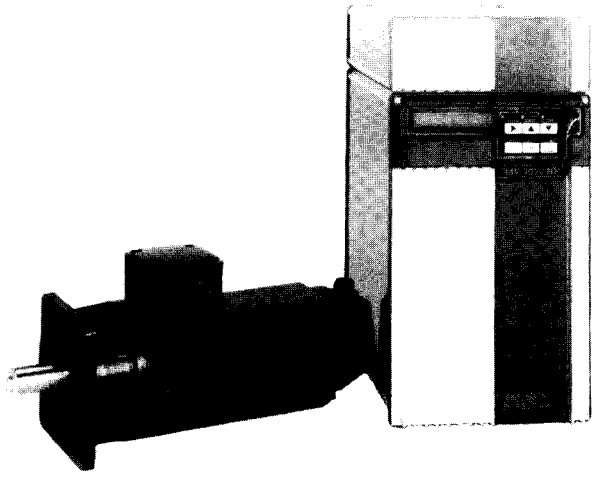
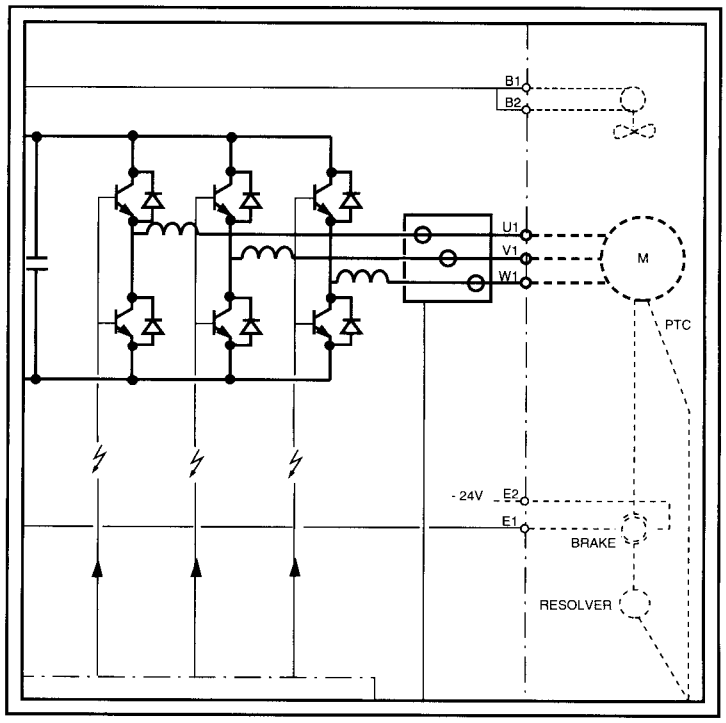
LEROY SOMER®





Réf. 1030 - O33 / a - 9.91

SMV-N and SMV-NP

Autosynchronous servomotor drive system

Installation and maintenance

NOTE

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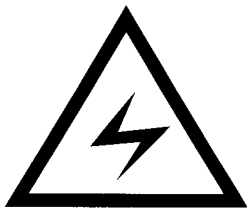
SMV-N and SMV-NP Autosynchronous servomotor drive system



IMPORTANT
DANGER

INSTRUCTIONS FOR USE

- For the user's safety, the converter must be connected to earth (terminal ⏚) via a differential relay of 15 mA.

- Do not touch the converter before the filtering capacitor is discharged : wait for 5 minutes after switching off the supply.

- Although this equipment complies with current standards, it may be necessary for the user to provide some means to eliminate any electrical interference caused.

IN GENERAL, THE MODULATOR *MUST BE SWITCHED OFF* ***BEFORE ANY SERVICE OR WORK IS CARRIED OUT ON THE ELECTRICAL OR MECHANICAL PARTS OF THE INSTALLATION.***

INTRODUCTION

This instruction manual describes the commissioning of the SMV-N and SMV-NP autosynchronous servomotor drive systems.

It describes all the procedures to be carried out when servicing the converter.

In particular, it covers in detail the programming and wiring of the controller.

An SMV system includes :

- an autosynchronous motor with permanent magnet rotor and a three-phase wound stator.
- an SMV-N or SMV-NP type converter.
  - SMV - N : Digital controller
  - SMV - NP : Digital controller with built-in POSITIONING extension board

The first part of this instruction notice describes the SMV-N type converter. This type of converter is designed to control an autosynchronous motor from a desired reference signal :

- either by speed signal
- or by torque signal

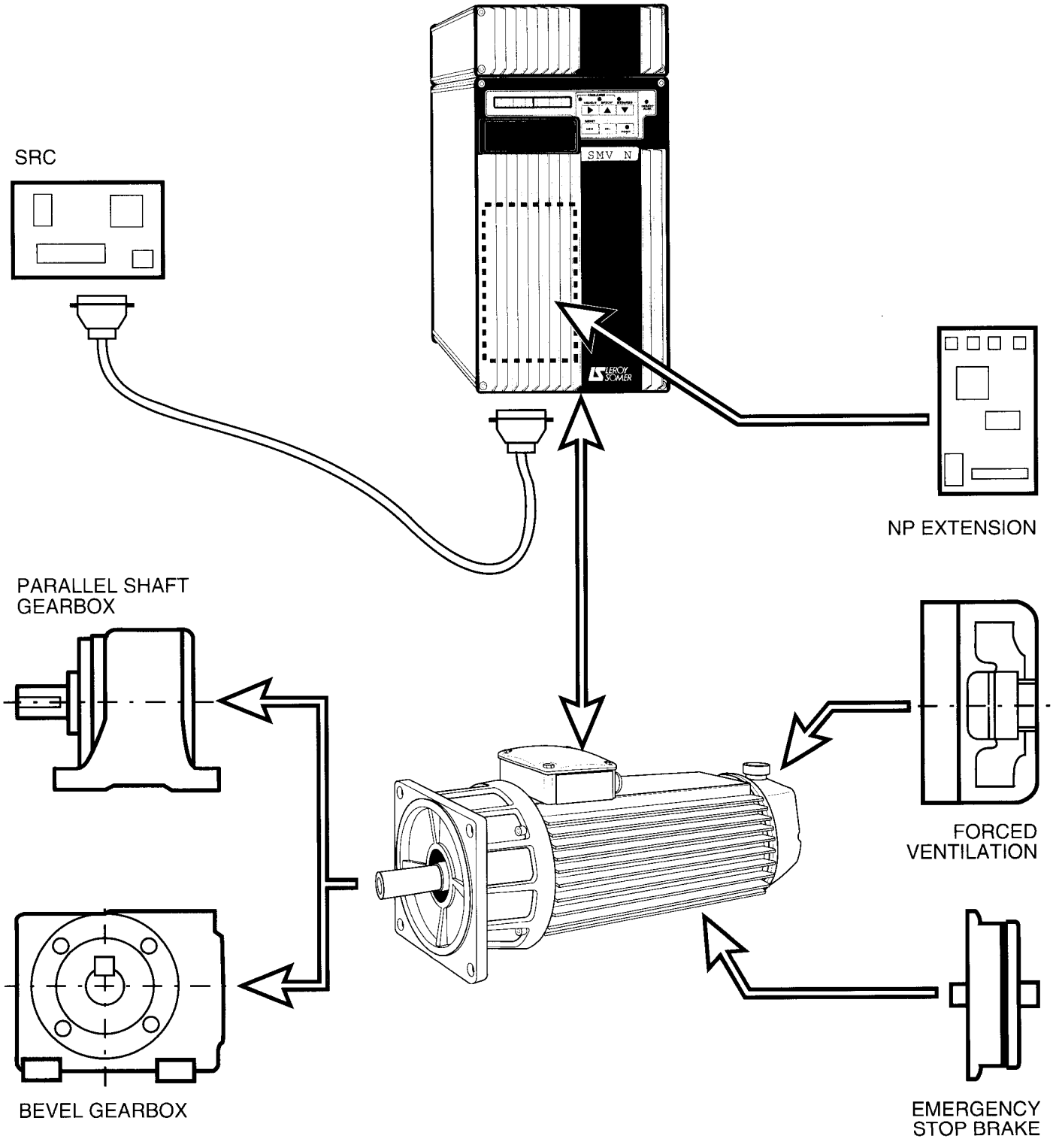
} via ± 10 V

You will also find a description of the SRC board : an extension ensuring the conversion of resolver signals from the motor into signals equivalent to those generated by an incremental encoder.

The first part also applies to the NP type, without describing the specific functions of the POSITIONING extension.

These functions are described in the second part. The system is therefore controlled by position instructions delivered by a programmable logic controller via a parallel interface.

SPEED MODULATION SERVOMOTOR
Configuration



SMV-N and SMV-NP Autosynchronous servomotor drive system

CONTENTS

1st Part :

SMV-N and SMV-NP
(excluding the positioning extension)

2nd Part :

POSITIONING EXTENSION BOARD
(SMV-NP only)

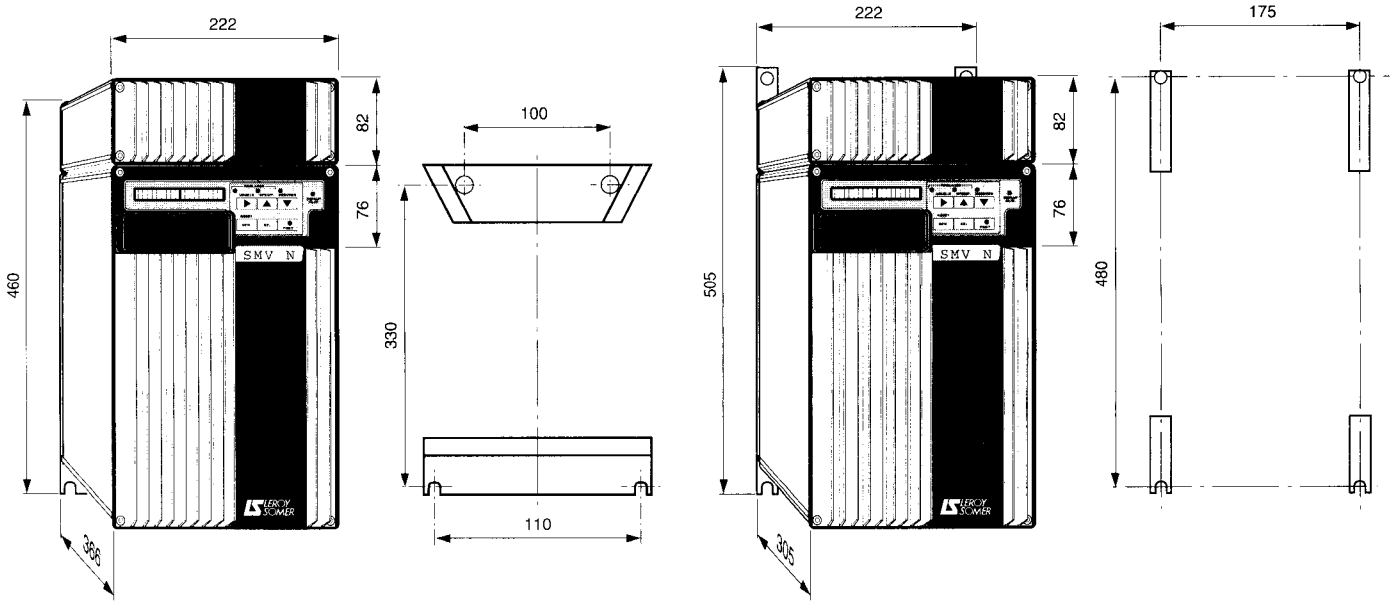
SMV-N and SMV-NP Autosynchronous servomotor drive system

1st Part : SMV-N and SMV-NP
(Excluding the POSITIONING extension)

I - INSTALLATION AND ENVIRONMENTAL CONDITIONS

- IP 55, class F autosynchronous motor
- IP 20 converter
- Storage temperature :
  - 10° to + 70 °C
- Operating ambient temperature :
  - 10° to + 45 °C
- Relative humidity without condensation ≤ 90 %
- Vibrations < 0,3 g
- The ambient atmosphere must not contain conductive dust or corrosive gases.
- Wall controller must be installed vertically.
- Ensure that there is 20 cm of free space above and below the converter.
- Provide converter cabinet ventilation if temperature exceeds 45 °C.
- The upper part of the controller (braking resistances) is detachable for installation outside the cabinet if necessary ; an 80 cm cable can be supplied for this purpose.
- The dimensions between the back of the converter and the back of the cabinet must be 40 mm minimum.
- For thermal reasons, the controllers must be fitted side by side and not one below the other.

Overall dimensions and fittings



SMV N or NP
3050 - 3075

SMV N or NP
3030

Figure 1

II - ELECTRICAL CHARACTERISTICS

A. General

The converter's power stages (terminals L1, L2, L3) are supplied with 400 V + 10 % – 15 % 50, 60 Hz.
The converter's internal electronics can be supplied with single phase 400 V 50,60 Hz (terminals L4, L5) or with single phase 220/240 V 50 Hz (terminals B1, B2).

Caution : before turning on the controller, check the voltage of your supply network. The converter's maximum current is given by the three last numbers of its designation (e.g. : SMV-N 3030 : I max = 30 A).

If the converter is supplied by a transformer, the transformer must have a power rating 1,5 time greater than the motor under constant conditions which is :

$$P_N = M_N \times \frac{2\pi \times n_N}{60} \text{ watts.}$$

M_N : constant torque at nominal speed in N.m

n_N : nominal speed in min^{-1} (rpm)

Nominal converter output current and dissipated power not including braking resistances.

	SMV 3030	SMV 3050	SMV 3075
Nominal current (A) 0 °C<T<45 °C	18	32	48
Derating 45 °C<T<55 °C	– 0,5 A/°C	– 0,6 A/°C	– 1 A/°C
Power (W) 0 °C<T<45 °C	250	400	600

Braking resistance characteristics.

	SMV 3030	SMV 3050	SMV 3075
Resistance (Ω)	50	30	18
Power (W)	450	550	750

The box containing the braking resistances can be removed from the converter to be ventilated separately.

The power supplied to the brake is : 60 VA at 24 VDC for a brake of 120 Nm.
The power supplied to the forced ventilation is : 75 VA at 220 VAC.

B. Standards

The converter complies with the electromagnetic immunity standards :
- IEC 801-2 level 3,
- IEC 801-3 level 3,
- IEC 801-4 level 3.

C. Terminal block controls

The following command signals can be inputted to the converter terminal block :

- Run/Stop by closing switch or applying a low logic state <2 V
- Speed signal (or current signal according to programming) : a voltage between terminals "Réf–", "Réf+" between + and – 10 V.
- Auxiliary speed signal : "N aux" + et – 10 V for the possible addition of a second speed signal.
- Torque limitation signal via an "Ired" 0 to + 10 V reduced current signal.
- Fault "Reset" : by closing a switch.
- Emergency stop brake external priority control : "⌞⌟", by opening a switch.
  If it isn't necessary, connect J4/8 and J4/9 together.
- Electrical brake release : "E1", by short circuit of J4/9 and J4/10.

D. Data available at terminal block

- Auxiliary voltage –10 V, 0 V, + 10 V (15mA).
- Power contactor control, by closing a dry contact : CP.

  External fault signal, by closing a dry contact : CP.
- I/N output programmable either to give image of the current reference signal or image of the speed reference signal (voltage between ± 10 V).

E. Typical efficiencies at maximum speed, at different powers.

EFFICIENCY	PN/4	PN/2	3 PN/4	PN
SMV 3050 Converter (brake supply included)	0,946	0,95	0,953	0,957
LS SMV 100 L Motor	0,76	0,85	0,875	0,885

F. Power factor at maximum speed

$$Kp = \frac{P\ active}{\sqrt{3}\ U_{rms}\ I_{rms}}$$

which determines Irms and defines the components between the converter and the supply.

I_{rms} is the quadratic sum of all the currents, the fundamental and harmonics at the input.

Note : For the fundamental current : cos phi = 1

	PN/4	PN/2	3 PN/4	PN
Power factor	0,525	0,62	0,67	0,74

III - USE OF KEYBOARD AND DISPLAY

The operator panel, located on the front and not detachable, consists of a 16 digit display.

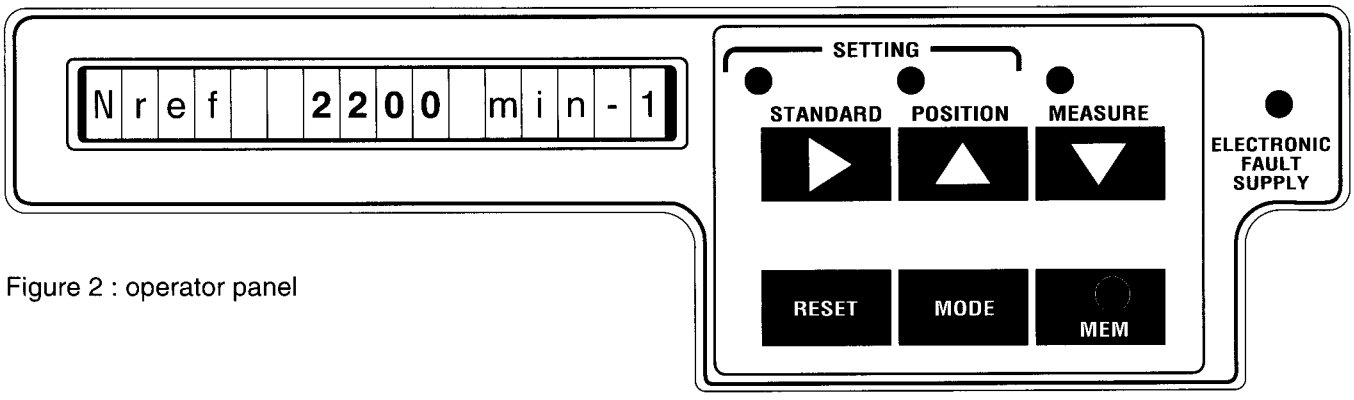


Figure 2 : operator panel

There are 3 display modes : 2 adjustment modes and 1 measure mode.
By pushing the **"MODE"** selection key, the mode can then be changed (as when **"INV"** key of a calculator is pushed).

You only have to push the mode key required :
"STANDARD" (adjustments)
"POSITION" (adjustments) or **"MEASURE"**.

An indicator lamp lights on the top left of the corresponding key.

When a mode is chosen and its indicator lamp is lit, action on the 3 upper keys doesn't correspond to mode changes any more but to selection of functions or values.

The different measure and adjustment functions are described by **IV - C**.

Access to the function required is possible by scrolling the display to show the functions available in the mode chosen, either upwards ▲ or downwards ▼.

When the function or the value to be changed is reached, to adjust, press the ▶ key.

If the adjustment is a numerical value, the first activated digit blinks. Its value can be changed by using keys ▲ or ▼.

Thus, the numerical value required can be displayed by activating each digit to be changed, one after the other. To move from one digit to the next, press ▶ .

If the adjustment to be carried out is not a numerical value (e.g. a letter), proceed as before. However, instead of seeing a number blink when the ▶ key is pushed, a letter or a group of characters will blink.

A different function can only be selected by the ▲ or ▼ keys when there are no figures or letters blinking.

Any changes of adjustments are indicated by a signal light under the **"MEM"** key.

When the operator requests the display of a value changed since the last power on, this indicator light switches on.

It will turn off after the value is stored.

The value is stored by pushing **"MEM".**

A value changed but not stored is only taken into account for as long as the electronic control board is powered.

The adjustment values can be stored in **"STANDARD"** or **"POSITION"** mode, but not in **"MEASURE"** mode, as there are no adjustment values.

IV - SETTING-UP AND ADJUSTMENTS

A. Standard connection

- Remove the two fixing screws from the lower front panel.
- Now you can access the power terminal block and connectors.

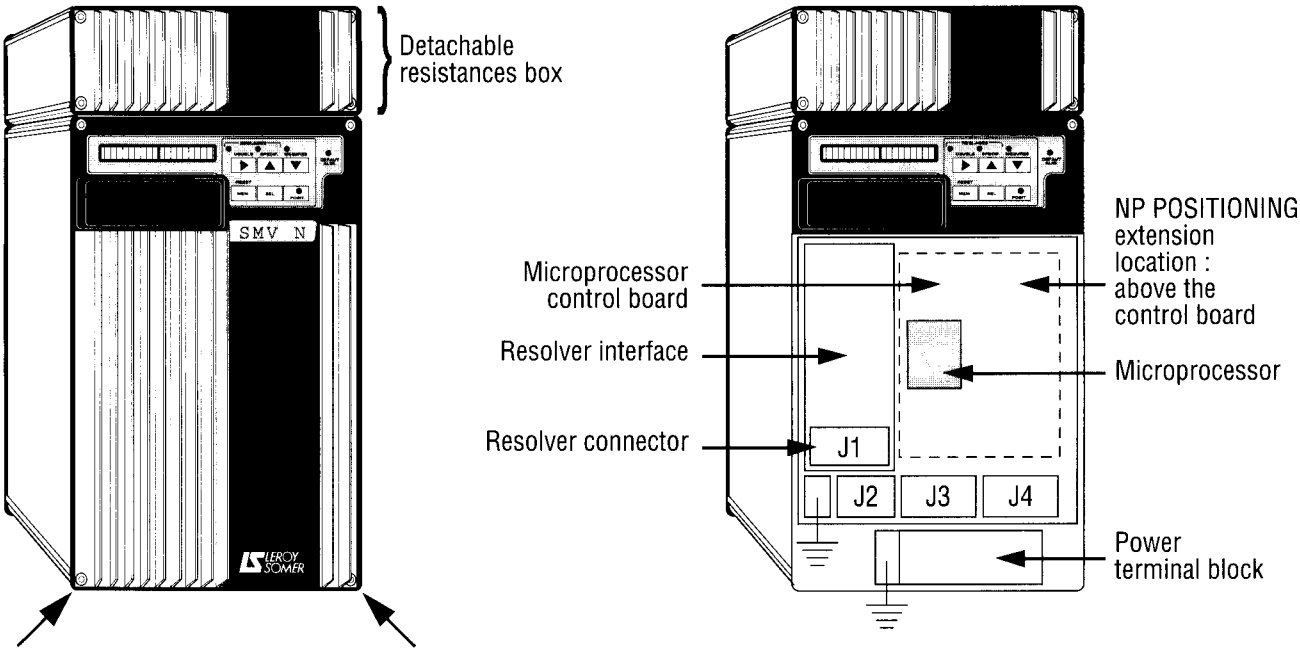


Figure 3 : front of converter

Connect converter according to figure 5 on page 11.

After checking the supply to the power and electronics, turn the converter on.

If the connection is correct, the display reads :

		S	M	V		N				3	0	3	0		

If this isn't the case, check the connection, taking into account the fault indication shown by the display.

Note : **connection to the power terminal block when system is equipped with a positioning extension.**

- Remove the cable strip connected to the NP extension via P1 connector in order to get access to the power terminal block.
- Connect up the power block.
- Reconnect the P1 connector onto the NP extension.

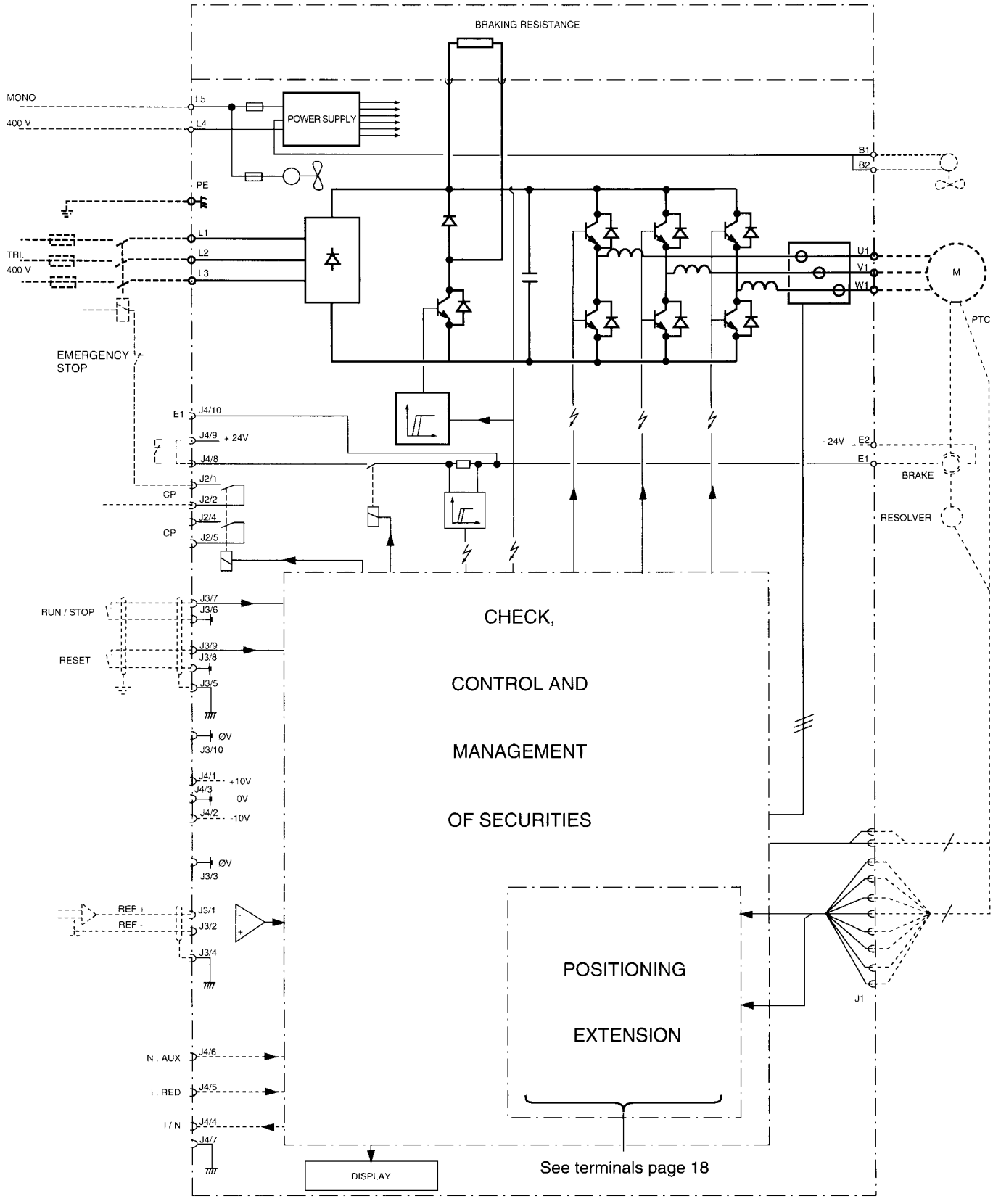
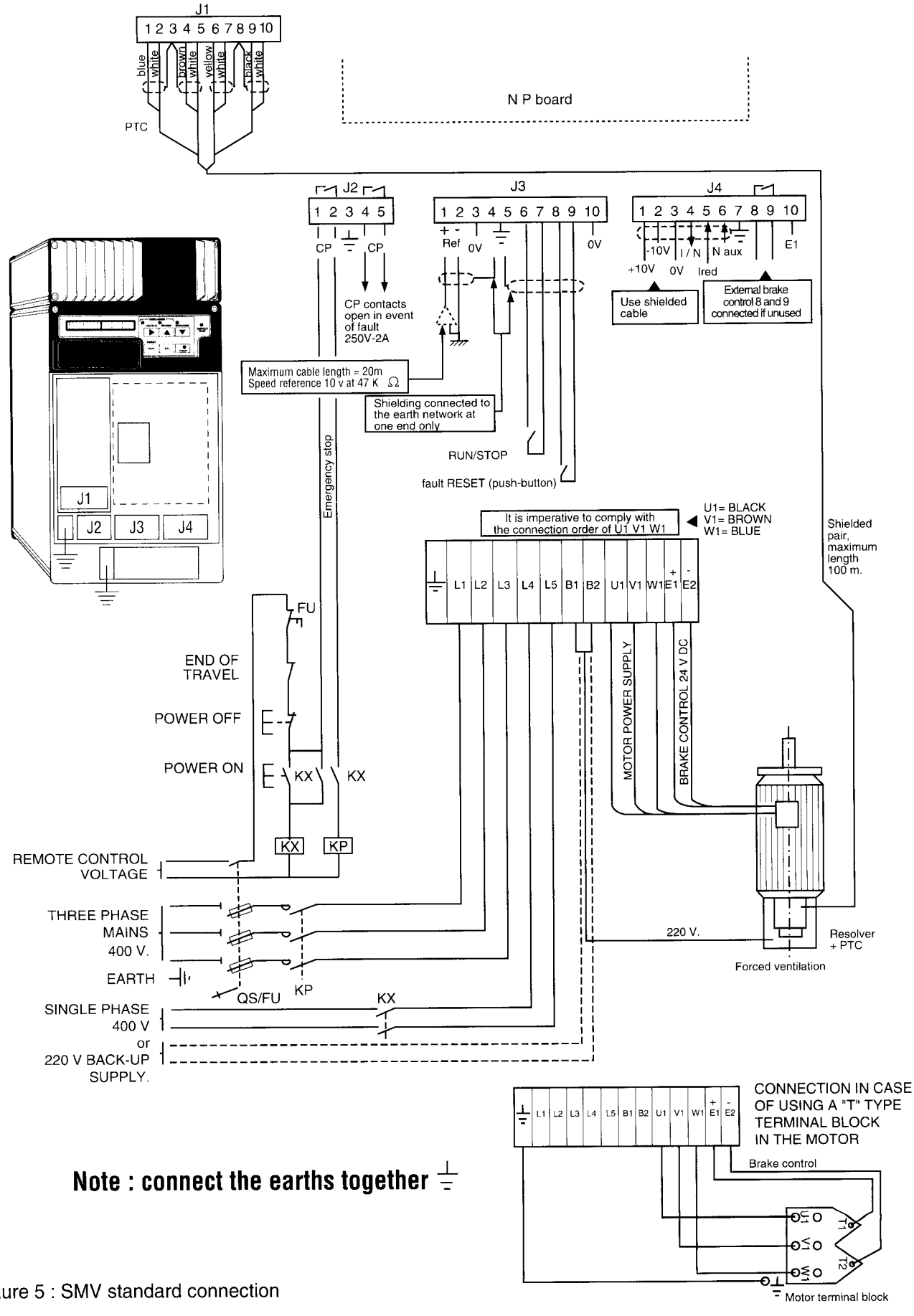


Figure 4 : converter block diagram



Note : connect the earths together ⏚

Figure 5 : SMV standard connection

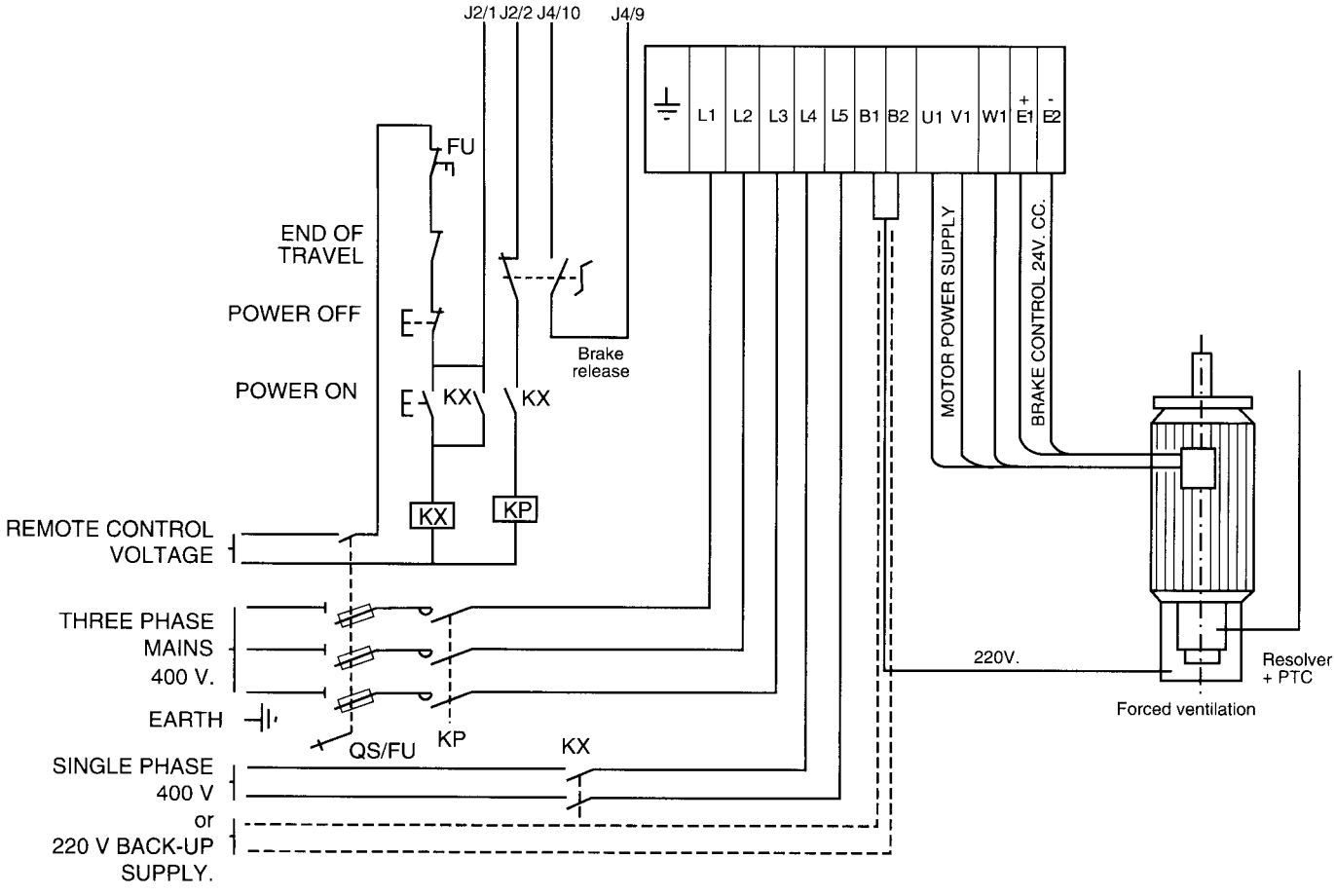


Figure 6 : switching sequence with brake release

B. Starting-up, stop and securities sequence

1 • Starting-up

The power on gives access to the operator keyboard/display : Kx closes, electronic control board is supplied.

The Run/Stop may be an auxiliary contact of the CP contact.

After a Reset and under no fault conditions, closing contact CP allows the power contactor to be closed.

Closing Run/Stop contact to "Run" state gives the order for the brake to come off and enables the electronics. The system is now operational.

Enabling the controller at the same time as closing the line contactor has no effect on the electronics, the charge up time of the capacitor is negligible.

2 • Stop

On opening the Run/Stop contact, the system brakes following the deceleration ramp programmed by T-stop.

When the motor speed is equal to 1/64th of the nominal speed, the brake comes on. The line contactor remains closed since no fault is generated.

A RESET is not necessary. Run/Stop set to Run state allows a restart, i.e. :
→ brake comes off and enabling of the electronics.
This restart can be a flying start.

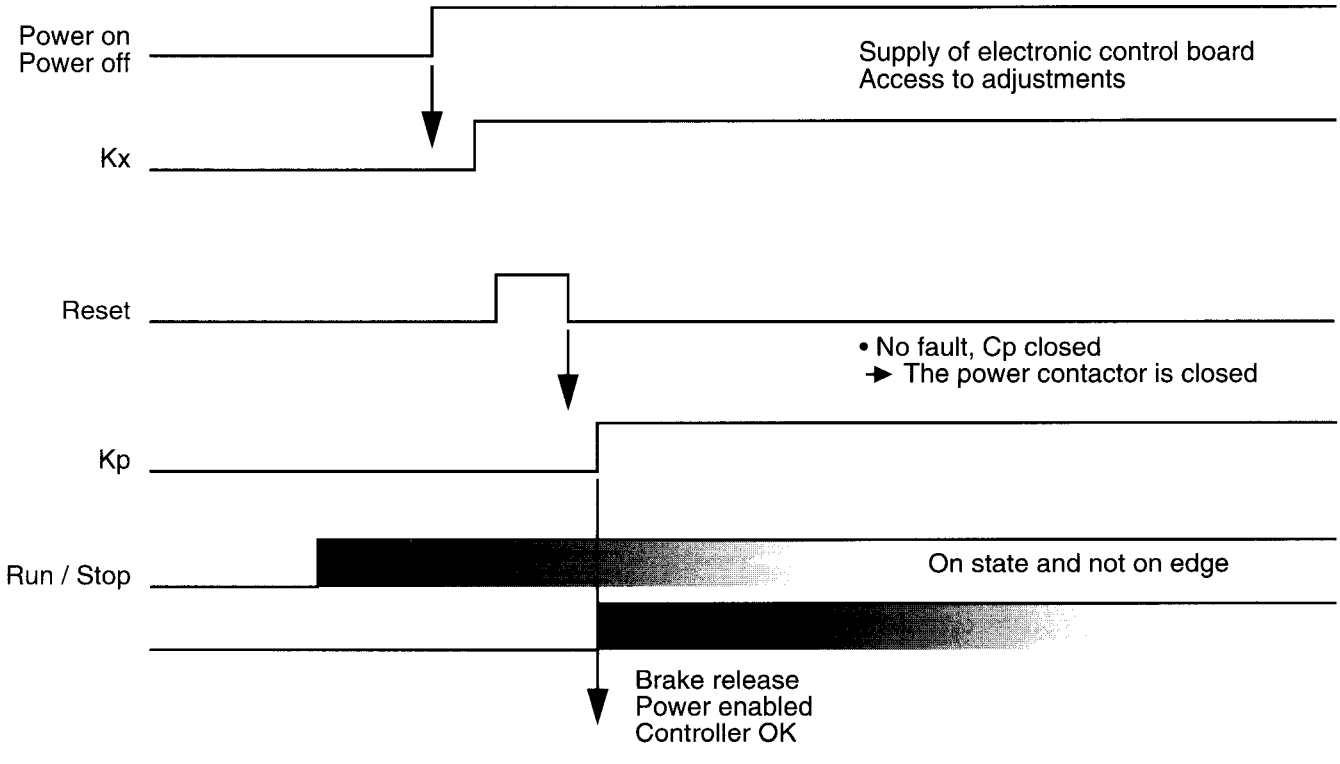


Figure 7 : starting-up sequence from figure 5

3 • Securities

The motor has a PTC thermal sensor connected to the converter, set to 130 °C.

The converter is protected by sensor in the heat sinks of the power semi-conducters.

The converter's current is limited automatically to 0.65 Imax for two securities : I^2t integration for the converters heating limit maximum current limit protection. This limitation is not indicated externally.
The fault sequences of the motor/controller are all managed by the control electronics.

The defects detected by the converter are classified according to its type :

Securities with emergency stop :

- Resolver connection fault
- Voltage of the internal D.C. bus > 800 V
- Overcurrent – I = 110 % of Imax by short circuit or motor down to earth
- Overheating of the braking resistors
- Electromagnetic brake fault
- Loss of supply to power and control electronics
- Detection of the application of the current reference at maximum level for an abnormal period of time compared to the process. The operator programs a period of time beyond which he considers there is a problem.

In each one of the cases :
- brake comes on.
- generation of a fault : CP opens ; Kp opens.
- display of the fault on the operator's panel.

RESET is required to restart.

Securities with deferred stop :

- Motor overheat greater than T max
- Overheat of converter's power stage

In each one of the cases there is :
- electric braking according to ramp programmed in Tstop.
- at 1/64 th of the nominal speed the brake comes on
- generation of a fault : CP opens, Kp opens
- display of the fault on the operator's panel.

RESET is required to restart.

Instantaneous power failures :

They are classed as follows :

- A micro-cutoff lasting < 30 msec has no effect
- A micro-cutoff lasting > 30 msec, two things may occur :
  - If the converter's internal supply network is not backed-up, there is an emergency stop. When the supply returns, whatever the state of the "RUN" command, the system remains stopped until a "RESET" order is given.
  - If the converter's internal supply network is backed-up, there is a deferred stop. The stop sequence is as described for motor and converter thermal problems. When the supply returns :

*If the automatic restart is not enabled, the system remains stopped until a "RESET" order is given.
*If you choose the opposite condition, the system automatically restarts.

Note : In the case of safe-guarded electronic supply (terminals : L4, L5 or B1, B2) with the line contactor closed, micro-cuttoffs or supply faults : phase loss or voltage drop will be detected but not taken into account if the controller is not enabled : Run/Stop in the Stop position.

In the event of faults, one or several of the following messages may appear, overriding other displays :

- *RESOLVER*
- *OVERVOLTAGE*
- *GROUND CONNECTION*
- *OVERCURRENT*
- *SERVO SECURITY*
- *RESISTANCES TH.*
- *SUPPLY*
- *CONVERT TH.*
- *MOTEUR TH.*
- *BRAKE*

C. Converter programming

STANDARD	POSITION	MEASURE
SMV **N 3030** MOT **71 M 30 C** FREIN **BK 18** T acc/dec **--,--** S T stop **--,--** S T securit **--,--** S N max **---** min $^{-1}$ I max **--- A** Stabilité **1.0** Perf. dynam. **6** Ch. A Entr. V/I ? **V** Ch. B Sort. V/I ? **I** Ch. C Red. auto. ? **N** Ch. D Ired J4/5 ? **0** Ch. E Th Res x **1**	Inactive without POSITIONING Extension	Version C-0/21 N réf. ---- min^{-1} N mot. ---- min^{-1} I mot. --- A Utilis. mot -- % Dsmv

1 • Locking of adjustments

The variator is delivered, locked.

Locked adjustments :
Reading mode only, the operator can read the system's configuration in both adjustment modes : "STANDARD" and "POSITION" and display the conditions of the system in "MEASURE" mode :

Unlocked adjustments :
The operator may change the parameters of his system : "writing" mode.

Keyboard locking is carried out by the jumper link on the resolver board.

Unlocking procedure :
Remove the lower panel of the front side : see paragraph **IV A.** Standard connection, page 9.
The resolver board is marked "SPR".

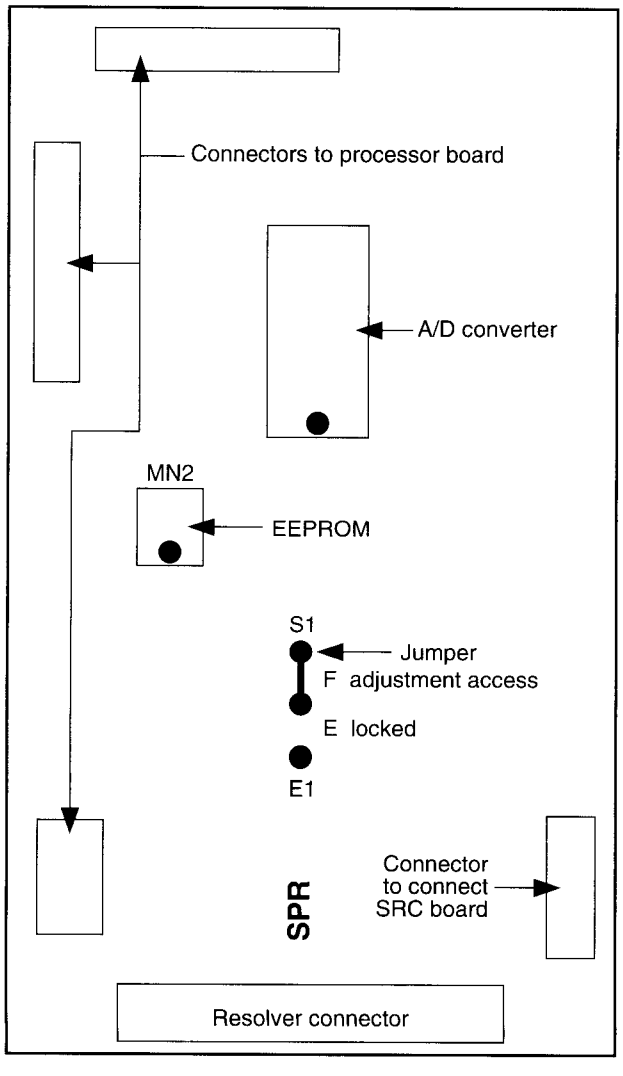


Figure 8 : resolver board

2 • "STANDARD" adjustments

a. Definition of electronics

		S	M	V		N	P			3	0	3	0		

N : type of converter
N : digital
NP : with POSITIONING extension
030 : converter's rating (peak ampere)
030 - 050 - 075

b. Motor definition

M	O	T	.		1	0	0	L			3	0		C	

100 L : type of motor : frame
71M-71L-90S-90M-90L-90SL-100L-132L.
30 : nominal speed divided by 100
20 - 30 for 71 and 90,
22 - 26 - 30 for 100L and 132L.
C : ventilated
- : not ventilated

c. Brake

	F	R	E	I	N		:		B	K		1	2	0	

BK 120 : maximum brake torque in Nm
8- 18 - 30 - 60 - 120
without : no brake

d. Acceleration, deceleration

T	a	c	c	/	d	e	c		0	9	.	9	9		s

$00.01 \leq Tacc/dec \leq 99.99$

The acceleration and deceleration time is adjusted by setting on the display the time taken to go from zero speed to maximum speed.

The speed variation of the mobile as a function of time is controlled following an S-curve.

By automatic adjustment, the maximum acceleration derivative is fixed in such a way that each one of the parabolic parts of the S curve has a duration equal to 1/8th of the time taken to go from zero speed to maximum speed.

e. Stop ramp

T	s	t	o	p				0	0	.	2	3		s

00.01 ≤ Tstop ≤ 99.99
The system brakes electrically according to this ramp :
- due to opening Run/Stop contact,
- due to motor or converter's thermal problems,
- due to an instantaneous power failure with safe-guarded supply.

f. System securities

T	s	e	c	u	r	i	t		0	2	.	0	0		s

00.01 ≤ Tsecurit ≤ 99.99
Should the application time of the internal current reference at maximum level be greater than Tsecurit, there is emergency stop.
e.g. Tsecurit must be programmed greater than Tacc/dec.
e.g. detection of the cutting of the power cable between controller and motor.

g. Maximum speed

N	m	a	x			2	2	0	0		m	i	n	-	1

The maximum motor rotating speed can be adjusted by the Nmax parameter between 0 % and 110 % of the motor nominal speed.
This value calibrates the speed reference :
10 V = speed reference equal to N max

h. Current limitation

I	m	a	x						0	3	0		A	.

Current limitation (thus torque limitation) can be carried out in two different ways :
It is fixed and programmed by the Imax value.
It can change and it consists of an analogue input 0 - 10 V : see **n**
Imax cannot exceed the converter's peak current, under any conditions.
This limitation is only taken into account if "N" is selected for option D : see **n**

i. Stability

S	t	a	b	i	l	i	t	é				0	2	.	0

00.1≤ Stability ≤ 99.9
The stability parameter is used to adjust the speed counter-reaction loop gain for optimizing the system's stability.
Program the stability parameter value equal to the ratio between the total moment of inertia : motor + load related to the motor shaft, and the moment of inertia of the motor.

j. Dynamic performances

P	e	r	f	.	d	y	n	a	m	.				6	

This parameter fixes the response time of the speed loop. It is connected to the phase lead of the speed regulator. The adjustments are from 1 to 8.
1 - slow response Tacc/dec > 2 seconds
8 - fast response Tacc/dec < 0.2 second

Stability and Dynamic performance adjustment procedure

The adjustment of the stability according to i is not always satisfactory, especially when the motor output shaft drives a mechanical system with a lot of play :
- reduce stability if motor rumbles or vibrates
- increase stability if there is a large speed overshoot when accelerating.
Alternatively, start by adjusting a low dynamic performance value, and increase this parameter ensuring a satisfactory stability.

k. Reference choice (speed or torque)

C	h	.	A		E	n	t	r	.	V	/	I	?		V

V : the input voltage reference on "Réf- Réf+" of the terminal block represents speed. If this voltage has the sign indicated on the terminals, motor runs clockwise viewed from the shaft end (and vice versa).

In the case where two SMV systems have their motors linked mechanically, one of the two systems must be the master and the other the slave. The master runs by speed regulation and sends a current reference to the slave via the J4/4 output of the (I/N) terminal block.

On the slave system set : I
so that the voltage on "Réf-Réf+" is considered as a current reference.

l. Programming of J4/4 terminal of the terminal block

Ch. B Sort. V/I? V

V : J4/4 is the image of the motor's actual speed
(N max = + 10 V, - Nmax = - 10 V)
I : J4/4 is the image of the internal current reference
(Imax = + 10 V, - Imax = - 10 V)

m. Automatic restarting

Ch. C Red. auto? N

N : After an instantaneous power failure to the power board, the system remains stopped until RESET.
O : the system automatically restarts after an instantaneous power failure to the power board.

n. Torque reduction via the terminal block

Ch. D Ired J4/5? 0

N : converter's maximum current, thus motor torque, can be reduced via the keyboard by Imax.

O : converter's maximum current is limited by the analogue input 0-10 V, on J 4/5
O V : zero current
10 V : maximum current – converter's rating, Imax value is no longer taken into account.

o. Resistance box

Ch. E Th. Res x 1

Several resistance boxes can be connected onto the controller's D.C. bus.
The protection for these resistances is calculated at microprocessor level.
The number of boxes must be clearly indicated. It varies from 1 to 5.

3 • "MEASURE" Mode
a. SMV version

Version C-0/21

material version

year
0 : 1990
5 : 1995

software version
week in the year
marketed.
To be specified when calling for service.

b. "Nref."
Reference speed requested from system in min^{-1} (rpm).

c. "Nmot."
Motor actual speed in min^{-1} (rpm).

d. "Imot."
Current absorbed by motor in A.

e. "Utilis. mot"
Motor usage rate : thermal image of the system in % of the allowed limit.

f. "Dsmv"
Diagnosis aid
The codes corresponding to the key software steps made by the microprocessor are displayed.

V - SRC EXTENSION BOARD :

Resolver → Encoder conversion

A. Function of board

To emit signals like an "incremental optical coder" from SMV.
It exploits the resolver on the motor shaft for any type of servo-positioning by an outside source : axis board ; programmable logic controller ; or digital control.

B. Installation - Connection

Installation

The board is external to the controller
External dimensions : 105 x 125
4 holes of dia. 4 allow fixing of the board on rails : see fig. 9 page 20

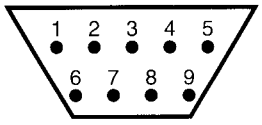
Connection

The board is delivered with :
- 1 cable strip with 10 pin female connecter and SUB-D 9 pin female plug.
- 1 bag of screws for fixing, under the controller, the SUB-D plug.
- 1 shielded cable, 1 m long, and its two 9 pin SUB-D male plugs.

To install the cable strip :
- 10 pin female connector on resolver board (Drawing of the board in fig. 8 page 16)
- fit SUB-D female plug under the controller in the designated position

Fit the shielded cable between the controller and the board on the "Resolver signals input" side.
Connect up to 220 V ~
This supply could be taken across B1 and B2 on the controller's power terminal block.

"Encoder signal outputs" connection :

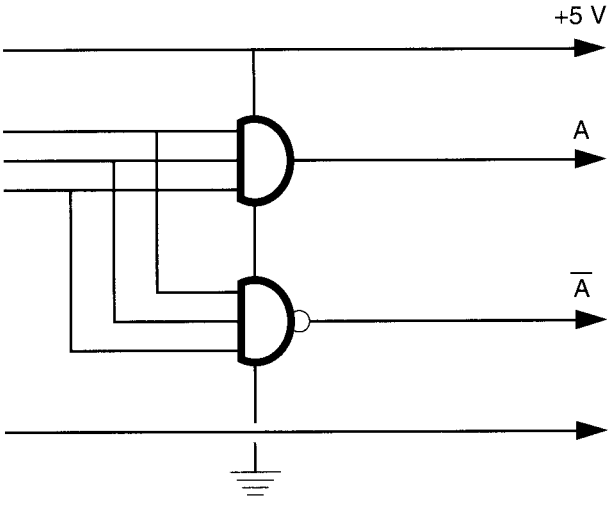


Front view of male isolated connector

Pin	1	2	3	4	5	6	7	8	9
Function	⏚	+5V	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	F

Output stages characteristics :
→ line transmitter : MM 88 C 30 circuit

Is max = 10 mA



→ cable length between the SRC board and your positioning electronics : 20 meters max.

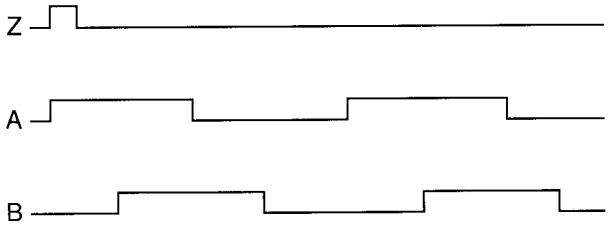
→ inputs via optocouplers or line receivers.

C. Operation

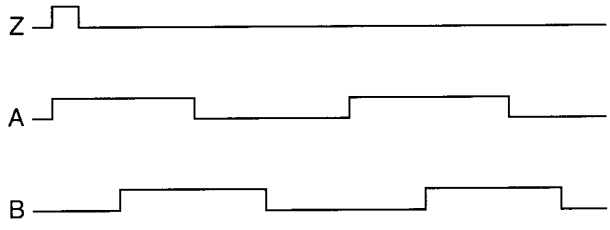
Output F : validation
F = 0 : output signals A, B, Z not valid
F = 1 : output signals A, B, Z valid
Z output : resolver's 0 impulse

512 pulses per revolution

Waveforms



Clockwise rotation viewed on the motor shaft end.



Anti-clockwise rotation viewed on the motor shaft end.

No adjustment is required for this extension.

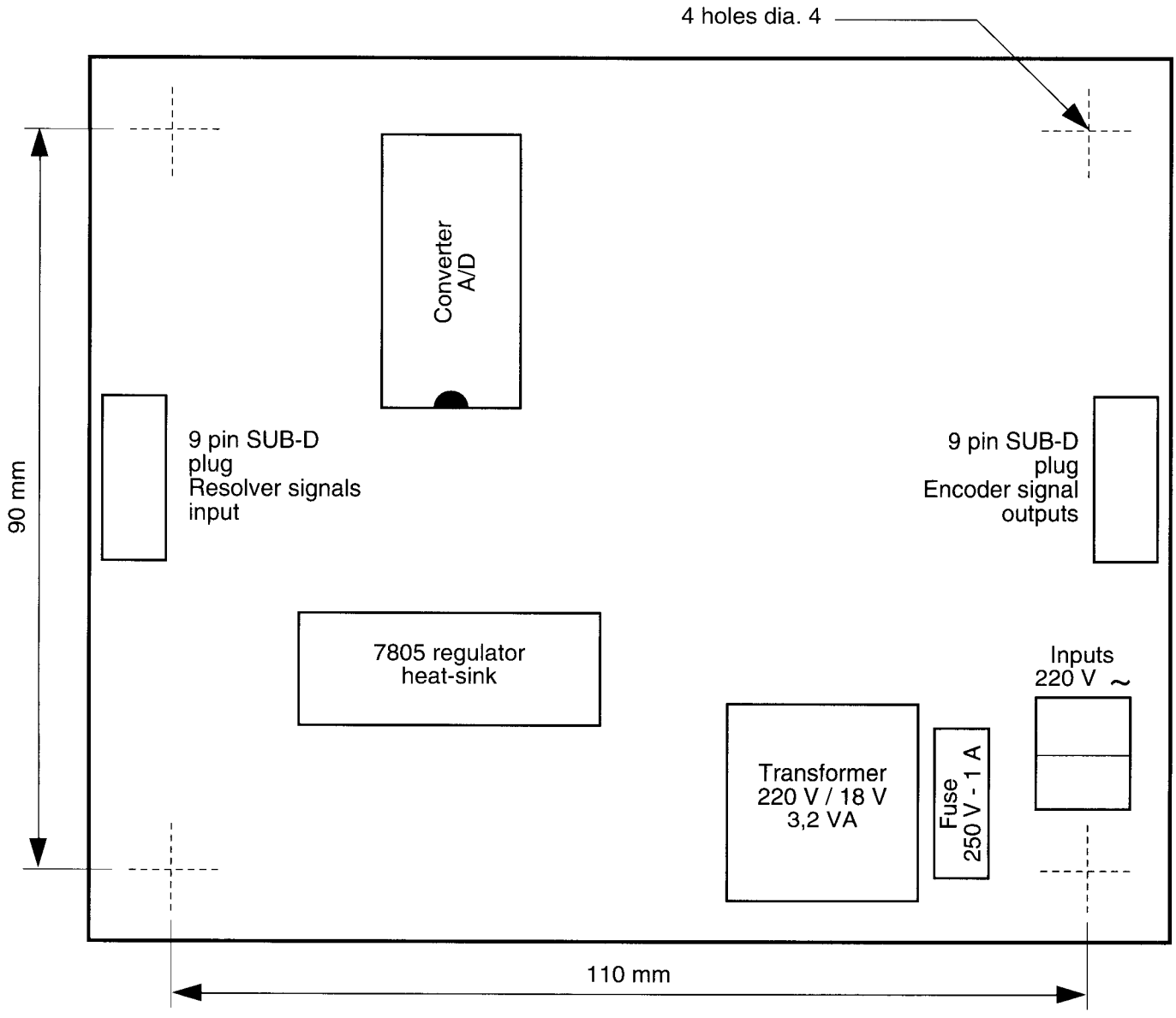


Figure 9 : SRC extension board.

2nd Part :

POSITIONING EXTENSION
SMV-NP only

I - PRESENTATION OF THE EXTENSION
Functions

By receiving commands from a programmable logic controller : closing or opening of contacts, the SMV-NP converter's POSITIONING extension allows positioning of a mobile on an axis :

- either at positions (maximum 8) whose distances were recorded from the origin Og.

- or at indexed positions (maximum 256) according to 17 different indexed steps. We thus define groups of positions defined by an origin and an indexed step. The operator describes his group by entering end numbers of the positions concerned : see figure below : 2 groups

- or by programming increments (maximum 8). The mobile moves from recorded value on the operator's panel taking into account the position error from the previous move.

For any positioning or move, an end of move signal is sent to the programmable logic controller (PLC).

Along the complete travel of the mobile, 4 passing zones at reduced speed can be specified. The mobile's passage in these zones is signalled to the PLC.

At each movement, the speed variation curve as a function of time is in the shape of an S curve (speed ramp with parabolic ends at zero speed and maximum speed).

The inputs/outputs of the POSITIONING extension are designed to be directly connected to the inputs/outputs of the PLC by a parallel interface.

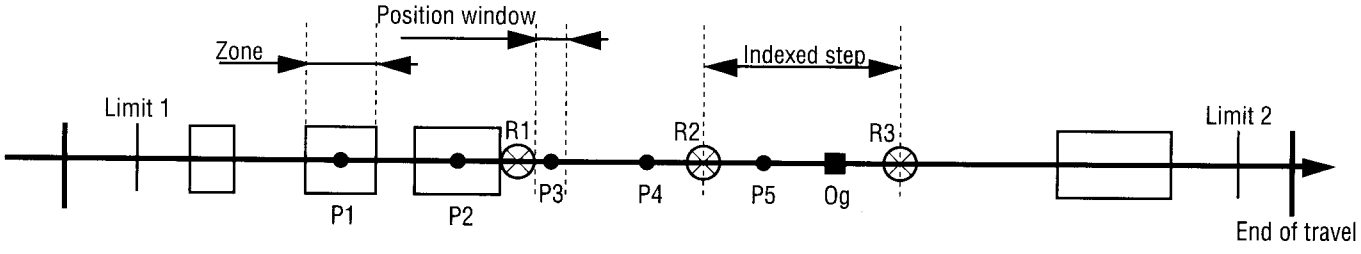
When the POSITIONING extension is functioning, the input into the "Naux" terminal block is not active. "Ref.-" and "Ref.+" can be considered if it is enabled in the operator's panel by programming. Under these conditions, the system is not speed controlled but only follows the analogue speed limitation defined by these inputs.

The setting-up of the POSITIONING extension is carried out at 2 levels :

- position request by only controlling the logic inputs/outputs of the POSITIONING extension board.

  This control can be carried out by a programmable logic controller.

- initialization of the POSITIONING board and programming the positions in the operator's panel by clear messages.



Limit 1, Limit 2 : software end-stops
R1 ; R2 ; R3 : group 1
P1 ; P2 ; P3 ; P4 ; P5 : group 2

Figure 10 : positioning on an axis : indexed positions separated into 2 groups.

II - PROGRAMMABLE LOGIC CONTROLLER (PLC) INTERFACE : INPUTS/OUTPUTS

A. Characteristics

Link to the PLC – parallel type with 16 inputs and 16 outputs.

1. Inputs

Inputs "all or nothing" by closing a contact between the input and the common.

All inputs are isolated from the outputs and from the converter's control.

All inputs are referenced to the same common : com 1

Contact closed = state 1
Contact open = state 0

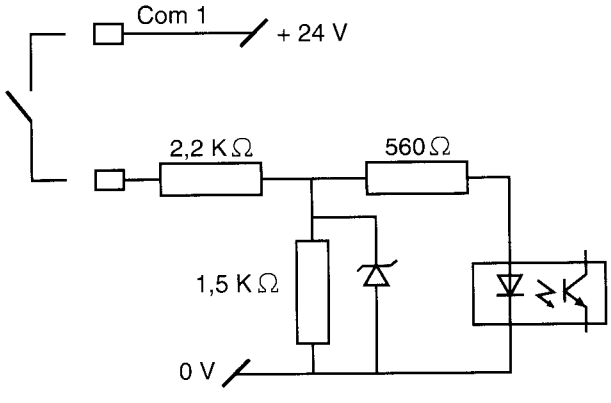


Figure 11 : SMV input

Inputs isolated by optocouplers
1 common wire at + 24 V supply.

Nominal values :

Voltage : 24 V
Current : 7,5 mA
Power : 180 mW
Impedance : 3 KΩ

Limit values of inputs :

State 1 : voltage ≥ 14 V
current ≥ 5 mA

State 0 : voltage ≤ 5 V
current ≤ 1,4 mA

Isolation :
Between tracks and bus ≥ 10 MΩ at 500 VDC.

2. Outputs

"All or nothing" outputs by static relays.

All outputs are isolated with from inputs and from the converter's control.

All outputs are referenced to the same common : com 2

Contact closed = state 1
Contact open = state 0

Relay with 1 common wire to all outputs.
Nominal AC values :
Voltage 48V AC
Current 80 mA

Nominal DC values :
Voltage 65 V DC
Current 80 mA

Output impedance : 44 Ω
Isolation :
Between tracks and internal bus 500 V Rms 50 Hz.

Protection :
No protection against inductive overvoltages.

B. Description

1. General diagram

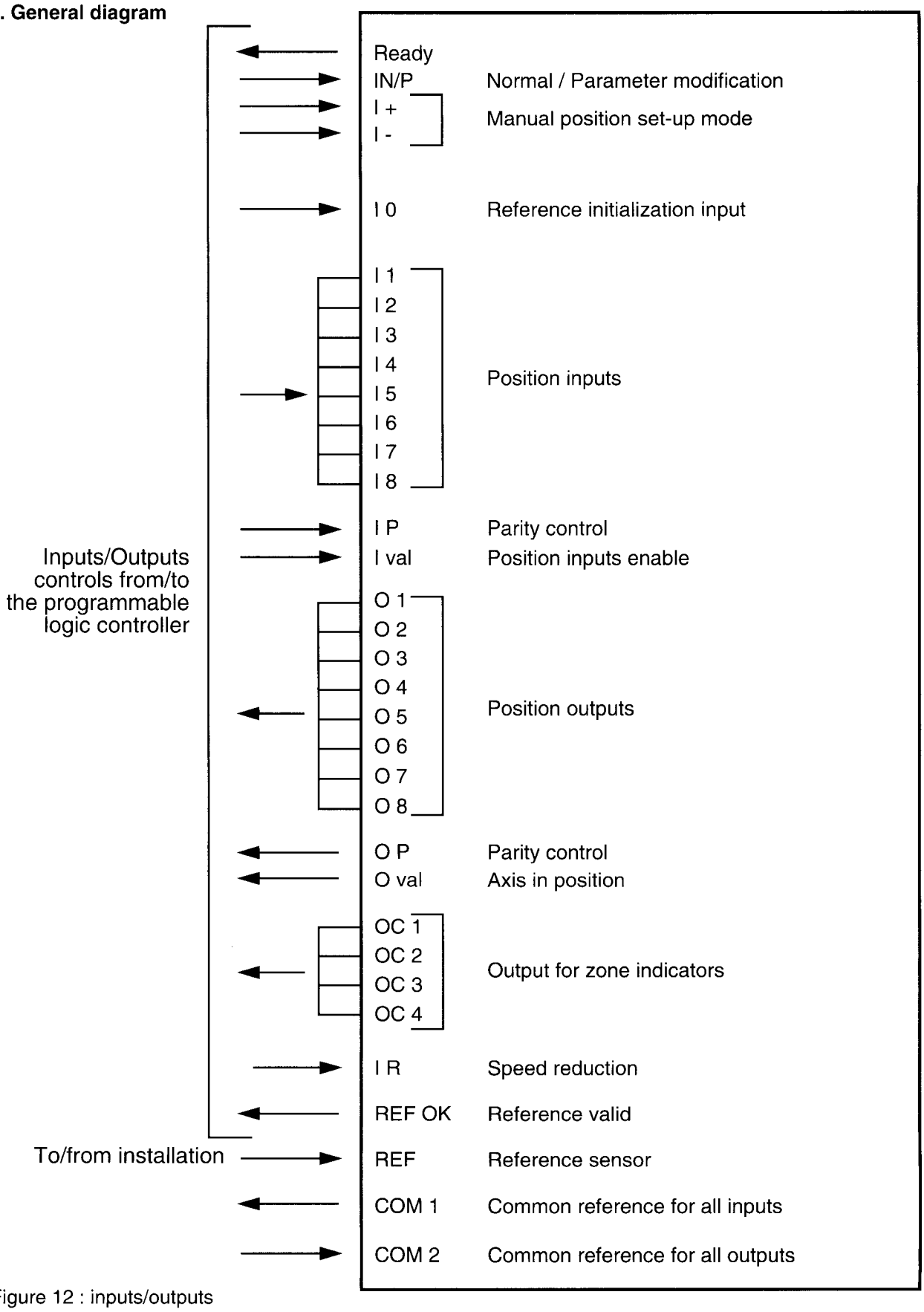


Figure 12 : inputs/outputs

2. Inputs (16 in total)

a) **I0** : reference initialization input
REF.
Activation of the I0 input initialises the reference : setting of zero rotation, via initial position sensor in its place on the installation, connected to the extension board REF.

b) **I1 to I8** : 8 position inputs.

c) **IP** : parity bit.
Ival : validation input.
They must only be wired for a positioning with more than 8 positions to be attained (binary code).
IP : operation validated if the sum of the input bits I1 to I8 + IP is odd.

IVAL : position inputs are considered on transition from 0 to 1 and operation is stopped if transition from 1 to 0.

d) **I - and I +** : manual positioning mode.
Setting these inputs to 1 simultaneously leads to :
- Fixed speed control,
- Movement at reduced speed.
They have priority.
They allow manual control and position set-up mode.
I+ : clockwise movement seen from the shaft end.
I- : anti-clockwise movement.

After validating I+ ou I-, it is not necessary to re-initialise the reference before restarting a position cycle.

e) **IR** : speed reduction.
In state 1, the system runs at a reduced speed, lower than 20 % of the maximum speed.

f) **IN/P** : normal/parameter modification.
IN/P = 1 : parameter modification function : the operator can change the parameters of the "position" mode if the jumper on the "resolver" board is in keyboard unlocked position.
IN/P = 0 : normal operation : the position adjustments are fixed, except for the SHIFT parameter which is still accessible.

3. Outputs (16 in total)

a) **REF OK** : valid reference.
It is set to 1 if the initial reference is correct. No position request is considered if the reference is not validated.

b) **O1 to O8** : 8 position outputs.

c) **OP** : parity bit.
OP is such that the sum of the output bits O1 to O8 + OP is odd.

d) **Oval** : axis in position.
Oval is set to 1 only when the mobile is in the position window.

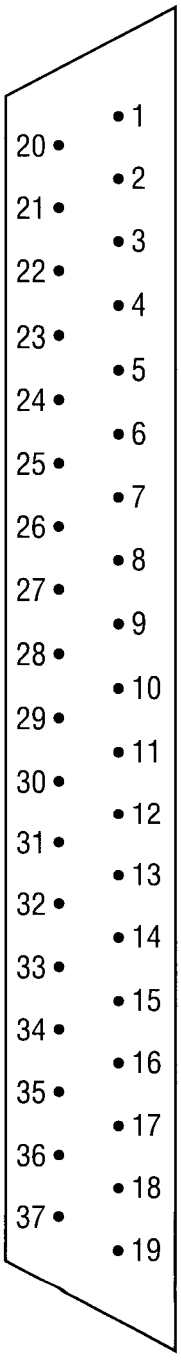
e) **OC 1 to OC 4** : zone indicators.
Each output is activated when the mobile passes between two end positions of the corresponding zone defined by programming.

f) **Ready** : extension ready.
This output must be set to 1 before any position request. In state 0 the microprocessor cannot receive an order.

C. Connection

The connection of all the inputs/outputs is made by a single connector : 37 pin SUB-D female plug under the controller.

A 3 m cable is provided with the controller :
- male plug for the controller end
- female plug for user end.



Front view

	Terminal no.	Designation
References	11 - 30	com 1
	1	com 2
Inputs	29	REF
	12	I0
	31	I1
	13	I2
	32	I3
	14	I4
	33	I5
	15	I6
	34	I7
	16	I8
	35	IP
	17	Ival
	36	IR
	18	I+
	37	I-
	19	IN/P
Outputs	20	Ready
	2	REF OK
	21	O1
	3	O2
	22	O3
	4	O4
	23	O5
	5	O6
	24	O7
	6	O8
	25	OP
	7	Oval
	26	OC1
	8	OC2
	27	OC3
	9	OC4

SMV - NP CONNECTION DIAGRAM

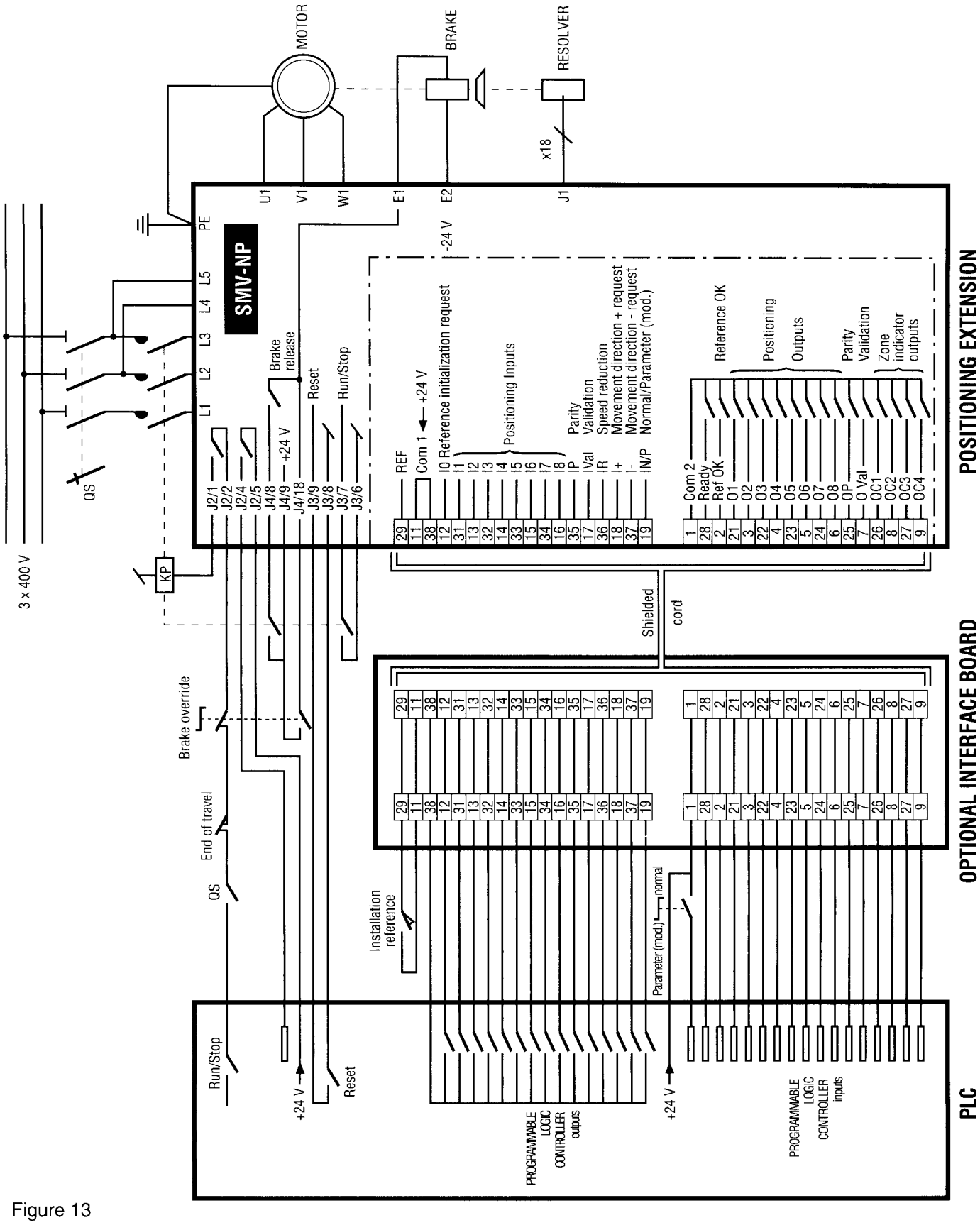


Figure 13

III - DATA CAPTURE ON THE INSTALLATION

A. Reference sensor

The initial reference sensor is mounted on the part of installation which has the mobile to be positioned. It is used to locate the revolution of origin of the installation by sending the zero information to the REF input of the extension board terminal block.

The zero of the drive system, seen by the converter, is given by the zero of the resolver integrated into the SMV motor, which can be anywhere in the revolution of origin.

Therefore, there is a difference between the zero of the drive system's sensor and the installation zero defined by the initial reference sensor. The value of the difference is between ± 1/2 motor revolution.

In order to avoid any ambiguity involving the direction of mobile displacement when taking the references, the information provided by the initial reference sensor must be an information about its state :
state 0, the mobile is at the right (left) of the origin
state 1, the mobile is at the left (right) of the origin.

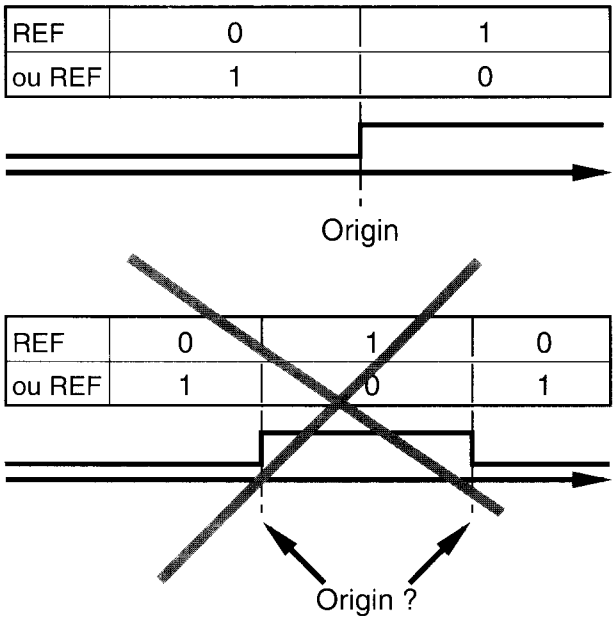


Figure 14 : Reference taken on "long cam"

B. End of travel switches

For security, the end of travel switches must not act on the positioning extension.

They must directly cut the supply connection of the SMV motor brake (J4 terminals 8 and 9) and possibly the power contactor coil supplying the SMV converter.

IV - DESCRIPTION OF FUNCTIONS

A. Reference initialization

After loss of supply of the electronic control or after an instantaneous power failure it is necessary to re-initialise the reference. It is carried out at low speed by setting I0.
When the reference initialization is correctly completed REF OK output is set to 1.
No positioning request can be considered before taking this reference.

B. Incremental positioning

The incremental positioning functions are allocated to inputs I1 to I8 : 8 different increments. IP and Ival must not be wired.
Outputs 01 to 08 and OP are not to be wired, they are not used.

Function :
The activation of one of these inputs orders a movement of the mobile by the increment programmed in the operator's panel.

The Oval output is set to 1 when the mobile is in the position window around the arrival point.

A reference initialization is needed although the positioning cycle is not absolute. The reference sensor could be simulated for example by using the programmable logic controller controlling the system, one of these outputs is connected to REF.

Positioning errors are not cumulative, the system knows the signed error on the previous movement and will take it into account for the following increment.

C. Absolute positioning

1 . 8 positions at the most

The positioning functions are allocated to inputs I1 to I8 : 8 different positions.
IP and Ival should not be wired.
OP is not used.

Function :
The activation of one of these inputs orders the positioning at the distance allocated to this input. The distance is measured from the positions' origin Og modified by the SHIFT.
For each input there is a corresponding output.

Each output 01 to 08 is activated when the mobile is at the position (i.e. in the position window) which corresponds to it.
Oval is activated when the final position is reached.
There is no accumulation of error since the system is regulated with respect to the final position : the initial position is not important.

Adjustable parameters :
Distance of the position allocated to each input.

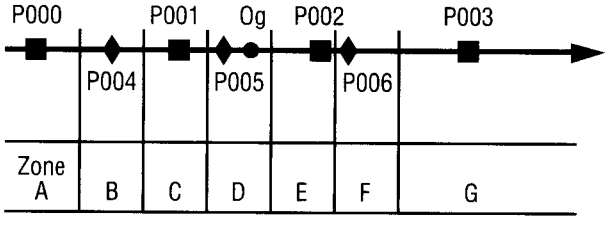
2. More than 8 positions : indexed positioning. GROUP mode

With a binary coding of the 8 inputs I1 to I8, 256 positions can be programmed according to 17 different groups.
A group is a set of separate positions, separated from another group by its step size. 2 groups can overlap each other. IP must be used, operation is validated if the sum of the input bits I1 to I8 + IP is odd.

Function :
The activation of a code on these inputs, together with parity control and validation by the Ival input, leads to positioning at the distance allocated to this code.
The distance is measured from the positions' origin 0 modified by the SHIFT. Oval is set to 1 when the mobile is in the position window around the point to be attained.
Outputs O1 to O8 are controlled as follows :
output of the code on these 8 bits corresponding to the passage of the mobile in the zone including the position linked with the code and bounded by the middle points between the 2 closest positions.

example :

Group 1 : P000 to P003
Group 2 : P004 to P006



ZONE	POSITION CONCERNED	Code on O1 to O8 + OP								
		O1	O2	O3	O4	O5	O6	O7	O8	OP
A	P000	0	0	0	0	0	0	0	0	1
B	P004	0	0	1	0	0	0	0	0	0
C	P001	1	0	0	0	0	0	0	0	0
D	P005	1	0	1	0	0	0	0	0	1
E	P002	0	1	0	0	0	0	0	0	0
F	P006	0	1	1	0	0	0	0	0	1
G	P003	1	1	0	0	0	0	0	0	1

There is no error accumulation since the system is regulated with respect to the final position.

Adjustable parameters :
Programming of groups :
- number of groups,
- number of the first position and its distance,
- step between 2 positions of the group,
- number of the last position.

D - Speed reduction

Three methods of speed limitation are available.
These methods can be used simultaneously. Under these conditions, the lowest limitation is the one considered.

1 : By programming : 4 zones.
A maximum of 4 zones are programmable, only in "Absolute Positioning" mode via the operator's panel. A zone is defined by its 2 end limits, speed limitation in the zone, the direction of the passage where the limitation is valid.

2 : Via the terminal block : Input IR (POSITIONING board)

Function :
When Input IR of the POSITIONING board is activated, the maximum value of the speed is reduced to the value programmed by the parameter "Vred" § **V - B** : Programming of the board.

Adjustable parameter :
Value of the reduced speed.

3 : Via the terminal block : inputs Ref (control board). By programming, it is possible to validate or invalidate these inputs.
This validation is carried out by the function :
"'Vit = % Vmax" → § **VI - B** : Programming of the board.
The speed is then limited to a value proportional to Vmax, Vmax corresponds to 10 V.
Whatever the position on the axis, it is possible to adjust the movement speed.

E - Manual position set-up

This function allows, when setting-up, setting of the stop positions or mobile movement values, by sight and not by computation from the theoretical characteristics of the machine.

Operation mode :

* unlock the keyboard :
  jumper in F position on resolver board
* unlock the position adjustments :
  input IN/P of the POSITIONING extension set to state 1.
* validate the "Apprent. pos." (Manual position set up) mode see § VI - B : Programming of the board : in POSITION mode in the "Init. system" section, move to "Apprent. pos." and answer "O" (Y).
  Inputs I+ et I- allow movement of the mobile in both directions, at reduced speed..
  Setting these inputs to state 0 immediately stops the mobile.
* initialise a reference
* 3 types of manual position set-up according to the positioning mode :

- incremental mode

- in POSITION mode move to the increment to be adjusted,
- move the mobile by the required step from Og,
- store via the keyboard the value displayed in the operator's panel.

- absolute mode with max. of 8 positions :

- in POSITION mode move to the position to be adjusted,
- move the mobile to the required position,
- store via the keyboard the value displayed in the operator's panel.

- absolute mode with more than 8 positions :

- in POSITION mode move to the group to be defined,
- enter via the keyboard the number of the last end position of the group,
- move to the next line,
- move the mobile to the position required,
- store,
- move to the following line : constant step between each position of the group,
- move the mobile by increment required,
- store.

Except for setting-up or adjustments, invalidate "Apprent. pos." and function.

V - SECURITIES AND INSTANTANEOUS POWER FAILURE

In any normal positioning cycle, the system is regulated with respect to the last position requested in the absence of position order.

The following states cause an operation stop by setting the motor speed to zero :

1 : Two or several inputs activated simultaneously in incremental positioning or in absolute positioning with less than 8 positions.

2 : Imparity fault of inputs in GROUP mode.

3 : Invalidation of inputs : Ival going from state 1 to state 0.

4 : Suppression of movement order : input I1 to I8 in state 0.

5 : Input "Run/Stop" of converter in "Stop position".

6 : Converter fault indicated by opening of CP contact.
The fault sequences are managed in the same way as a system without positioning.

7 : Loss of position needing a reinitialization of the reference : output REF OK at 0.

For the first 6 cases there is a position regulation with respect to the stop point : the load cannot move except if a disrupting torque occurs which is greater than the one supplied by the SMV system.
For case 7, the system is set at zero speed.

Instantaneous power failures :

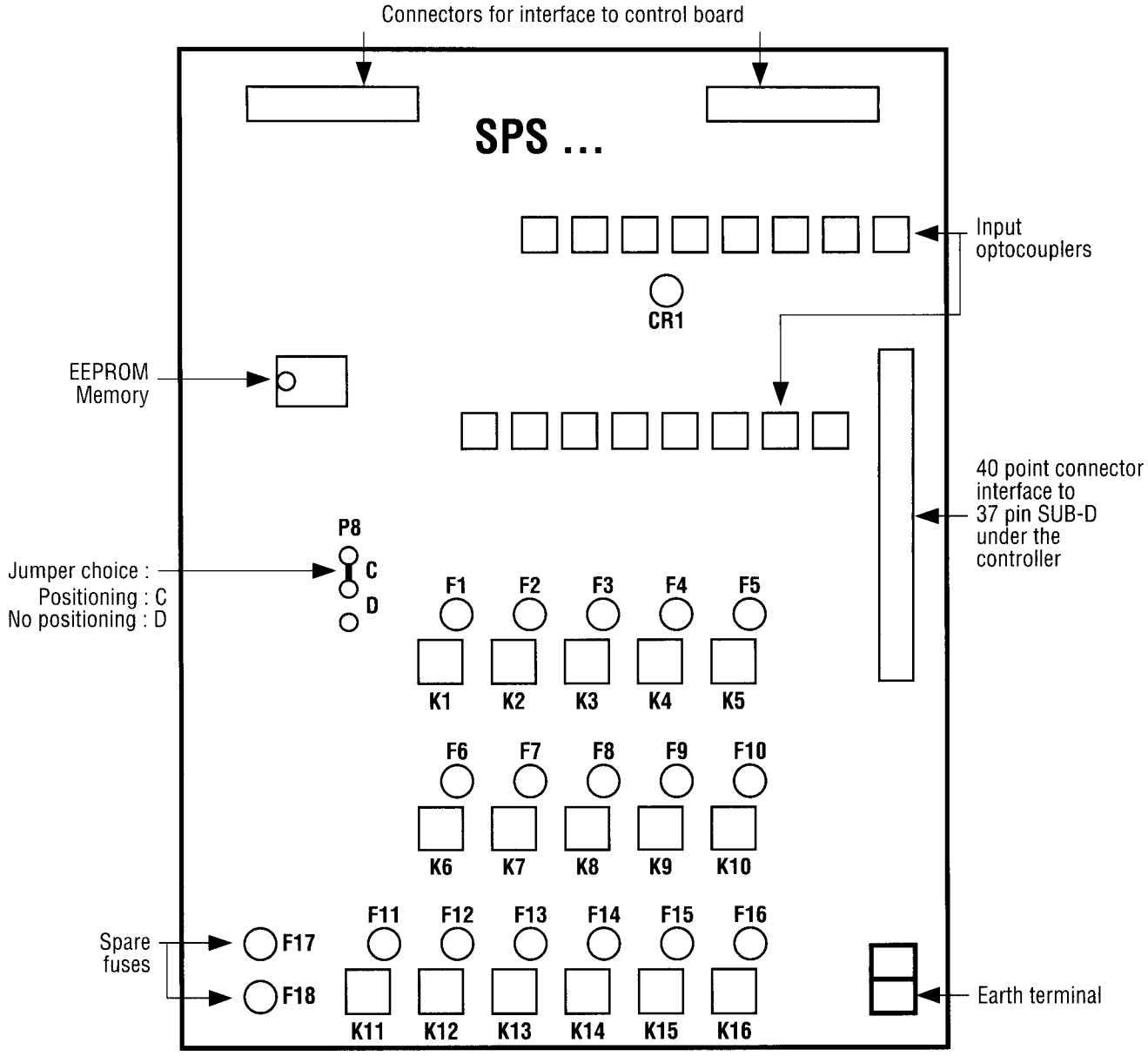
They are managed in the same way as a system without POSITIONING extension.
If the power supply of the electronic control is not safe-guarded, a reference must be taken when re-setting.

VI - SETTING-UP AND ADJUSTMENTS

A. Setting-up of the extension

Access to the extension board : see procedure described in 1st part § **IV - A. Standard connection.**

The POSITIONING board not represented in paragraph **IV - A 1st part** is located beside the resolver board and is overlaid over the microprocessor control board. The validation or invalidation of the extension is carried out by jumper on the board.



K1 to K8 : static relays of outputs 01 to 08
K9 : static relay of output OP
K10 : static relay of output Oval
K11 : static relay of output Ref OK
K12 : static relay of output Ready
K13 to K16 : static relays of outputs OC1 to OC 4
F1 to F16 : protection fuses of static relays K1 to K16

The jumper P8 can be moved when the modulator is switched on.

Figure 15 : Positioning extension diagram

B. Programming of the board

STANDARD

SMV **NP** 3030
MOT **71 M 30 C**
FREIN BK **18**
T acc/dec --,-- S
T stop --,-- S
T securit --,-- S
N max -- -- min $^{-1}$
I max **--- A**
Stabilité **1.0**
Perf. dynam. **6**

Ch. B	Sort. V/I ?	**I**
Ch. C	Red. auto. ?	**N**
Ch. D	Ired J4/5 ?	**0**
Ch. E	Th. Res x	**1**

Incrémental

Nb. incréments **8**
I001 ------,-- mm
'
'
'
'
'
'
'
I008 ------,-- m

POSITION

Init. système

Incr/Abs.		**A**
Dem	---,---	mm/tr
Vmax	---,-	mm/s
Vit. =	% V max ?	**0**
Vred	----,-	mm/s
** But 1	------,--	mm
** But 2	------,--	mm
** Deca	------,--	mm
Fpts	--,--	mm
Signe axe OK ?		**O**
Utilis. frein ?		**N**
Apprent. ref ?		**N**
Apprent. pos ?		**N**

Régl positions

Absolu ≤ 8

Nb. groupes **O**
Nb. positions **8**
P001 ------,-- mm
'
'
'
P008 ------,-- mm

Indic. zones

Nb. zones **4**
Zone 1
B1 Z1 ------,-- mm
B2 Z1 ------,-- mm
sens Z1 B1 ⟶ B2
VZ1 ----,- mm/s

MEASURE

Version C - 0/21

** P réf.	------,--	mm
** P axe	------,--	mm
Err	------,--	mm
V axe	------,--	mm/s
N mot.	----	min^{-1}
I mot.	---	A
Utilis. mot.	---	%
Dsmv	-- -- -- --	
Dpos.	-- -- -- --	
Ent. 1	----------	
Ent. 2	----------	
Sor. 1	----------	
Sor. 2	----------	
Ecart 0	----	pts

Absolu > 8

Nb. groupes **5**
Groupe 1
de P000 à P**xxx**
P000 ------,-- mm
Pas ------,-- mm
Groupe 2
de Pxx(x+1) à P**yyy**
Pxx(x+1) ------,-- mm
Pas ------,-- mm

Indic. zones

Nb. zones **4**
Zone 1
B1 Z1 ------,-- mm
B2 Z1 ------,-- mm
sens Z1 B1 ⟶ B2
VZ1 ----,- mm/s

** Does not appear for an incremental mode positioning.

1. Programming method

- Carry out the "STANDARD" adjustments as indicated in the first part.
- Move to "POSITION" mode
- Answer each of the questions **FOLLOWING THE SET ORDER** :
  - Init. system
  - Adjustments of positions
  - Zone indicators

Note : you will only have access to the writing mode if you satisfy 2 conditions :
- jumper on resolver board in position F
- IN/P input set to 1 → parameter modification

2. "STANDARD" adjustments

Same procedure as for a controller without POSITIONING extension.

3. "POSITION" Adjustments

I	n	i	t	.	S	y	s	t	e	m					

a. Positioning mode

I	n	c	r	.		/		A	b	s	.		?		**A**

I : Incremental mode : movement programming = revolution movements.
A : absolute mode : movement programming of positions referenced with respect to an origin according to 2 procedures :
- at most 8 positions,
- more than 8 positions.

b. Conversion factor

D	e	m		**0**	**1**	**8**	.	**2**	**8**	**5**	m	m	/	t	r

"Dem" fixes the reduction ratio in millimeters of mobile movement per revolution of SMV motor = definition of the drive train.
Note :
All the position, increment and end-stop values including the shift are included between
- 5242 x dem and
+ 5242 x dem.

c. Linear speed of mobile movement

V	m	a	x			**1**	**3**	**2**	**4**	.	**3**	m	m	/	s

For all positionings, the systems tries to reach the final position within the shortest time. Vmax is the maximum speed limit of the movement. It is common to all the POSITIONING extension functions.

d. Analogue speed limitation function

V	i	t	.		=		%	V	m	a	x		?		**0**

For an "O" setting, the speed is limited by the analogue inputs "Ref -", "Ref +".
For the opposite setting, these inputs are not considered.

e. Reduced speed

V	r	e	d		**0**	**0**	**1**	**0**	.	**0**		m	m	/	s

The reduced speed is used :

- when in manual position set-up mode inputs I + I – activated,
- when taking references,
- when the IR speed reduction input is activated.

It cannot be greater than 1/5th of the maximum speed.

f. Software end-stops : end-stop 1, end-stop 2

B	u	t	1		**+**	**1**	**0**	**0**	**0**	**0**	.	**0**	**0**	m	m

"But 1" and "But 2" (end-stop 1 and end-stop 2) do not appear in the incremental mode.
At these stops, the system stops and is regulated in position.
End-stop 1 and end-stop 2 are not changed by the "Deca" (shift) parameter.

g. Origin shift

D	e	c	a		**-**	**0**	**0**	**0**	**2**	**8**	.	**0**	**0**	m	m

"Deca" (shift) does not appear in the incremental mode.
"Deca" (shift) is accessible whatever the position of the jumper on the Resolver board and the state of the IN/P input.

"Deca" (shift) is limited and signed.

This parameter is such that all positions defined from the origin Og modified by the shift, cannot go outside of the software end-stops.

Example :
- But 2 = + 10 000 mm
- all position distances are smaller or equal to + 9 500 mm
- Deca cannot exceed + 500 mm

h. Position window around point

F	p	t	s	.				0	3	.	0	0	m	m

The window around the stop point defines the distance's tolerance at which the position is estimated as reached. The window must be greater than the precision which the drive train with the SMV can achieve.

i. Orientation of the positioning axis

S	i	g	n	e		a	x	e		o	k		?		0

Allows inversion of the sign of all the positions with respect to the one previously chosen ("O").
The position remains physically the same.

j. Use the brake for positioning

U	t	i	l	i	s	.		F	r	e	i	n	?		0

When positioning with a mechanical system with a large play, the brake release command can be given ("O") when the system enters into the position window.
The coming on of the brake is managed by the microprocessor.

k. Reference initialization

A	p	p	r	e	n	t	.		r	e	f	.	?		0

Reference can be initialised via keyboard control or remotely via input I0.
The first reference taken when setting-up the system, must be set via the keyboard by "apprent. ref." (Manual position set-up).
After validating "O", the mobile is moved by the 2 inputs I+ and I-.
Set "N" when the reference is taken to get out of the manual position set-up mode using inputs I+ and I-.

l. Manual position set-up

A	p	p	r	e	n	t	.		p	o	s	.	?		N

O : validate this function when setting-up the system.
Manual position set-up is carried out by keeping I+ and I- set.

R	e	g	l	.		P	o	s	i	t	i	o	n	s	

Incremental mode : Incr/Abs = I

m. Definition of increments

N	b	.	I	n	c	r	e	m	e	n	t	s		5	

The maximum number is 8.

I	0	0	4		-	0	0	2	0	0	.	0	7	m	m

Each increment is associated to an input :
I004 = I4, it can be positive or negative.

Absolute mode : Incr/Abs = A

n. Definition of positions

N	b	.	g	r	o	u	p	e	s		:			4	

At most 17 groups

• Number of groups = 0, programming of 8 positions at the most.

N	b	.	P	o	s	i	t	i	o	n	s		7		

P	0	0	6		+	1	2	0	0	0	.	0	0	m	m

Each position is associated to an input :
P006 = I6

• Number of groups > 0 : programming of groups of positions characterized by a constant step between each position.

		G	r	o	u	p	e					3			

d	e		P	.	1	4	1		à		P	.	1	9	3

P	1	4	1		-	0	1	2	2	4	.	0	0	m	m

P	a	s			+	0	0	0	9	5	.	0	0	m	m

Group 2 therefore stops at P 140
141 is automatically displayed
P 141 : 1st position of the group : its origin
P 193 : last position of the group : smaller or equal to 255.

I	n	d	i	c	.		z	o	n	e					

Only appears in absolute mode

o. Definition of zones

N	b	.	z	o	n	e	s							**4**
z	o	n	e		3									
B	1	Z	3		**+**	**1**	**8**	**0**	**0**	**0**	.	**0**	**0**	m	m
B	2	Z	3		**+**	**2**	**8**	**0**	**0**	**0**	.	**0**	**0**	m	m
S	e	n	s		Z	3		B	1		→		B	2	
V	Z	3				**0**	**2**	**1**	**0**	.	**0**	m	m	/	s

- Maximum of 4 programmable zones
- B1 Z3 - B2 Z3 : boundaries of zone 3
- Direction Z3 defines the direction of zone 3 travel for which speed is limited to VZ3

Possibility
B1 → B2
B1 ← B2
B1 ↔ B2

4. "Measure" mode
a. SMV version

V	e	r	s	i	o	n			C	-	0	/	2	1	

material version

year
0 : 1990
5 : 1995

software version week in the year marketed.

To be specified when calling for service.

b. "P ref"

Does not appear in incremental mode.
The display of reference position requested by the programmable logic controller, corresponds to the decoding of the position's inputs to get the corresponding values stored in the SMV memory.

c. "P axe" (P axis)

Does not appear in incremental mode.
Display of the actual mobile's position on the axis with respect to the Og origin.

d "Err"

This value is signed and corresponds to the difference between the movement requested and the movement carried out or between the position requested and the position attained.

e. "V axe" (V axis)

Actual linear travel speed along the transfer axis in mm/s.

f. "N mot"

Actual motor speed in min^{-1}(rpm).

g. "I mot"

Current absorbed by motor in A.

h. "Utilis. mot" (mot usage)

Motor usage rate : thermal image of the system in % of the allowed limit.

j. "D smv" - "D pos"

Diagnosis aid.

Codes corresponding to the key software steps made by the microprocessor.

"D smv" : concerned with speed controlled SMV.

"D pos" : concerned with the position option.

k. Positioning board Input and Output states

Display of logic states : 0 ou 1

Inputs :

E	N	T	.	1		I1	I2	I3	I4	I5	I6	I7	I8	IP	Ival

E	N	T	.	2		I0		Ired		I+	I-		IN/P		Ref

Outputs :

S	O	R	.	1		O1	O2	O3	O4	O5	O6	O7	O8	OP	Oval

S	O	R	.	2			Oc1	Oc2	Oc3	Oc4		ready		Ref OK	

l. Difference between resolver zero and axis zero

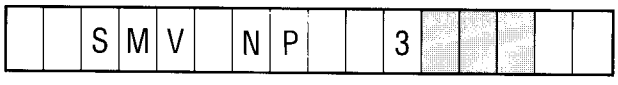
"Ecart 0" (0 difference) varies between - 2048 and + 2048.
It represents the difference between the resolver zero and the axis zero in points. 4096 points = 1 resolver revolution.
In order to avoid errors of 1 resolver revolution between 2 reference initializations, the sensor must be installed on the axis to allow a "0 difference" between -2048 and -1000 or between +1000 and +2048.

E	c	a	r	t		0		+	1	1	2	2	p	t	s

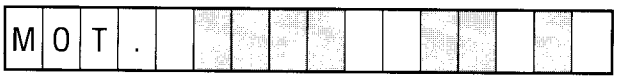
Appendix : PROGRAMMING THE CONVERTER

"STANDARD" ADJUSTMENTS

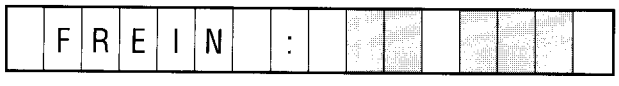
Definition of electronics



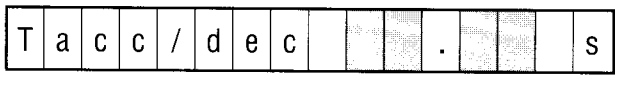
Motor



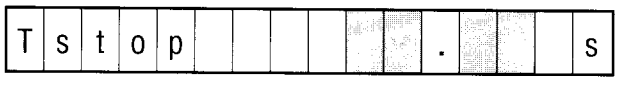
Brake



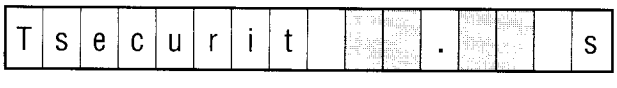
Acceleration, deceleration



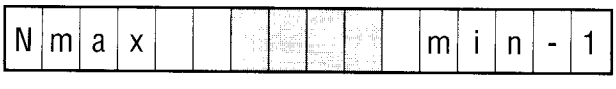
Stop ramp



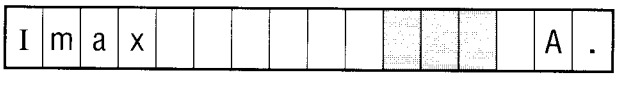
System securities



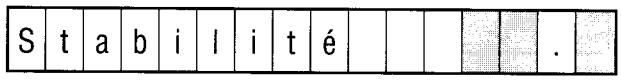
Maximum speed



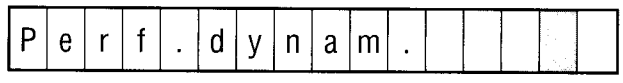
Current limitation



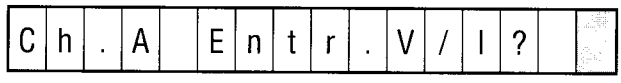
Stability



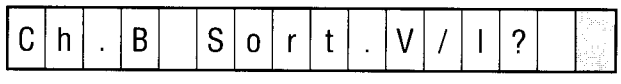
Dynamic performances **definition**



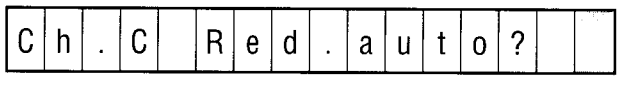
Reference choice (speed or torque)



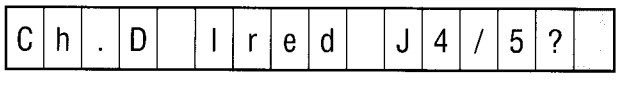
Programming of J4/4 terminal of the terminal block



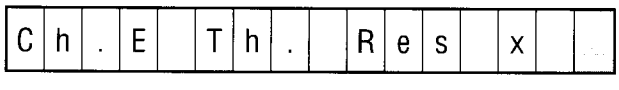
Automatic restarting



Torque reduction via the terminal block



Resistance box



"POSITION" ADJUSTMENTS

INCREMENTAL POSITIONING MODE

Init.System

Positioning mode

Incr. / Abs. ?

Conversion factor

Dem . mm/tr

Linear speed of mobile movement

Vmax . mm/s

Analogue speed limitation function

Vit. = %Vmax ?

Reduced speed

Vred . mm/s

Position window around point

Fpts . mm

Orientation of the positioning axis

Signe axe ok ?

Use the brake for positioning

Utilis. Frein ?

Positions

Number of increments

I001 - . mm

I002 - . mm

I003 - . mm

I004 - . mm

I005 - . mm

I006 - . mm

I007 - . mm

I008 - . mm

"POSITION" ADJUSTMENTS

ABSOLUTE POSITIONING MODE : 8 at the most

Init. System

Positioning mode

Incr. / Abs. ?

Conversion factor

Dem . mm/tr

Linear speed of mobile movement

Vmax . mm/s

Analogue speed limitation function

Vit. = %Vmax ?

Reduced speed

Vred . mm/s

Software end-stops : end-stop 1, end-stop 2

But1 . mm

Software end-stops : end-stop 1, end-stop 2

But2 . mm

Origin shift

Deca . mm

Position window around point

Fpts . . mm

Orientation of the positioning axis

Signe axe ok ?

Use the brake for positioning

Utilis. Frein ?

Positions

Nb. groupes :

Nb. Positions

P001 . mm

P002 . mm

P003 . mm

P004 . mm

P005 . mm

P006 . mm

P007 . mm

P008 . mm

"POSITION" ADJUSTMENTS

ABSOLUTE POSITIONING MODE : at least 9

Init.System

Positioning mode

Incr. / Abs. ?

Conversion factor

Dem . mm/tr

Linear speed of mobile movement

Vmax . mm/s

Analogue speed limitation function

Vit. = % Vmax ?

Reduced speed

Vred . mm/s

Software end-stops : end-stop 1, end-stop 2

But1 . mm

Software end-stops : end-stop 1, end-stop 2

But2 . mm

Origin shift

Deca . mm

Position window around point

Fpts . . mm

Orientation of the positioning axis

Signe axe ok ?

Use the brake for positioning

Utilis. Frein ?

Number of groups

Nb.groupes : 5

Groupe 1

de P. à P.

P . mm

Pas . mm

Groupe 2

de P. à P.

P . mm

Pas . mm

Groupe 3

de P.000 à P.

P000 . mm

Pas . mm

Groupe 4

de P. à P.

P . mm

Pas . mm

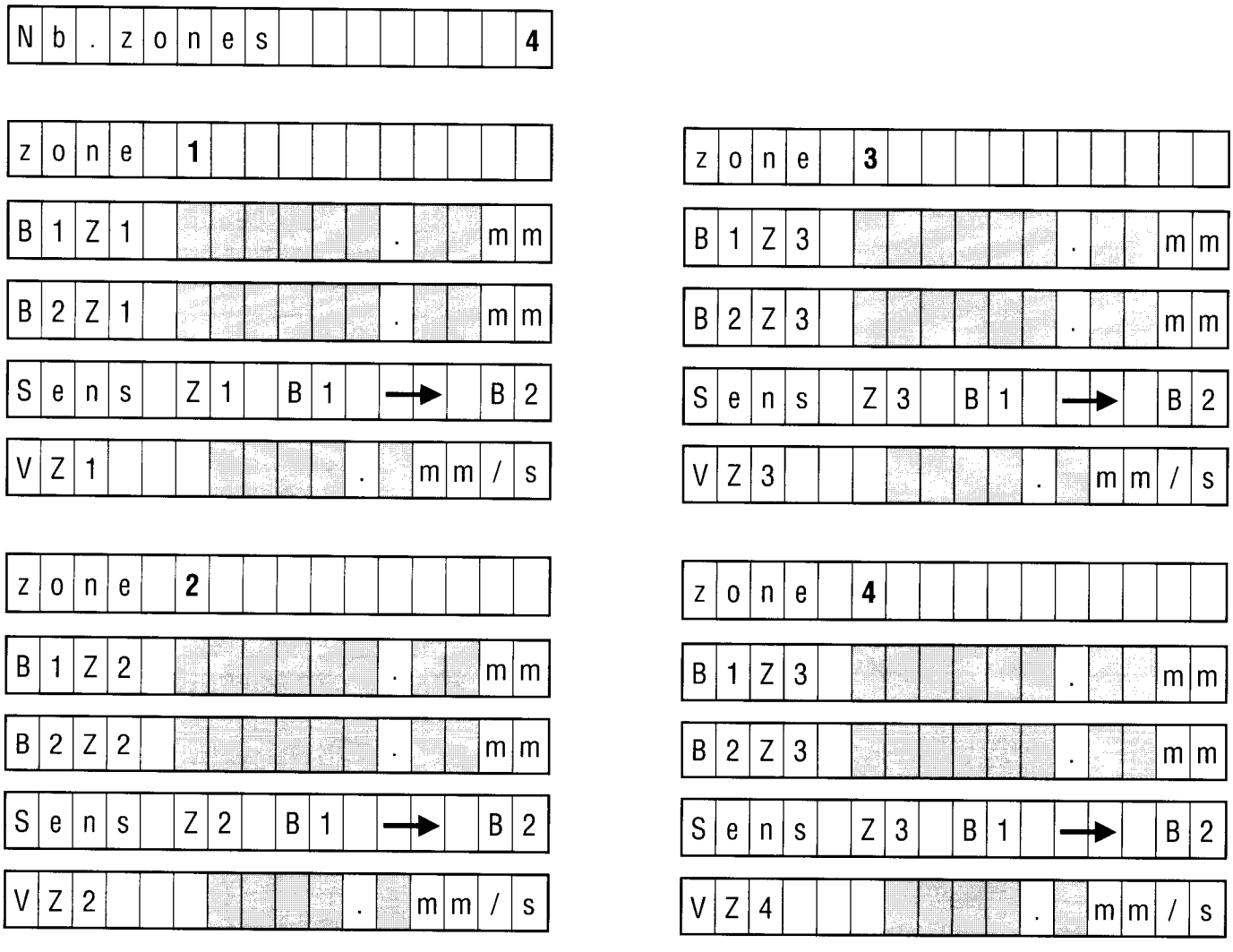
Groupe 5

de P. à P.

P . mm

Pas . mm

ZONES


Nb. zones 4
zone 1
B1Z1 .mm
B2Z1 .mm
Sens Z1 B1 → B2
VZ1 .mm/s
zone 2
B1Z2 .mm
B2Z2 .mm
Sens Z2 B1 → B2
VZ2 .mm/s
zone 3
B1Z3 .mm
B2Z3 .mm
Sens Z3 B1 → B2
VZ3 .mm/s
zone 4
B1Z3 .mm
B2Z3 .mm
Sens Z3 B1 → B2
VZ4 .mm/s

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