

**Operrating Instructions For
Electric Axis MFX/A**

Document:

Machine Model:

CM 2000 NT

Serial number/Year:

30.96.CM.08.0

Customer::

Orange Container

Manufacturer::



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MFX OPERATING INSTRUCTIONS FOR
ELECTRIC AXIS

1. INTRODUCTION

The present document gives all necessary information to install MFX control card and the respective operator interface module.

The following chapters report the necessary information to wire connectors and to configure the parameters necessary to start the machine up.

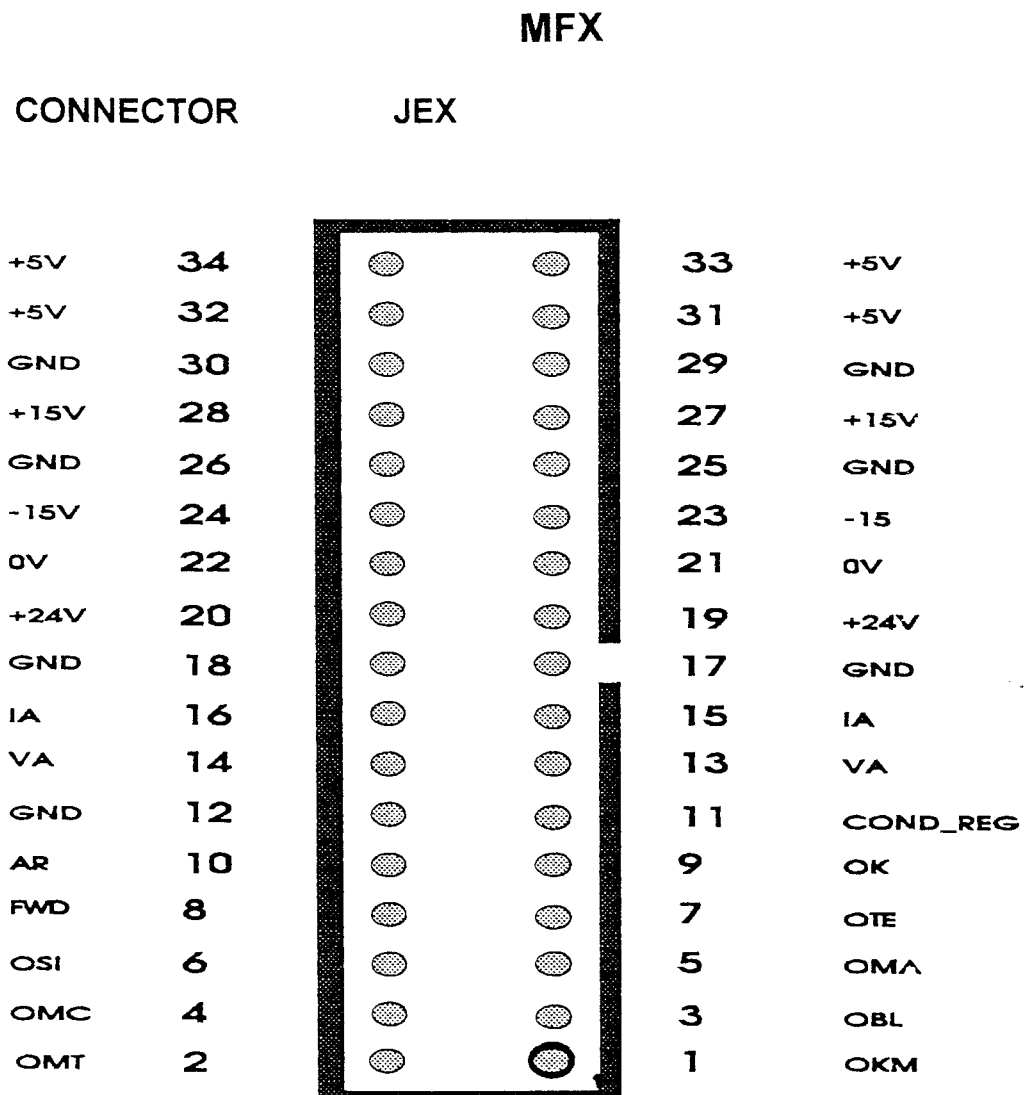
The appendix reports the information relating to the use of the operator interface card (Z90).

2. CONNECTIONS

2.1 CONNECTOR JEX

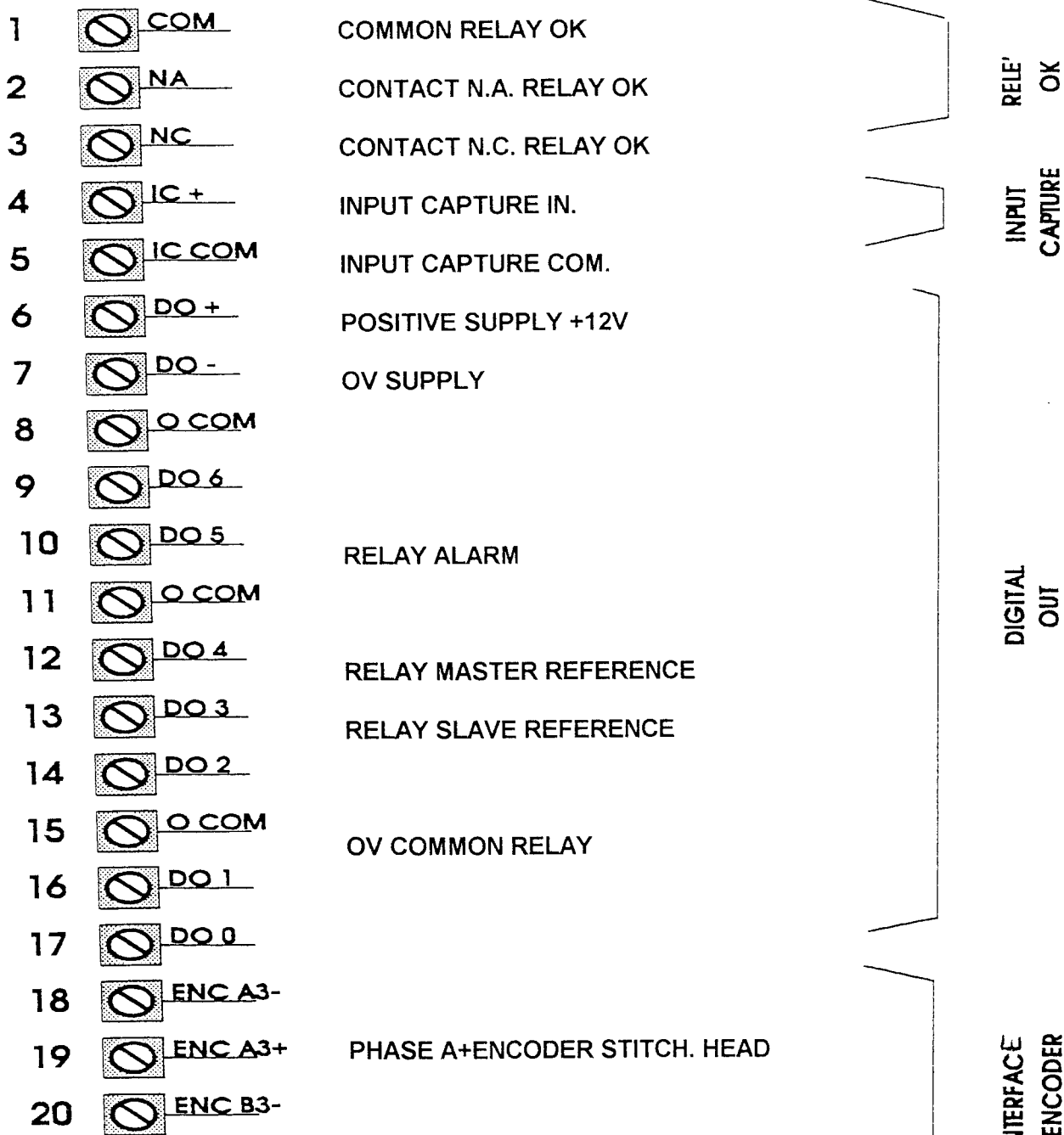
Check that MFX card is connected to driving gear; to this purpose, connector JEX is used, whose task is to supply power to the card and to report driving gear diagnostic signals.

These signals are shown in the following picture:























2.2 TERMINAL BOARD

The following pictures show the connections to be performed on MFX card terminal board.



MFX TERMINAL BOARD M1 (to be continued)

terminal board description follows:





















21		ENC B3+	
22		ENC COM	
23		ENC A2-	
24		ENC A2+	PHASE A+ ENCODER SLAVE
25		ENC B2-	
26		ENC B2+	PHASE B+ENCODER SLAVE
27		ENC COM	ENCODER MASTER/SLAVE SCREEN
28		ENC A1-	
29		ENC A1+	PHASE A+ENCODER MASTER
30		ENC B1-	
31		ENC B1+	PHASE B+ENCODER MASTER
32		ENC COM	ENCODER SCREEN
33		ENC +	POSITIVE SUPPLY ENCODER
34		ENC -	0V SUPPLY ENCODER
35		I COM	0V
36		DI 11	
37		DI 10	CORR. SIGN (close=+1, open=-1)
38		DI 9	CLOSE=RUN, OPEN=STOP
39		I COM	0V
40		DI 8	

INTERFACE
ENCODER

DIGITAL
IN

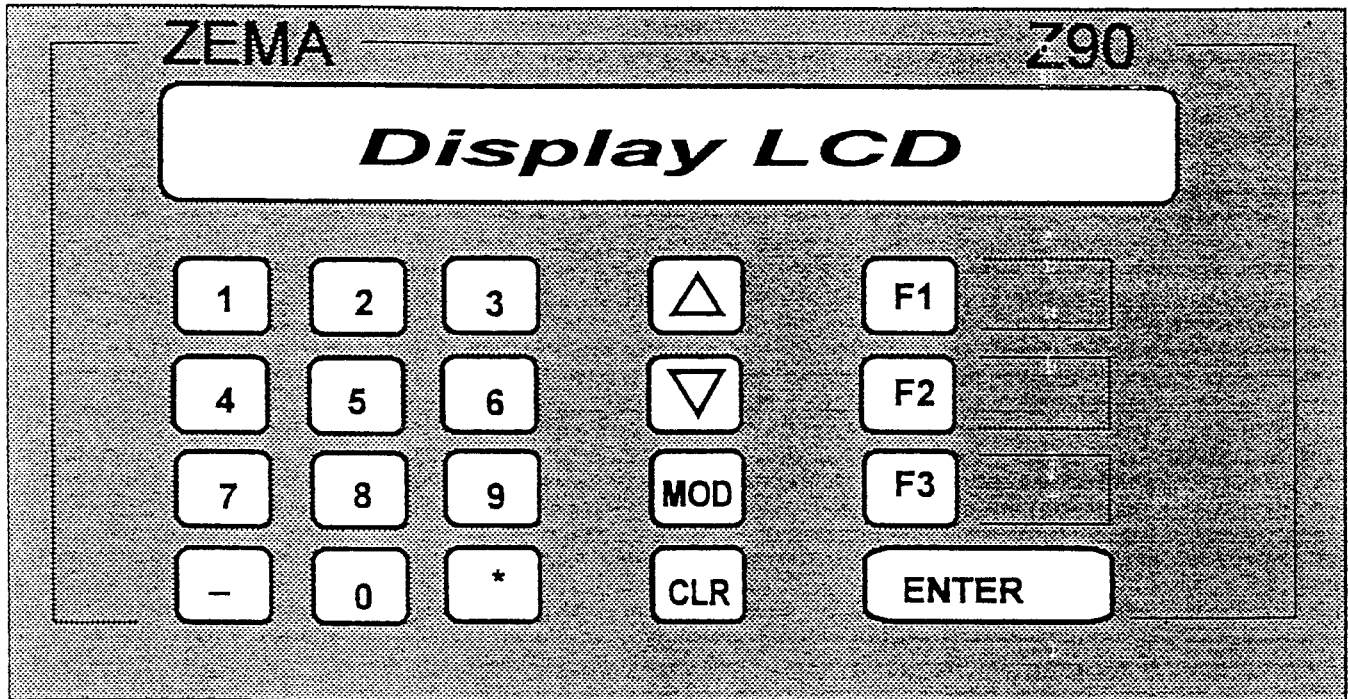
TERMINAL BOARD M1 (to be continued)

terminal board description follows:

41		DI 7	OUTPUT BLOCK	DIGITAL IN
42		DI 6	FAN	
43		I.COM	0V	
44		DI 5	THERMAL PLATE	
45		DI 4	OVERLOAD	
46		DI 3	FUSES	
47		I.COM	0V	
48		DI 2	CHAIN PULSES / ERROR ZEROING	
49		DI 1	FORWARD FEEDING	
50		DI 0	BACKWARD FEEDING	
51		AI 1+	ANALOG IN	
52		AI 1-		
53		SHIELD		
54		AI 0+		
55		AI 0-		
56		AO.COM	ANALOG OUT	
57		AO 1+		
58		SHIELD		SCREEN SUPPORT
59		AO.COM		0V BIDIRECTIONAL REF.
60		AO 0+		BIDIRECTIONAL REF.

TERMINAL BOARD M1 (end)

OPERATOR CONTROL PANEL



3. PARAMETERS CONFIGURATION

3.1 PRELIMINARY OPERATIONS

Supply power to MFX card.

After a few seconds, the following writing will appear on the Z90 keyboard built-in display:

MFX ZEMA 94

3.2 OPERATOR INTERFACE

The operator interface, realized by means of keyboard Z90, allows the following operations:

- Display
- Diagnostic indications
- Encoder test

How to use the keyboard follows on the next page.

3.2.1 DISPLAY

The operator can read all information relating to the machine arrangement and state on a display.

KEY F1

- Adjustment visualized by the electric axis on SLAVE motor
- State of the automatic device managing the electric axis. Down here, you can find meaningful value for the user:
 - 1 - OFF state;
 - 3 - CHAINS running;
 - 4 - CHAINS forward;
 - 5 - CHAINS backward;
 - 7 - MASTER recovery;
 - 8 - SLAVE recovery;
 - 9 - Electric axis;
 - 10 - FORWARD feeding;
 - 11 - BACKWARD feeding;
 - 12 - STOP wait (since RUN appears);
 - 13 - FAIL (presence of alarms);
 - 14 - EMERGENCY;
 - 15 - Max. error (superior to 90°);
 - 17 - Adjustment only in a direction (forward);

Errors between MASTER motor and SLAVE motor are expressed by the number of difference encoder pulses. A positive number shows that MASTER motor is in advance with reference to SLAVE motor, a negative number shows the opposite.

- DIGITAL IN 0 EA FORWARD/FORWARD FEEDING;
- DIGITAL IN 1 EA BACKWARD/BACKWARD FEEDING;
- DIGITAL IN 3

To visualize these values, it is necessary to press key F1 and then scroll the visualized values by means of ARROWS UP and DOWN.

KEY F2

The system is provided for the visualization of a certain number of failures and anomalies.

- DIGITAL IN 3 ALARM FUSES;
 - DIGITAL IN 4 ALARM OVERLOAD;
 - DIGITAL IN 5 ALARM THERMAL PLATE;
 - DIGITAL IN 6 ALARM FAN;
 - DIGITAL IN 7 ALARM LOCK OUTPUT;
 - DIGITAL IN 8 not used;
 - DIGITAL IN 9 closed=RUN, open=STOP;
 - DIGITAL IN 10 closed=corr.+1, Open = -1;
 - DIGITAL IN 11 not used;
-
- TACHOMETER (MT Control gear);
 - EXIT 2 (MC Control gear);
 - EXIT 1 (BL Control gear);
 - POWER SUPPLY (MA Control gear);
 - I_INSTANTANEOUS (IST Control gear);
 - I_THERMAL (TER Control gear);

To visualize the above-mentioned values, it is necessary to press key F2 and then scroll the visualized values by means of ARROWS DOWN and UP.

KEY F3

Setting the system, for MFX ZEMA 94 only.

To set the system, make use of Key F3. Key F3 is only manageable when the system is OFF, once setting has been concluded, it must be pressed once again to leave the mode and allow the system to pass to electric axis mode.

While setting, SLAVE motor adjustment is not manageable (motors in parallel).

To visualize the information necessary to check that encoders are correctly wired (Master=FWD/REV Slave=FWD/REV) press key F3. The value FWD/REV is visualized only when the encoder is wired and the motor is running. Encoders are correctly wired in case writing M=FWD S=FWD (both motors forward) appears.

By means of ARROWS UP and DOWN, it is possible to visualize SLAVE motor speed percentage excursion with reference to MASTER motor (Speed ratio:). Value 0 shows that SLAVE and MASTER motors run at the same speed; positive values show that SLAVE motor is faster than MASTER motor, negative values show that SLAVE motor is slower than MASTER motor.

The speed ratio is not visualized in case motors run too slow or both do not run forward.

After the system has been set so that the visualized value is as near as possible to 0, it is necessary to stop motors and press key F3 once again to leave setting modality.

4. STARTING UP PROCEDURE

It is advisable for the operator to proceed as follows:

- 1) Press key F3 to perform ENCODER test and speed ratio;
- 2) Press RUN.
 - By means of key F1, check that EA has been adjusted (increase the value of the machine speed by 10% by means of reaction potentiometer (PMX) SLAVE and set out an adjustment of 50 - 70 pulses).
 - Increase the speed by 100% and check that the two connected motors find themselves in state 9 with an error rate of 0 - 1 pulses.
 - By means of pushbutton STOP, check that both motors contemporarely stop with an error rate ranging from 3 to 5 pulses.
- 3) Set the phase between the two motors by means of pushbuttons SLAVE FORWARD.; the motor will run in singles until it reaches the desired position increase, this way, the error rate which will be zeroed once the pushbutton is released at the end of the phase. It is also possible to modify the phase when the machine is running, by means of controls FORWARD and BACKWARD FEEDING.
- 4) ALARM The alarm relay intervenes in the following cases:
 - When errors between the two encoders are superior to 90°;
 - During running in case pulses from one of the two encoders fail;
 - In case one of the two motors does not run after the control has been given.

When phase alarm is present, MFX allows to recover the pulses relating to the stored error and to connect motors to the previous phase again, in case power supply does not fail.