTO THE SLOTS ON THE EXTRUDED COOLER SECTION FORMING THE CASING AS SHOWN IN FIGURE 4.
ATTACH THE DEVICE USING FOUR 5 MM SCREWS, STARTING FROM THE BOTTOM.

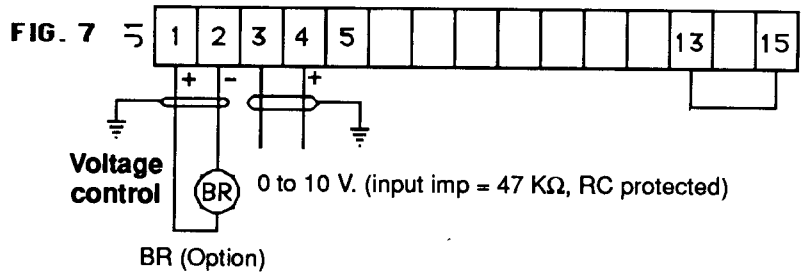
7 - CONNECTIONS FOR OPERATION AS A SPEED REGULATOR



* Check internal coupling



BR (Option)



BR (Option)

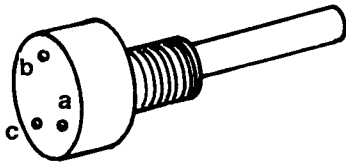
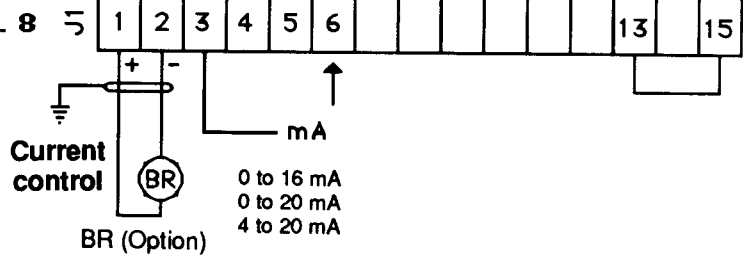
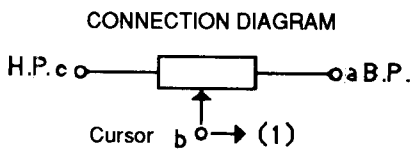


FIG. 9 2.2 KΩ POTENTIOMETER



BR (Option)

7-1 FOR CONNECTING POWER (SUPPLY TO CONTROLLER AND MOTOR ARMATURE): NOTE THE NOMINAL ARMATURE CURRENT VALUE ON THE MOTOR IDENTIFICATION PLATE AND MULTIPLY BY 1.5. DETERMINE THE GAUGE OF THE WIRING USED FROM THE RESULT AND LENGTH REQUIRED.

7-2 THE SPEED DISPLAY POTENTIOMETER (P) CABLES AND, IF APPLICABLE, THE TACHO GENERATOR (BR) CABLES MAY BE AFFECTED BY INTERFERENCE DUE TO INDUCTION. THE USE OF TWISTED WIRES OR, BETTER STILL, SHIELDED CABLES WITH ONE END OF THE BRAID GROUNDED IS THEREFORE RECOMMENDED. CABLE LENGTH SHOULD NOT EXCEED 20 METERS. IF LONGER CABLES ARE REQUIRED, USE CURRENT CONTROL OR VOLTAGE/CURRENT CONVERSION UNITS (EX: UNIT No 1278).

7-3 DO NOT GROUND OR MACHINE-GROUND ANY OF THE WIRES CONNECTED TO THE TERMINAL BLOCK.

7-4 USE A CONTACTOR OR CIRCUIT-BREAKER FOR SWITCHING THE DEVICE ON AND OFF.

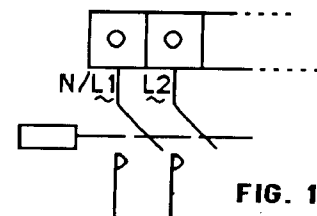
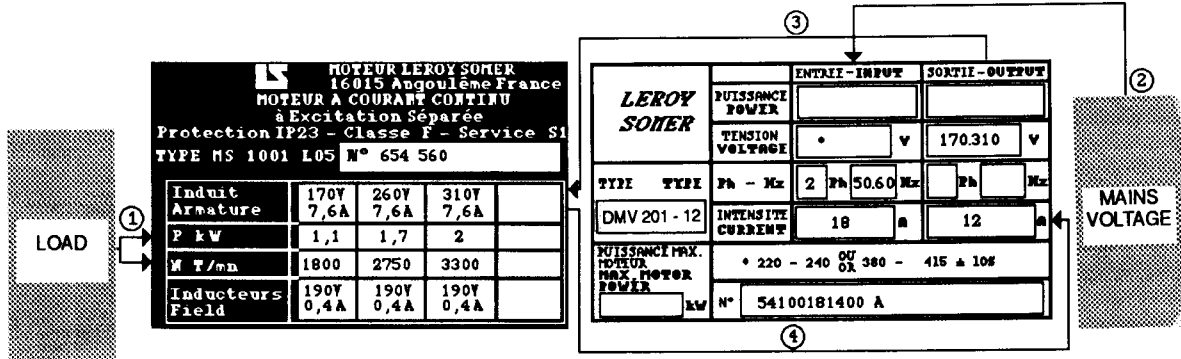


FIG. 10

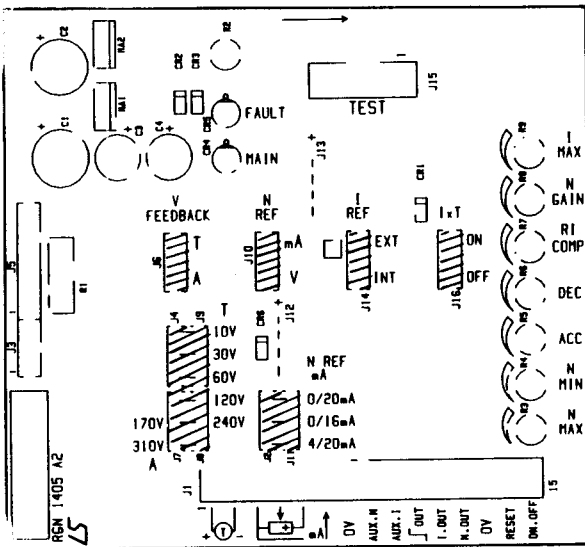
3 - CHECK BEFORE STARTING



8-1 MAKE CERTAIN THAT THE FOLLOWING VALUES MATCH UP: MAINS



8-2 LINKS POSITIONS



POSITIONS OF LINKS AND POTENTIOMETERS ON RGN 1405 A REGULATOR BOARD.

REFER TO PAGES 15, 16, 17 FOR LINKS POSITIONS ON POWER BOARD

REGULATOR BOARD		
LINKS	LOCATION	DESCRIPTION
J6		MOTOR WITHOUT TACHO GENERATOR (ALSO CONNECT J7 - J8)
J4 J9		MOTOR WITHOUT TACHO GENERATOR 170 V FOR E1 IN 220 V POSITION 310 V FOR E1 IN 380 V POSITION
J7 J8		
J6		MOTOR WITH TACHO GENERATOR (ALSO CONNECT J4 - J9 - J7 - J8)
J4 J9		LINK POSITION FROM 10V TO 240V DEPENDING ON TACHO GENERATOR VOLTAGE AND MAXIMUM MOTOR SPEED
J7 J8		
J10		VOLTAGE-CONTROLLED SPEED CURRENT-CONTROLLED SPEED (ALSO CONNECT J2 - J11)
J2 J11		LOCATION OF LINK DEPENDING ON CURRENT SOURCE (0-20mA OR 0-16mA OR 4-20 mA)
J14		LEAVE LINK IN POSITION I REF - INT
J16		LEAVE LINK IN POSITION I x T - ON

POWER BOARD		
LINKS	LOCATION	DESCRIPTION
E1		MAINS VOLTAGE 220/240V MAINS VOLTAGE 380/415V
E2		MOTOR FIELD VOLTAGE 100V FOR E1 ON 220V MOTOR FIELD VOLTAGE 170V FOR E1 ON 380V
		MOTOR FIELD VOLTAGE 190V FOR E1 = 220V MOTOR FIELD VOLTAGE 340V FOR E1 = 380V

9 - STARTING - ADJUSTMENT

9-1 SET THE SPEED REFERENCE TO ZERO AS FOLLOWS:

- TURN POTENTIOMETER P FULLY ANTI-CLOCKWISE (FIG 6)
- OR SET VOLTAGE CONTROL TO 0 VOLTS (FIG 7)
- OR SET CURRENT CONTROL TO 0 mA (FOR A 4 TO 20 mA CONTROL) (FIG 8).

9-2 MOTOR CONNECTIONS AS SHOWN IN FIGURE 5 ARE FOR CLOCKWISE ROTATION OF THE DRIVE SHAFT END. - FOR ANTICLOCKWISE ROTATION, CONNECTIONS F1 AND F2 SHOULD BE REVERSED.

9-3 FOR MOTORS EQUIPPED WITH A TACHO GENERATOR, TURN THE SHAFT MANUALLY IN THE DIRECTION CORRESPONDING TO THE TYPE OF CONNECTION PERFORMED. USE A VOLTMETER TO IDENTIFY THE POLES (+ AND -) OF THE TACHO GENERATOR AND CONNECT AS INDICATED IN PARAGRAPH 7 FIG. 6, FIG.7 AND FIG. 8.

9-4 POWER UP THE CONTROLLER. THE GREEN LED COMES ON.

9-5 TURN POTENTIOMETER P SLOWLY CLOCKWISE. THE MOTOR SHAFT SHOULD BEGIN TO TURN (PROVIDED THAT R9 I MAX IS NOT AT ZERO).

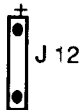
9-6 INCREASE ROTATION SPEED BY TURNING POTENTIOMETER P FULLY CLOCKWISE. IF NECESSARY, ADJUST **MAX SPEED** LIMIT USING INTERNAL POTENTIOMETER R3. **N. MAX**.

9-7 TURN POTENTIOMETER P BACK TO FULL ANTI-CLOCKWISE POSITION. IF NECESSARY, ADJUST **MIN SPEED** LIMIT USING INTERNAL POTENTIOMETER R4. **N. MIN**.

9-8 SETTING THE ACCELERATION GRADIENT TURN INTERNAL POTENTIOMETER R5 **ACC** CLOCKWISE. POTENTIOMETER **ACC** IS USED TO GIVE GRADUAL ACCELERATION TO THE MOTOR SHAFT FOR ABOUT 10 SECONDS WHEN THE SPEED SET-POINT IS SUDDENLY BROUGHT UP TO MAXIMUM VALUE (FIG. 6, FIG. 7 OR FIG. 8).

NOTE: A PIN SOCKET (J 12) IS PROVIDED ON THE REGULATION BOARD. TO INCREASE ACCELERATION TIME, INSTALL A CHEMICAL CAPACITOR WITH POLARITIES AS MARKED ON THE BOARD .

EXAMPLE: A 1 μ F (16 VOLT) CAPACITOR DOUBLES ACCELERATION TIME.



9-9 SETTING THE DECELERATION GRADIENT IN THE SAME WAY, DECELERATION CAN BE SLOWED DOWN BY ADJUSTING INTERNAL POTENTIOMETER R6 **DEC** WHEN SPEED IS SUDDENLY REDUCED (MAX TIME = ABOUT 10 SEC FROM MAX SPEED SETTING TO ZERO)

NOTE: EXCESSIVE INERTIA CAN CANCEL THE DECELERATION GRADIENT

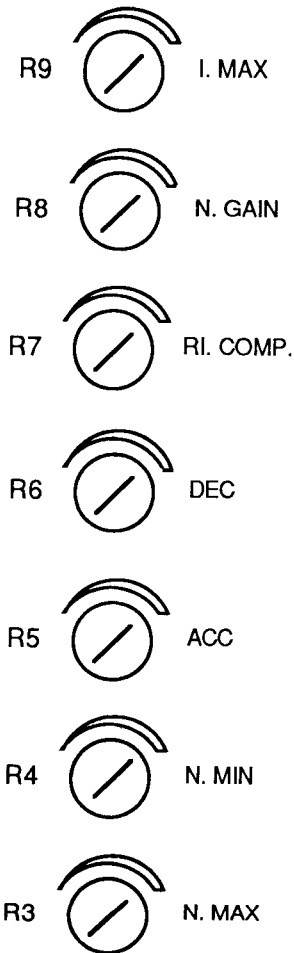


FIG. 12

9-10 ADJUSTING STABILITY

AFTER A SUDDEN CHANGE IN THE SPEED SET-POINT, THE ROTATING MOTOR SHAFT MUST STABILIZE RAPIDLY AT THE NEW VALUE. IF IT TAKES A LONG TIME TO STABILIZE, ADJUST INTERNAL POTENTIOMETER R8 **N.GAIN** UNTIL OPTIMUM SETTLING IS OBTAINED.

9-11 SETTING MAXIMUM PERMANENT CURRENT

INTERNAL POTENTIOMETER R9 **I.MAX** SETS THE MAXIMUM CURRENT SUPPORTED BY THE MOTOR WITHOUT DAMAGE.

- READ THE CONTROLLER CAPACITY
- READ THE NOMINAL MOTOR I (ON THE MOTOR ID PLATE)
- ADJUST POTENTIOMETER **I.MAX** (CORRESPONDING TO NOMINAL MOTOR I) AS SHOWN IN THE FIGURE BELOW.

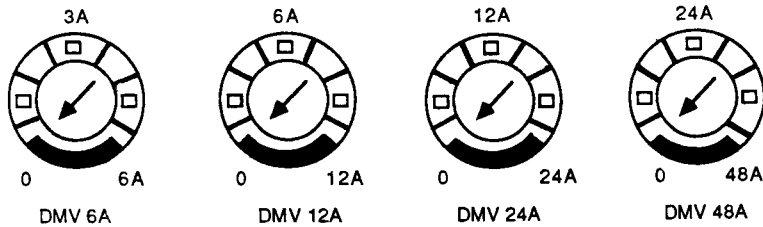


FIG. 13

9-12 SETTING $R \times I$ COMPENSATION (MOTOR NOT EQUIPPED WITH TACHO GENERATOR).

- ROTATE THE MOTOR (NO LOAD CONNECTED) AT MAX SPEED
- APPLY THE LOAD TO THE MOTOR
- SLOWLY TURN INTERNAL POTENTIOMETER R7 **RI.COMP** UNTIL THE MOTOR TURNS AT ROUGHLY THE SAME SPEED AS WHEN RUNNING WITHOUT THE LOAD.

10-SAFETY DEVICES

10-1 A PROTISTOR FUSE F1 PROTECTS THE POWER SUPPLY LINE FROM ANY SHORT-CIRCUITS OCCURING IN THE CONTROLLER POWER CIRCUIT OR IN THE MOTOR ARMATURE.

10-2 A FUSE F-2 PROTECTS THE LINE FROM ANY SHORT-CIRCUITS OCCURING IN THE MOTOR FIELD CIRCUIT OR ELECTRONICS BOARD.

10-3 AN ELECTRONIC SAFETY DEVICE LOCKS THE CONTROLLER (CUTS OUT THYRISTORS AND FREEWHEELS THE MOTOR) FOLLOWING AN EXTENDED OVERLOAD ($I \times T$ FUNCTION). EXAMPLE: IF OPERATING AT 1.5 IN, THE SAFETY DEVICE CUTS IN AFTER APPROX. 10 SECONDS).

10-3-1 THE CONTROLLER IS UNLOCKED BY CONNECTING TERMINALS 13 AND 14 (FIG. 14) ON THE REGULATOR BOARD BRIEFLY USING A NON-MAINTAINED CONTACT.

10-3-2 ELECTRONIC SAFETY DEVICE OPERATION:

- TRIPS A RELAY AND ROUTES ITS DE-ENERGIZED O/F CONTACTS (CAPACITY 2A - 220V AC) ARE TO TERMINALS NC - C - NO (FIG. 15) ON THE POWER BOARD.
- SWITCHES ON THE RED "FAULT" LED.

Controller	Fuse	
	F1	F2
DMV - 6A	25 A	3,15 A
DMV - 12A	25 A	3,15 A
DMV - 24A	50 A	3,15 A
DMV - 48A	100 A	3,15 A

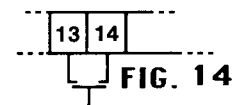
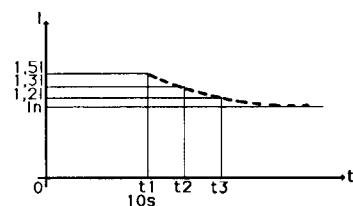


FIG. 14

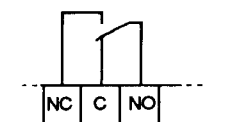
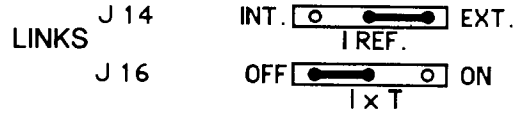
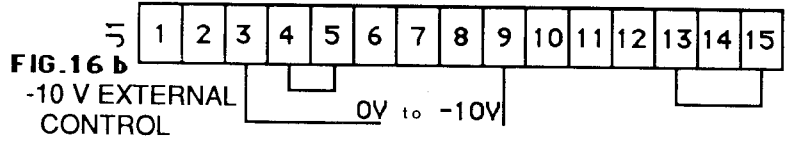
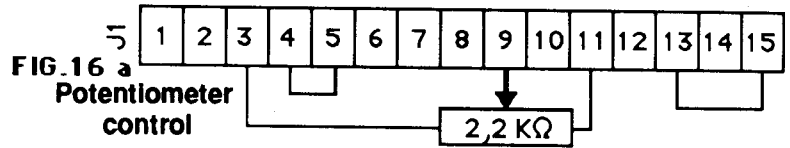


FIG. 15

11 - SPECIAL APPLICATIONS

11-1 OPERATION AS A TORQUE REGULATOR (AUX I) (ALSO SEE PARAGRAPH 11-5).

FOR THIS TYPE OF OPERATION, THE CONTROL SIGNAL IS SENT TO THE CURRENT AMPLIFIER INPUT. THIS IS USED TO REGULATE THE CONTROLLER OUTPUT CURRENT (MOTOR ARMATURE CURRENT), WHATEVER THE SPEED OF THE MOTOR. THE NECESSARY PRECAUTIONS MUST BE TAKEN SINCE MOTOR SPEED QUICKLY RISES TO MAXIMUM (OPEN LOOP) IF THE LOAD MOMENT DECREASES (LOAD SHEDDING) AT ANY GIVEN SET-POINT.



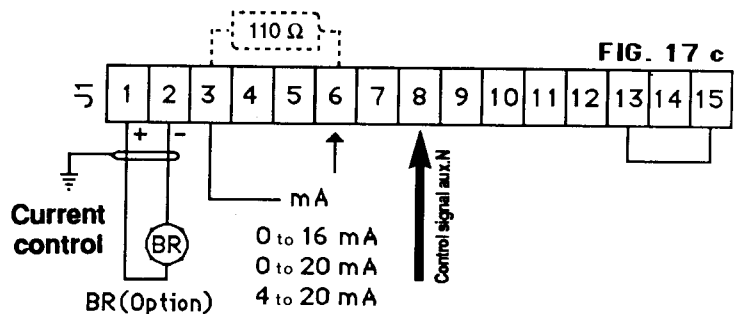
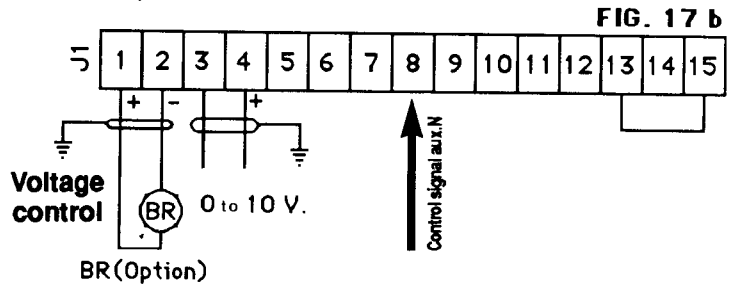
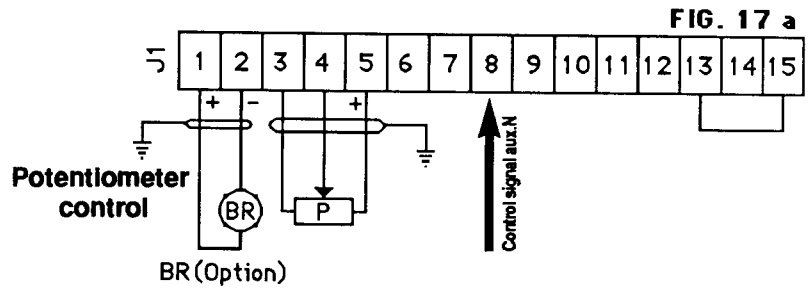
POTENTIOMETERS
ONLY POTENTIOMETER R9 (I MAX) IS OPERATIVE
ADJUST AS IN PARAGRAPH 9-11.

11-2 USE OF THE AUXILIARY SPEED INPUT (AUX N)

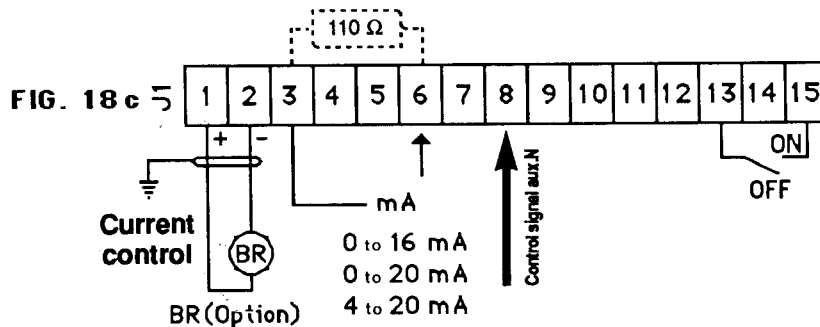
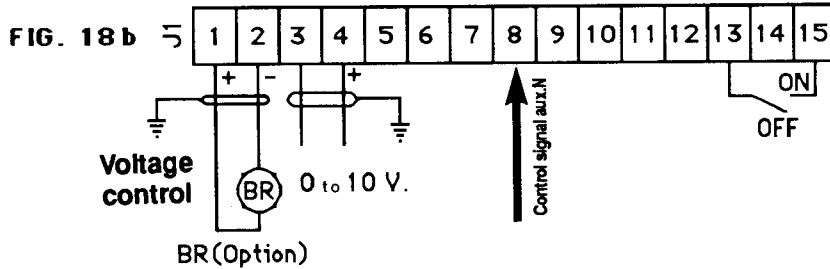
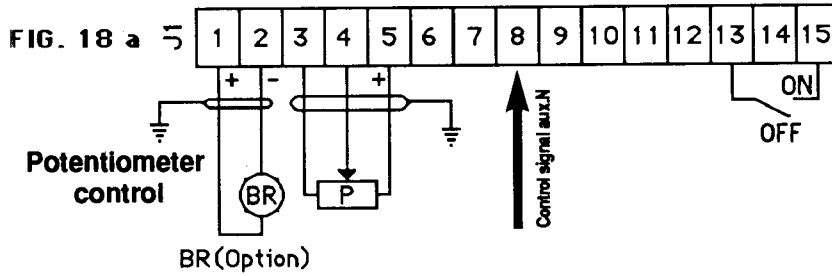
A SIGNAL (APPLIED TO TERMINAL 8) BETWEEN 0 AND SEVERAL VOLTS CAN BE SUPERIMPOSED OVER THE MAIN SIGNAL (REFERENCE). THE SUM OF BOTH SIGNALS MUST BE 10 VOLT MAX.

EXAMPLE: A SIGNAL FROM AN AUTOMATON TO BE SUPERIMPOSED ON THE LINE SPEED CONTROL SIGNAL.

NOTE: THE SIGNAL APPLIED TO TERMINAL 8 CAN BE POSITIVE OR NEGATIVE. IT WILL BE ADDED OR SUBTRACTED FROM THE MAIN SIGNAL.



11-3 CONTROLLING THE CONTROLLER USING AN ON-OFF SWITCH



WHILE THE CONTROLLER IS POWERED, MAKING THE CONNECTION BETWEEN 13 AND 15 UNLOCKS THE SAFETY THUS CAUSING THE MOTOR TO ROTATE IF A CONTROL SIGNAL IS APPLIED TO THE CONTROLLER INPUT. THE MOTOR STARTS ROTATING AT THE GRADIENT SET USING POTENTIOMETER R5. ACC. THE CONTROLLER LOCKS IF THIS CONNECTION IS BROKEN AND THE MOTOR FREEWHEELS.

IMPORTANT:

WHILE THE CONTROLLER IS POWERED, A HALT CAUSED BY BREAKING THE CONNECTION BETWEEN 13 AND 15 MUST BE CONSIDERED AS A SEQUENCE HALT. THE CONTROLLER OR ENTIRE INSTALLATION MUST BE DE-ENERGIZED BEFORE ANY REPAIR WORK ON EITHER THE ELECTRICAL OR MECHANICAL SECTIONS CAN BE CARRIED OUT.

11-4 USE OF GRADIENT OUTPUT ∇ OUT

THE GRADIENT OUTPUT IS EXTREMELY USEFUL WHEN A NUMBER OF MOTOR CONTROLLERS ARE TO BE CONTROLLED BY THE SAME CONTROL SIGNAL (VOLTAGE OR CURRENT) TO PRODUCE THE SAME GRADIENT. ONE OF THE CONTROLLERS IS CHOSEN TO ACT AS "MASTER" (IT RECEIVES THE CONTROL SIGNAL AND PRODUCES A SET GRADIENT). THE OTHERS ARE "SLAVES".

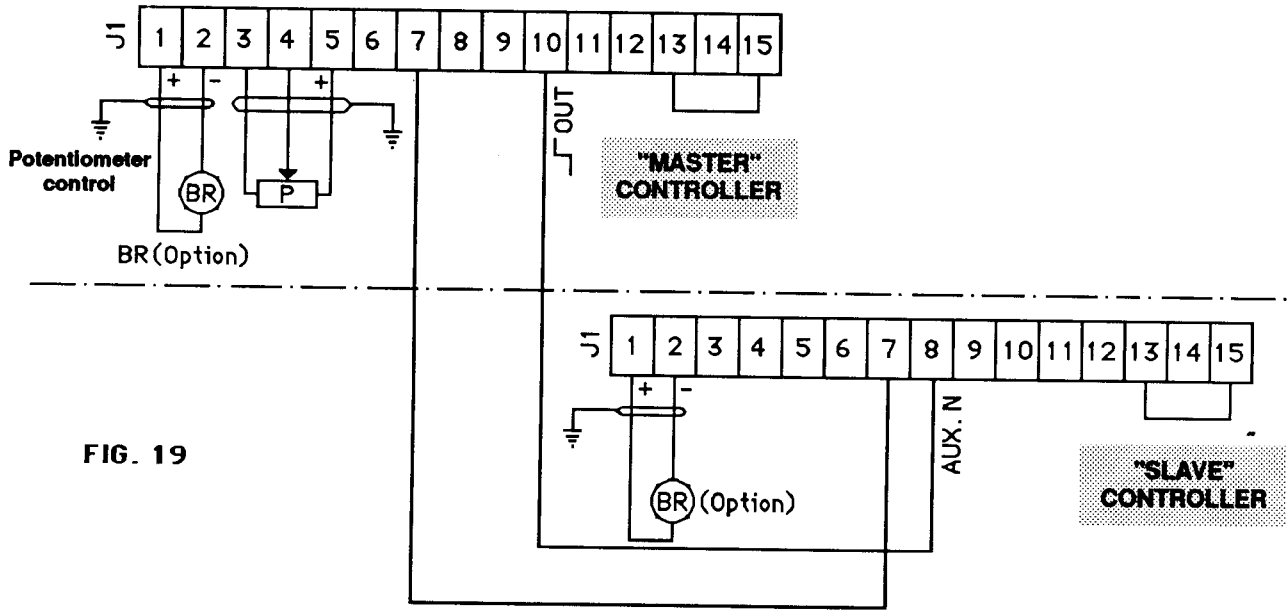


FIG. 19

THE GRADIENT SIGNAL OUTPUT FROM THE "MASTER" CONTROLLER IS SENT TO THE AUXILIARY SPEED INPUT OF THE "SLAVE" CONTROLLER.

11-5 USE OF SPEED OUTPUT I.OUT

THIS OUTPUT CAN BE USED WHEN SEVERAL MOTORS (EACH POWERED BY A CONTROLLER) ARE MECHANICALLY LINKED. A "MASTER" CONTROLLER IS CHOSEN. SPEED DATA IS OUTPUT FROM TERMINAL 11 (I.OUT) ON THIS CONTROLLER AND IS THEN SENT TO TERMINAL 9 (AUX. I) OF THE "SLAVE" CONTROLLERS. LINK J14 MUST HAVE PREVIOUSLY BEEN INSTALLED IN POSITION I. EXT ON "SLAVE" CONTROLLERS.

INT. EXT.

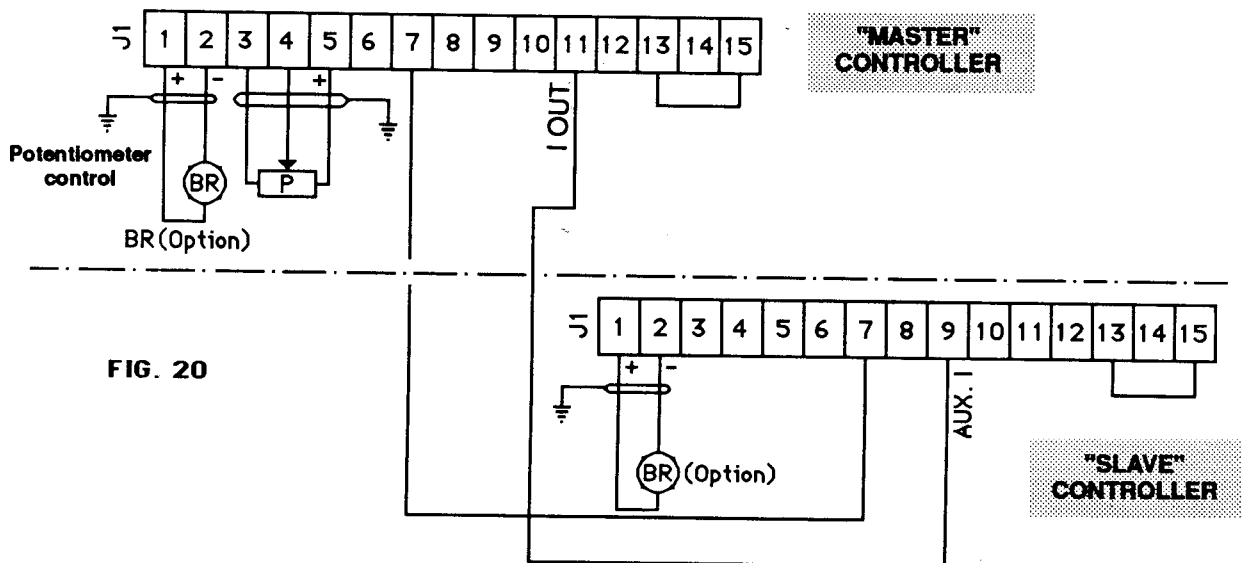
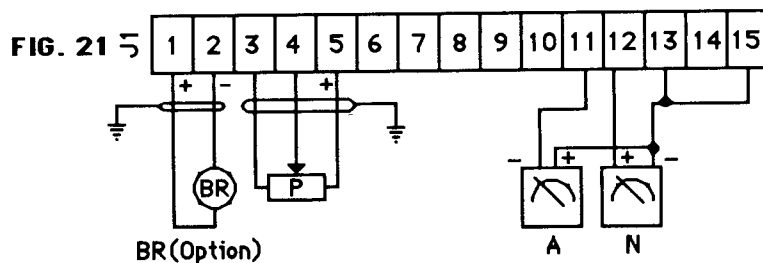


FIG. 20

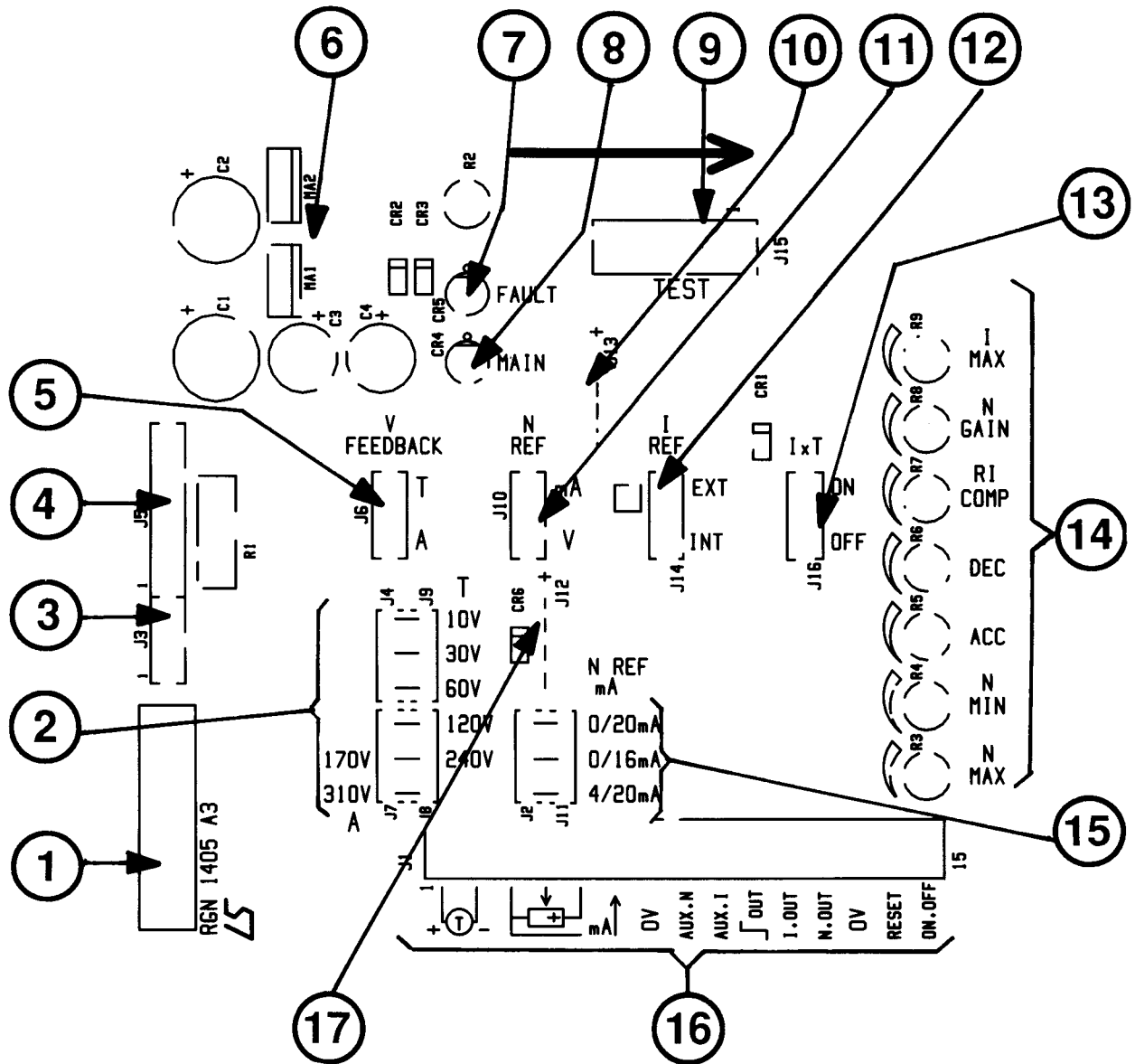
11-6 USE OF SPEED OUTPUT N. OUT

OUTPUT **N. OUT** CAN ALSO BE USED TO OBTAIN AN IMAGE OF MOTOR SPEED IN PROPORTION TO A SIGNAL VARYING BETWEEN 0 AND 10 V. OR TO FEED A MEASURING INSTRUMENT (INTERNAL R. OF THE DEVICE > 1000 OHM / VOLT).

OUTPUT **I. OUT** CAN ALSO BE USED TO OBTAIN AN IMAGE OF CURRENT AT THE CONTROLLER OUTPUT (MOTOR ARMATURE CURRENT) IN PROPORTION TO A SIGNAL VARYING BETWEEN 0 AND 10 V. OR TO FEED A MEASURING INSTRUMENT (INTERNAL R. OF THE DEVICE > 1000 OHM / VOLT).

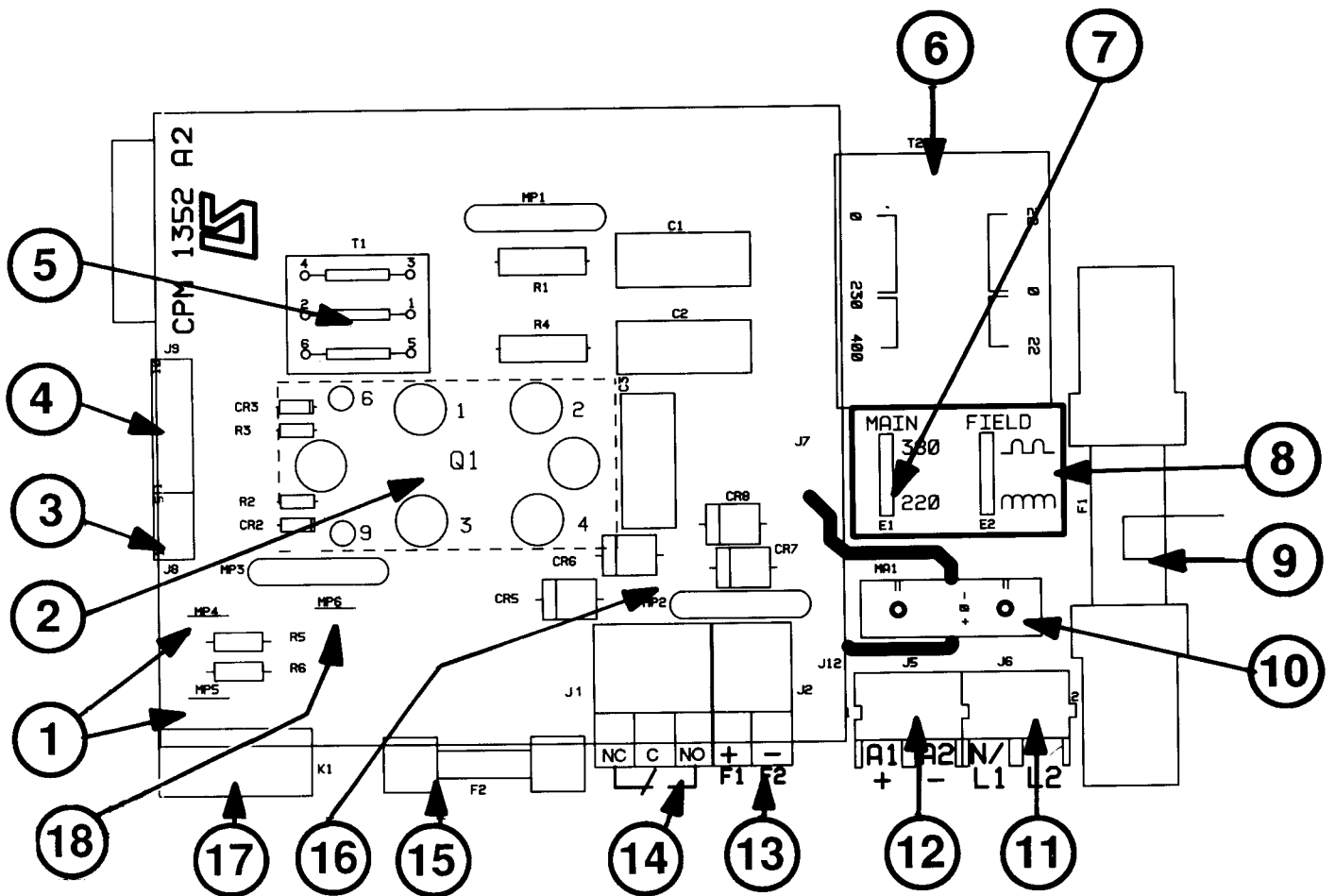


12 - LAYOUT
12-1 REGULATOR BOARD



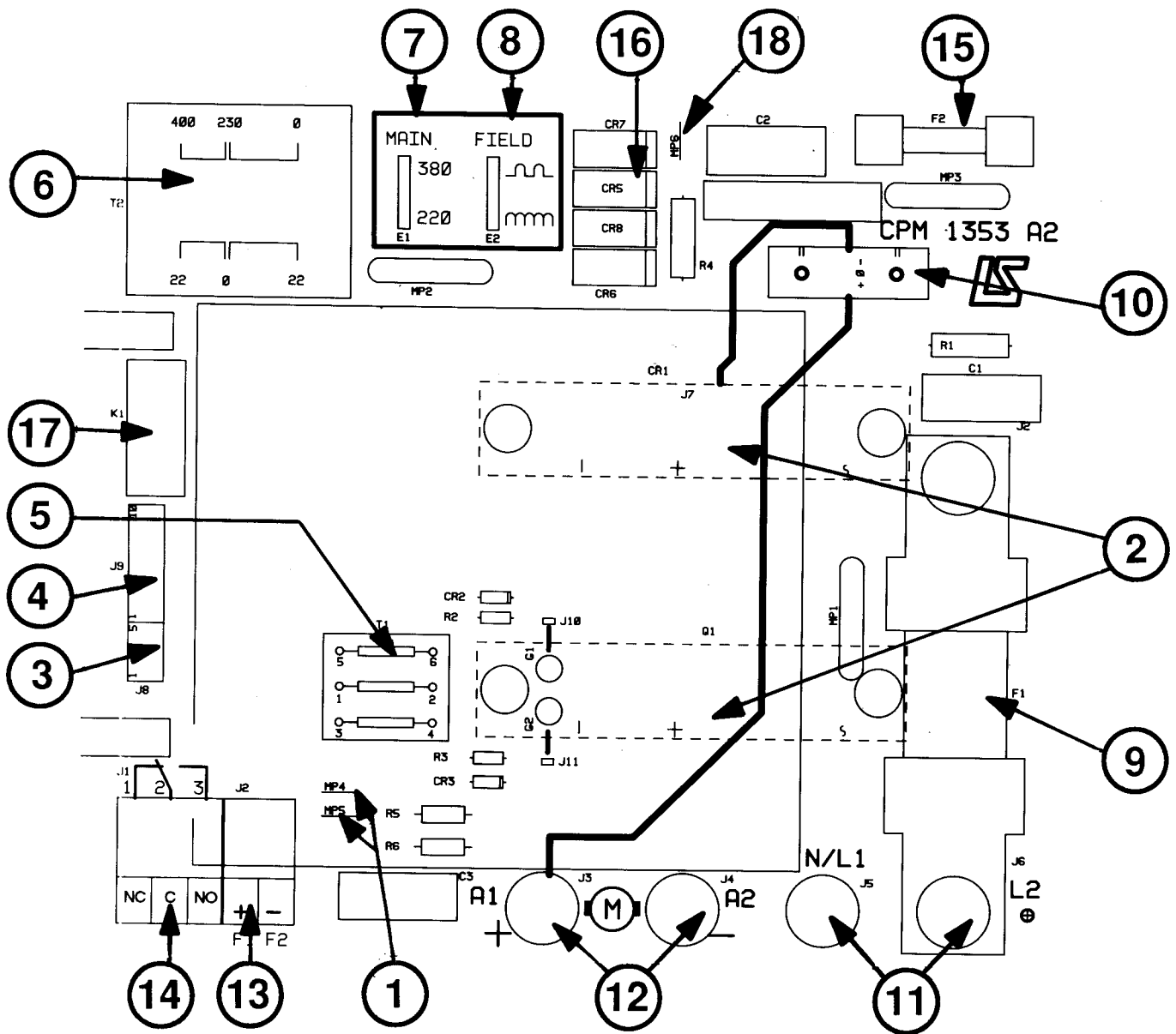
REGULATOR BOARD LAYOUT

1	IDENTIFICATION LABEL	10	SPEED AMP DYNAMIC GAIN CAPACITOR
2	TACHO GENERATOR IMAGE VOLTAGE OR ARMATURE VOLTAGE SELECTOR SWITCH	11	SPEED CONTROL SIGNAL SELECTOR: CURRENT OR VOLTAGE
3	INTERFACE CONNECTOR	12	CURRENT CONTROL SIGNAL SELECTOR (INTERNAL OR EXTERNAL)
4	INTERFACE CONNECTOR	13	IxT PROTECTION ON/OFF SELECTOR
5	REGULATION SELECTOR: EITHER TACHO GENERATOR OR ARMATURE VOLTAGE FEEDBACK	14	ADJUSTMENT POTENTIOMETERS
6	+ 15V, - 15V POWER SUPPLY TO ELECTRONICS	15	CURRENT CONTROL SIGNAL LEVEL SELECTOR
7	RED FAULT INDICATOR LIGHT (IxT SAFETY)	16	LOW SIGNAL TERMINAL BLOCK
8	GREEN MAINS POWER ON INDICATOR	17	CAPACITOR FOR INCREASING GRADIENT TIME (T > 10s)
9	TEST PLUG		



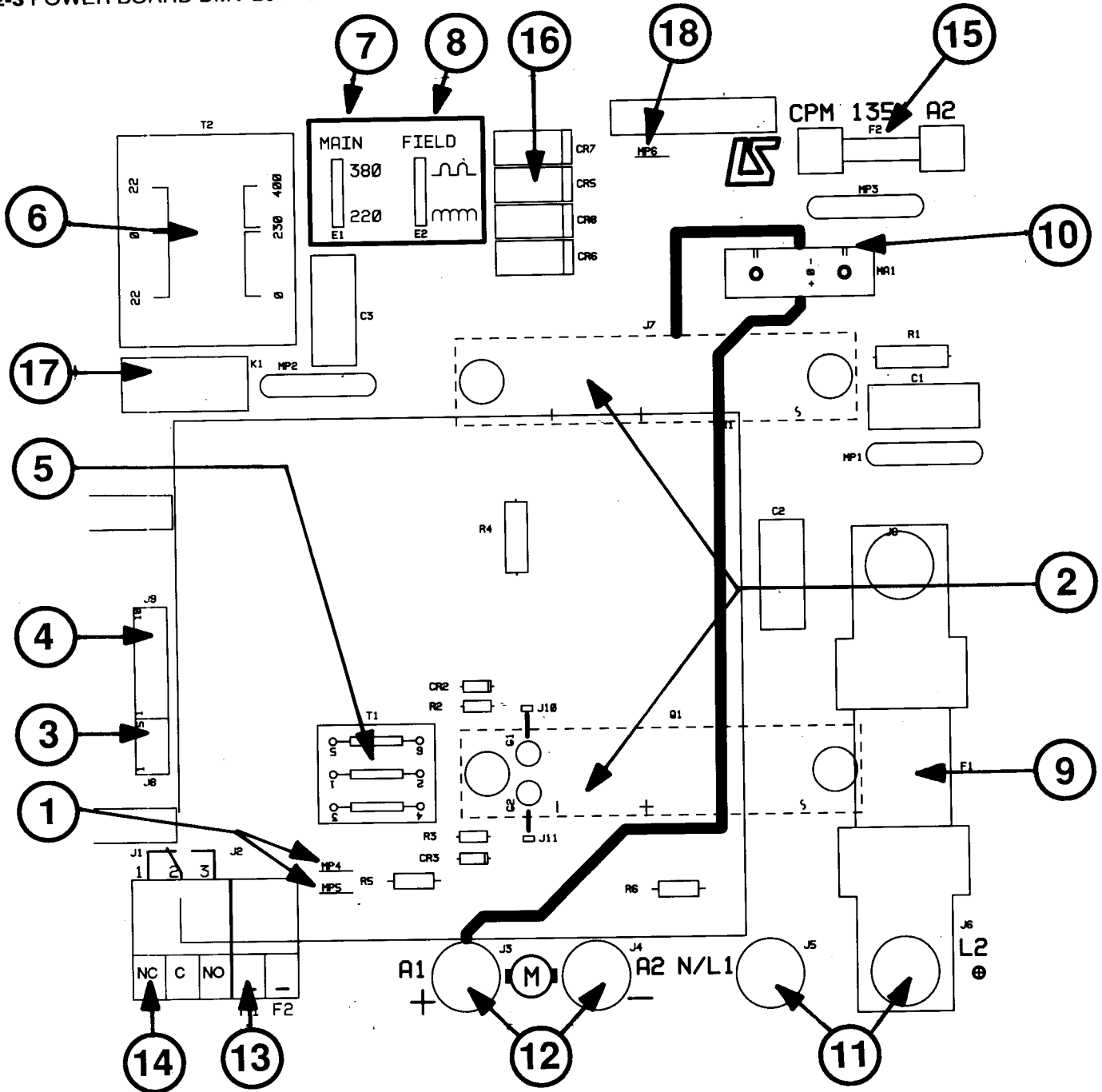
POWER CARD LAYOUT

1	GALVANIC INSULATION STRAP (TACHO GENERATOR SPEED READOUT)	10	ARMATURE CURRENT SIGNAL SENSOR
2	MIXED SINGLE-PHASE POWER BRIDGE	11	MAINS IN CONNECTOR
3	INTERFACE CONNECTOR	12	MOTOR ARMATURE CONNECTOR
4	INTERFACE CONNECTOR	13	MOTOR FIELD CONNECTOR
5	THYRISTOR CONTROL PULSE TRANSFORMER	14	FAULT RELAY ON/OFF CONTACT CONNECTOR
6	ELECTRONICS POWER SUPPLY TRANSFORMER	15	FIELD BRIDGE AND POWER SUPPLY TRANSFORMER FUSE
7	MAINS POWER SELECTOR	16	FIELD BRIDGE
8	FIELD VOLTAGE SELECTOR	17	FAULT RELAY
9	POWER BRIDGE FUSE	18	FIELD BRIDGE POWER SUPPLY CUT-OFF STRAP



POWER CARD LAYOUT

1	GALVANIC INSULATION STRAP (TACHO GENERATOR SPEED READOUT)	10	ARMATURE CURRENT SIGNAL SENSOR
2	MIXED SINGLE-PHASE POWER BRIDGE	11	MAINS IN CONNECTOR
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7	MAINS POWER SELECTOR	16	FIELD BRIDGE
8	FIELD VOLTAGE SELECTOR	17	FAULT RELAY
9	POWER BRIDGE FUSE	18	FIELD BRIDGE POWER SUPPLY CUT-OFF STRAP



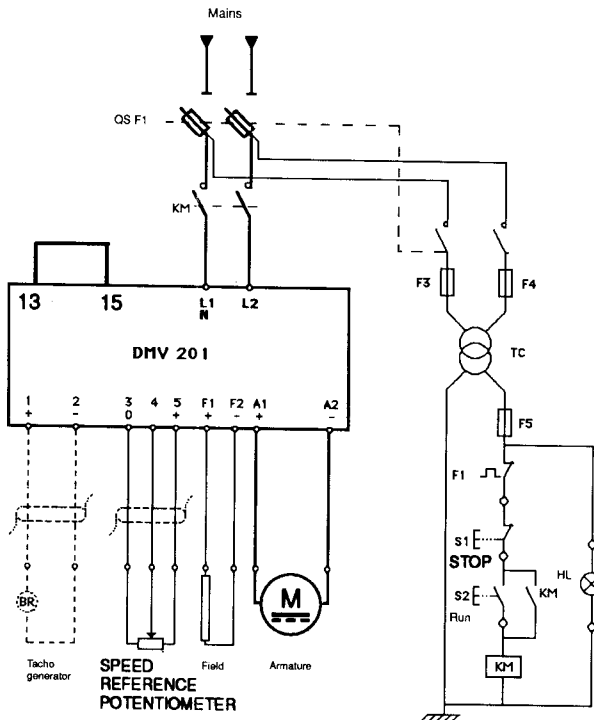
POWER CARD LAYOUT

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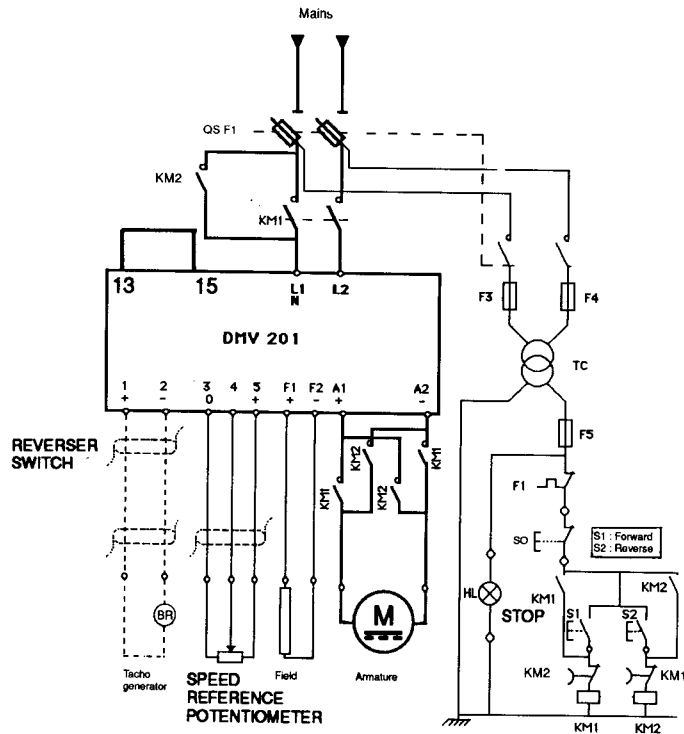
13- STANDARD FUNCTIONAL DIAGRAMS

THESE DIAGRAMS ARE FOR YOUR INFORMATION ONLY. THEY DO NOT ENGAGE THE RESPONSIBILITY OF LEROY-SOMER.

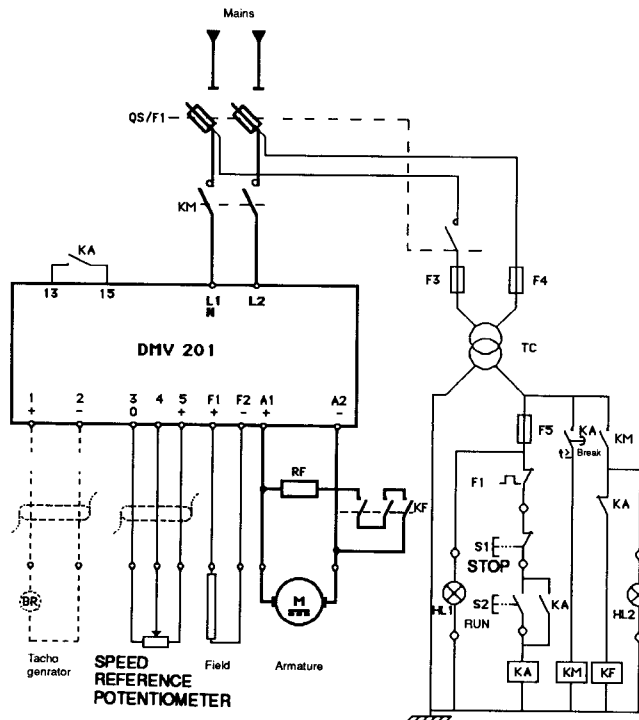
UNIDIRECTIONAL MOTOR FIG. 22



TWO-DIRECTION MOTOR FIG. 23



UNIDIRECTIONAL WITH BRAKING. FIG. 24



HL1 : mains ON
HL2 : motor RUNNING

14 - OTHER CAPABILITIES OF THE CONTROLLER DMV 201.

THE CONTROLLER DMV 201 IS DESIGNED TO SATISFY A WIDE RANGE OF REQUIREMENTS. IT HAS AUXILIARY INPUTS/OUTPUTS FOR RUNNING MOTORS ON VARIOUS PARAMETERS SUCH AS COMPLEMENTARY ANALOG VOLTAGE CORRECTION (AUTOMATES, SENSORS ETC.) OR CURRENT-CONTROLLED (TORQUE DISPLAY, SEVERAL MOTOR-CONTROLLERS CAN BE SLAVED). OPERATION BY PROGRAMMABLE AUTOMATES IS FACILITATED BY ITS CAPACITY TO BE EITHER VOLTAGE OR CURRENT-CONTROLLED, LOCKED (AND UNLOCKED) BY A SIMPLE CONTACT AND THE FACT THAT SAFETY IN/OUTS ARE AVAILABLE AT TERMINALS.

A DIAGNOSTIC UNIT CONNECTED DIRECTLY (TEST CONNECTOR) TO THE DEVICE (AVAILABLE AS AN OPTION) MAKES FOR VERY EASY ADJUSTMENT AND THOROUGH DIAGNOSTICS.

LIST OF TESTS RUN FROM THE DIAGNOSTIC UNIT

ADRESS	CONTROLLER CONNECTOR PIN NUMBER	FUNCTION	VALUE $\pm 5\%$
1	15	PRE-RAMP REFERENCE	0 TO +10 V (CONTROL)
2	13	CURRENT SENSOR	+ 8V
3	11	SPEED AMPLIFIER OUTPUT	0 TO -10V FOR SETTING 1,5 In
4	9	CURRENT AMPLIFIER OUTPUT	- 0,6V STOP MOTOR – POSITIVE : RUN MOTOR
5	7	SPEED IMAGE (0 - 10V)	0 TO +10V FOR SETTING N MAX
6	5	E.M.F. FEEDBACK IMAGE	- 8V TO - 9V FOR 170V OR 310 V
7	3	-15V INTERNAL POWER SUPPLY	- 15V
8	1	RAMP OUTPUT	0 TO +10 V (INTEGRATION CONTROL)
9	2	SAW - TOOTH	- 9V
10	4	+15V INTERNAL POWER SUPPLY	+ 15V
11	6	CURRENT IMAGE	+3 V TO +4V FOR CONTROLLER RATING 1,5 In +0,1V FOR I = 0
12	8	0V	0V
13	10	CURRENT DISPLAY	0 TO - 5V FOR CONTROLLER RATING In
14	12	TACHO GENERATOR FEEDBACK IMAGE	- 3V BY 1000 MIN ⁻¹ (T.G. 60V 1000 MIN ⁻¹)
15	14	LOCKING SYSTEM	INTERLOCK = 0V. UNLOCK = - 19 TO - 20V*
16	16	AUXILIARY CURRENT INPUT	0 TO -10V FOR SETTING 1,5 In - 0 V IF NO USED

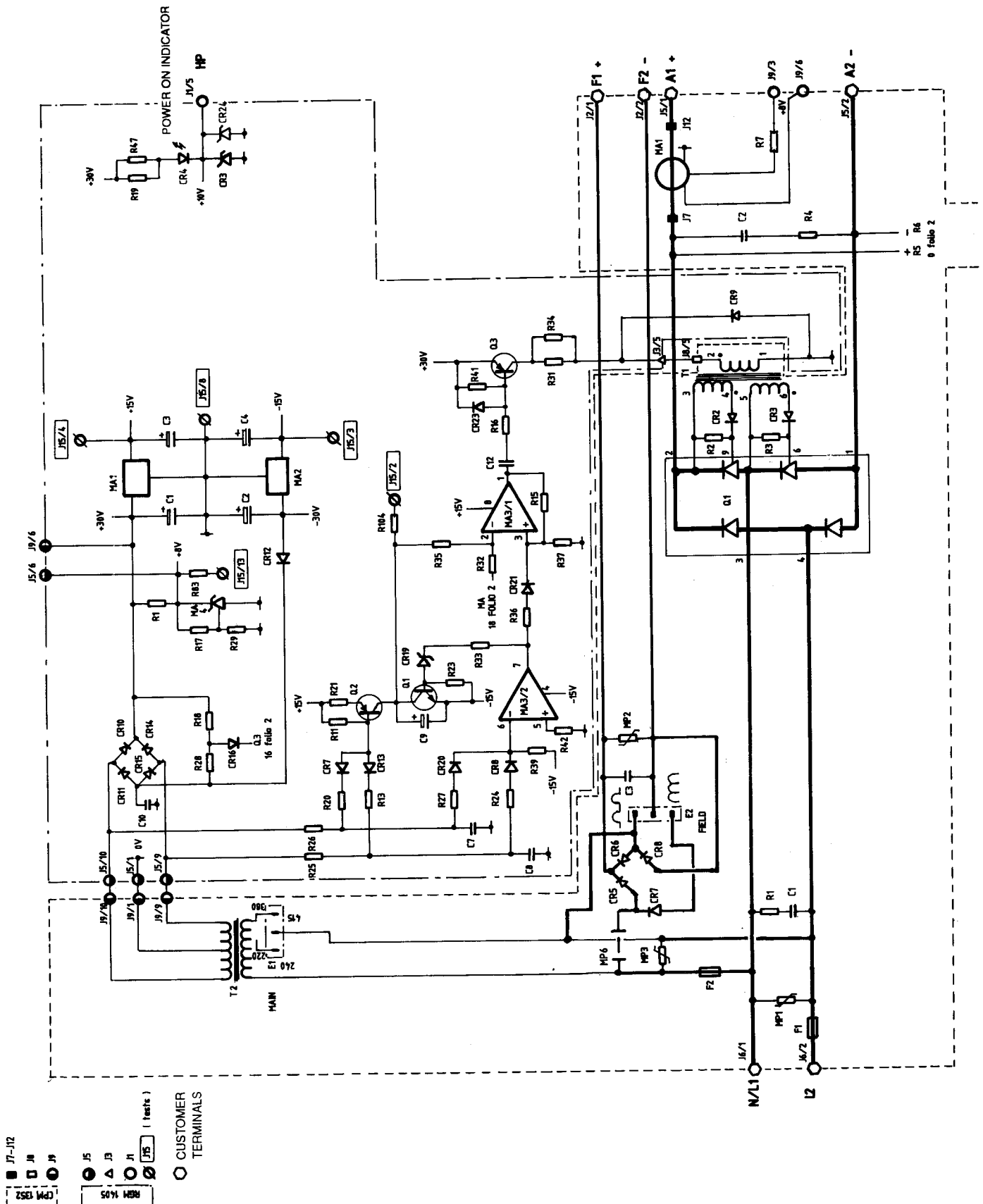
* - 20 V équivalent display -1

15- LIST OF MAIN PARTS

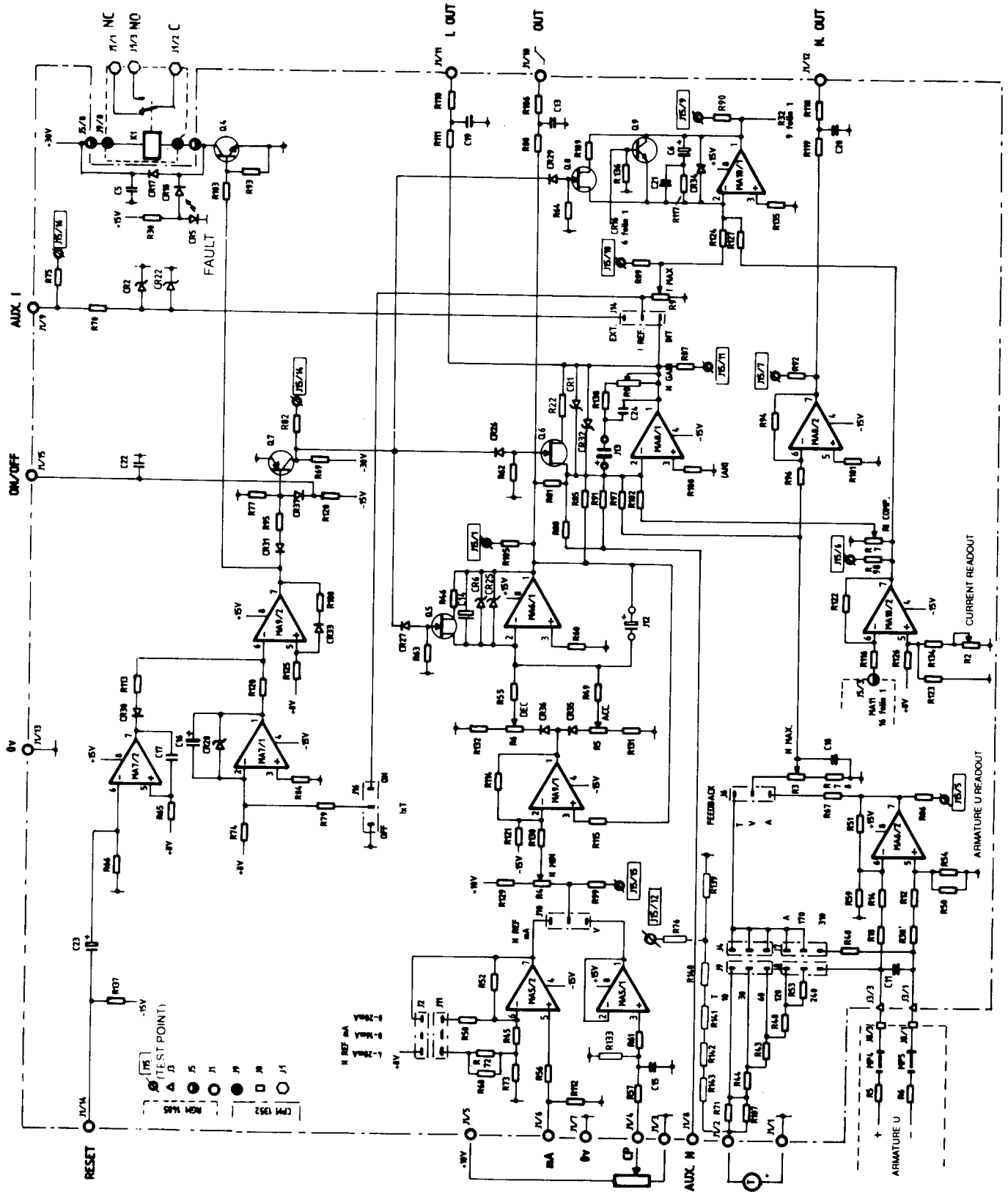
DESCRIPTION	REFERENCES	RATING				CODE	QUANTITY
		6	12	24	48		
BOARDS	CPM 1352	X	X			PEF 352 CB 000	1
	CPM 1353			X		PEF 353 CB 000	1
	CPM 1354				X	PEF 354 CB 000	1
	CPM 1405	X	X	X	X	PEF 405 CB 000	1
POWER BRIDGE UNIT	SKBZ 28/14	X	X			ESC 028 MM 000	1
THYRISTORS	SKKT 41/14			X		ESC 040 MT 002	1
	SKKT 91/14				X	ESC 091 MT 000	1
DIODES	SKKD 46/14			X		ESC 045 MD 002	1
	SKKD 81/14				X	ESC 080 MD 005	1
UR PROTISTOR CARTRIDGE	14 x 51 - UR 25	X	X			PEL 025 FU 000	1
	22 x 58 - UR 50			X		PEL 050 FU 001	1
	22 x 58 - UR 100				X	PEL 100 FU 000	1
UR FUSE	6 x 32 - UR 3,15 A	X	X	X	X	PEL 003 FU 001	1
FIELD DIODES	SKEA 1/17	X	X			ESC 001 DS 005	4
	SKEA 2,5/17			X	X	ESC 002 DS 001	4
POTENTIOMETER	2,2 Koms PE 30	X	X	X	X	POT 002 NK 001	1
KNOB	Ø 23	X	X	X	X	POT 023 AV 000	1
DIAL	Ø 50 0 à 300°	X	X	X	X	POT 050 AV 000	1
TRANSFORMER	FT 866 A	X	X	X	X	TRF 005 CI 003	1
	92 ACSL - A2 CE	X	X			MES 092 CA 000	1
CURRENT LIMITE	200 ACSL - A2 DH			X		MES 235 CA 000	1
	400 ACSL - A2 DK				X	MES 400 CA 000	1

16 - CIRCUIT DIAGRAM

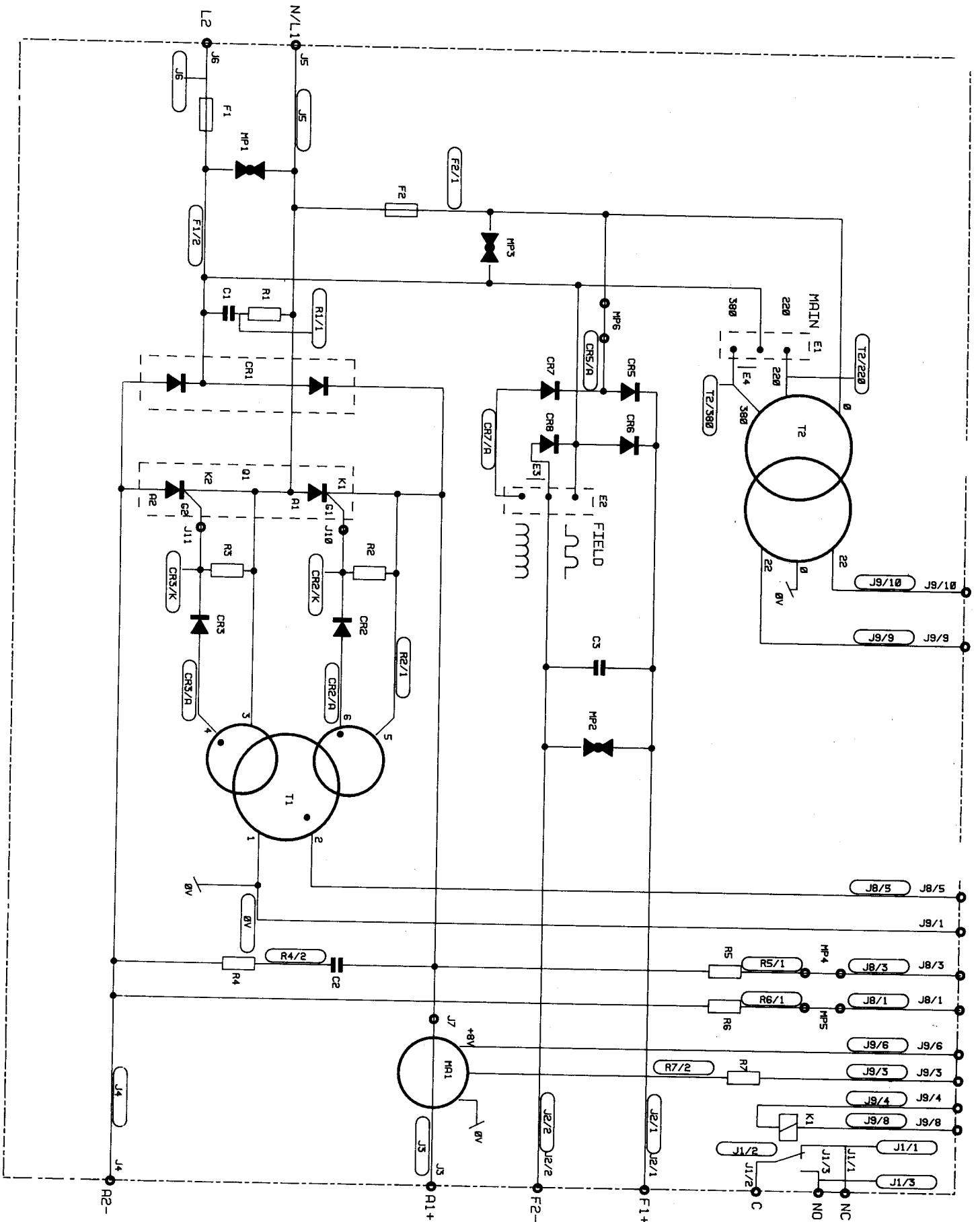
16-1 GENERAL POWER SUPPLY LAYOUT - POWER AND MOTOR CONTROL



16-2 GENERAL REGULATOR LAYOUT



16-4 24 - 48 A POWER BOARD LAYOUT



NOTES



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