

CHAPTER 5 - Diagrams, exploded views and spare parts

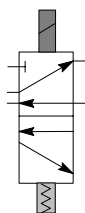
This chapter contains functional diagrams of the machine and exploded views of the COBRA 350 CNC-FE. This document will allow you to identify the location of the various components making up the machine, thus enabling repairs and/or maintenance work to be carried out. In addition, this document will also enable you to order spare parts, correctly identifying them by part number and position number.

5.1 - Diagrams

5.1.1 - Pneumatic diagram

KEY TO COMPONENTS

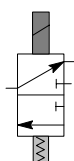
- RPm** = vice pressure regulator
- RT1** = flow regulator (head down)
- EV mt** = Cutting vice and vertical vice solenoid valve
- EV ma** = Feeder vice solenoid valve
- EV t2** = 5/2 head cylinder solenoid valve



Electro-magnetic 5/2 way valve with pressure and spring return



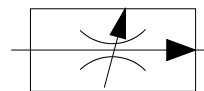
Gauge



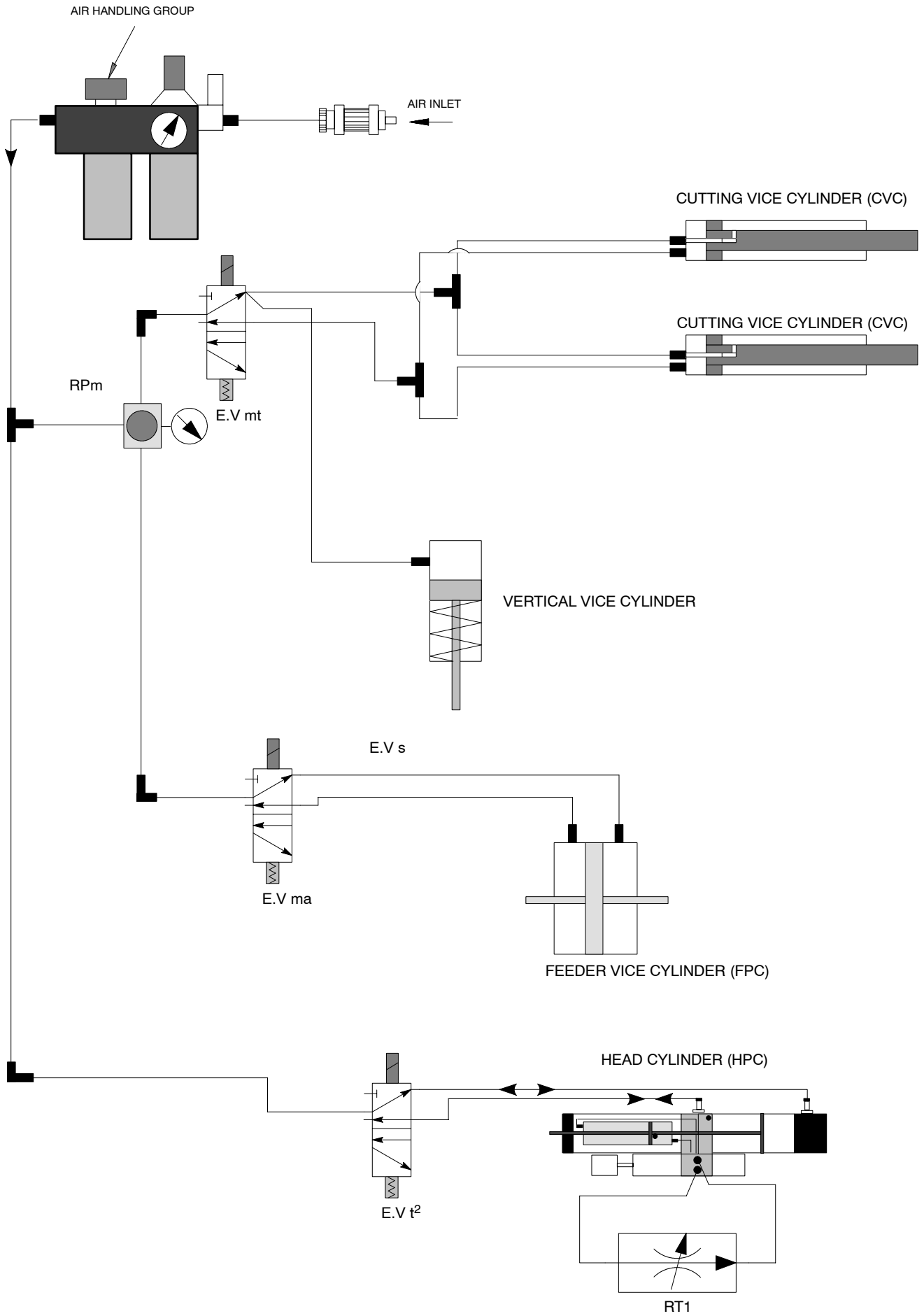
Electro-magnetic 5/2 way valve with pressure and spring return



Compressed air quick fit coupling

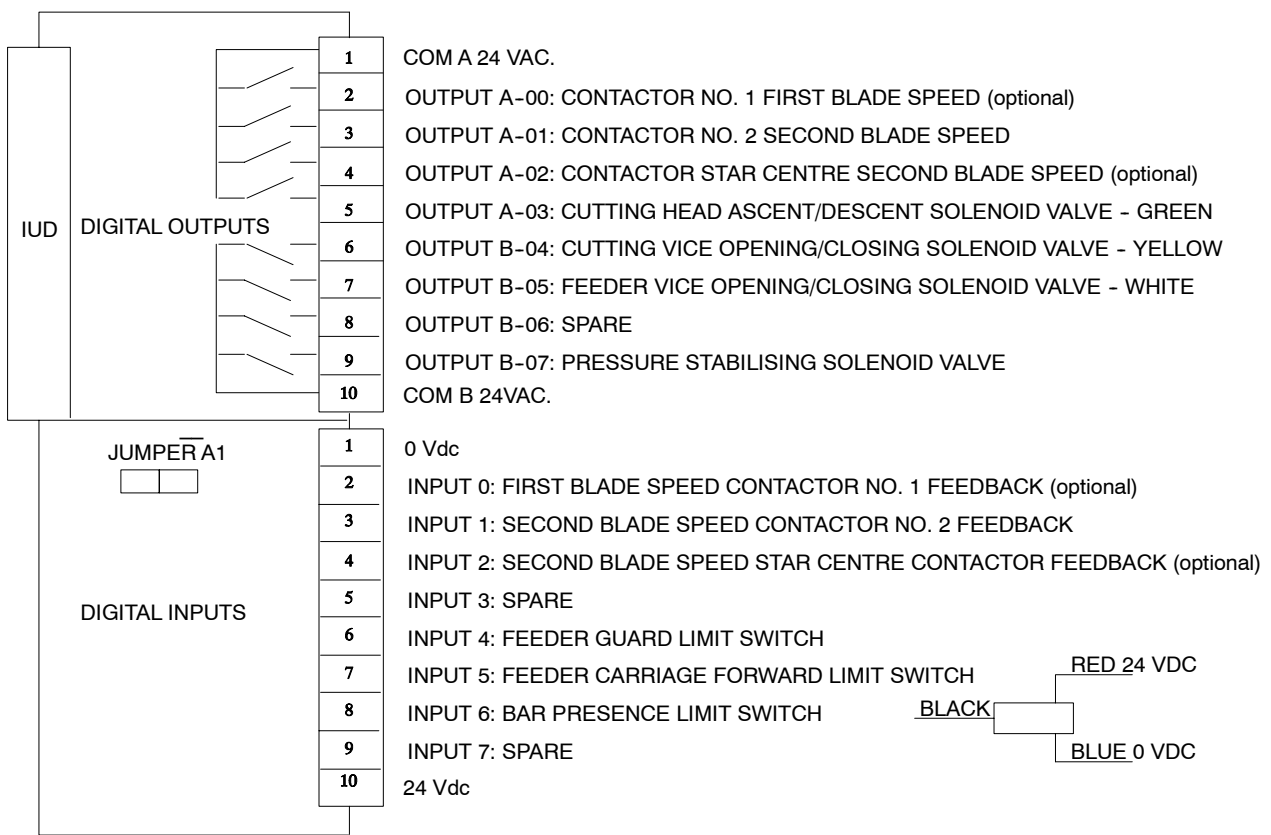


Flow regulator

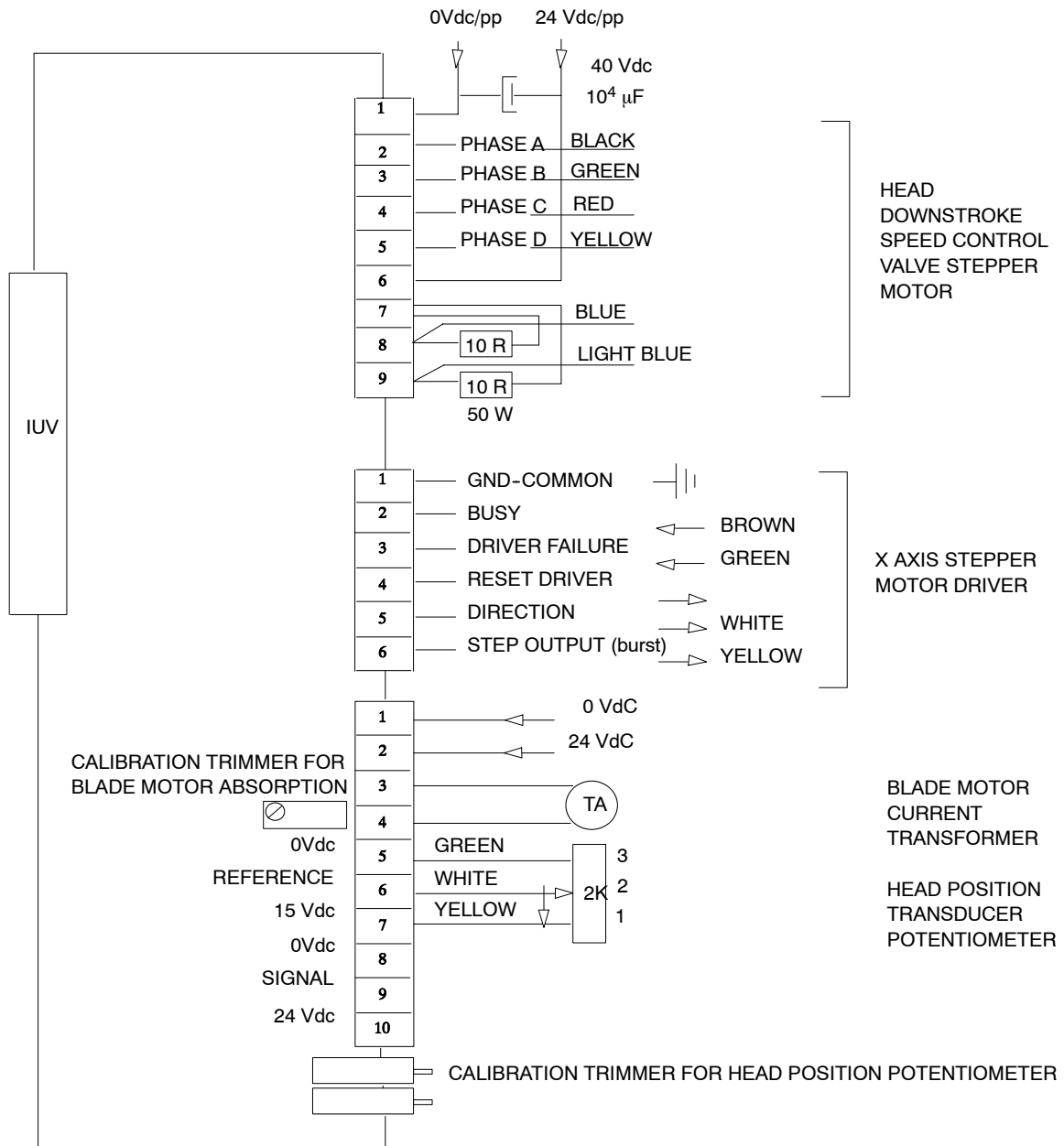


5.1.2 - Electrical diagrams (mnemonic-topographical diagrams)

**LIST OF INPUTS/OUTPUTS FOR COBRA 350 CNC FE
INPUT/OUTPUT CARD**

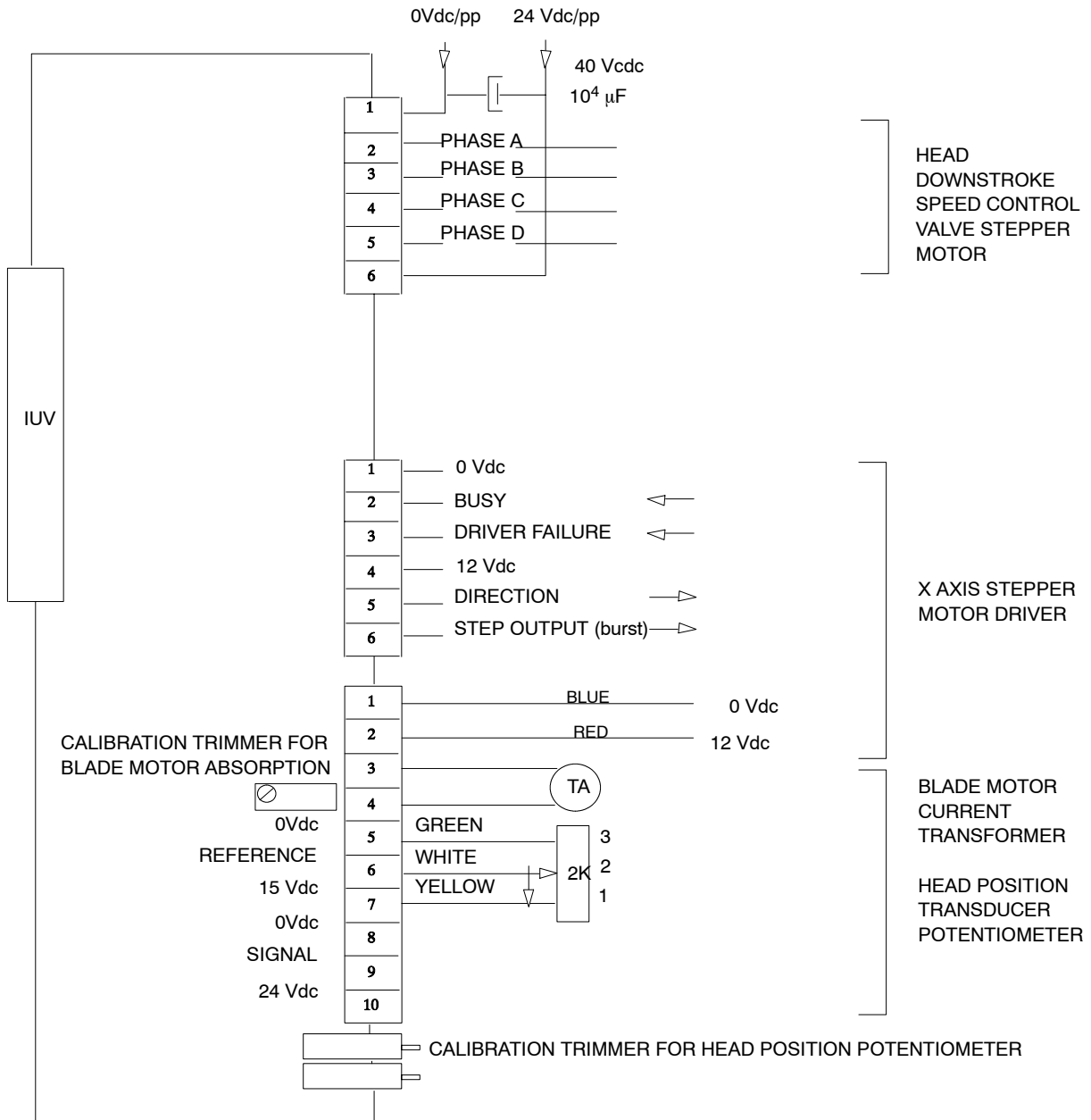


SUNDRY INPUT/OUTPUT CARD (IUV)

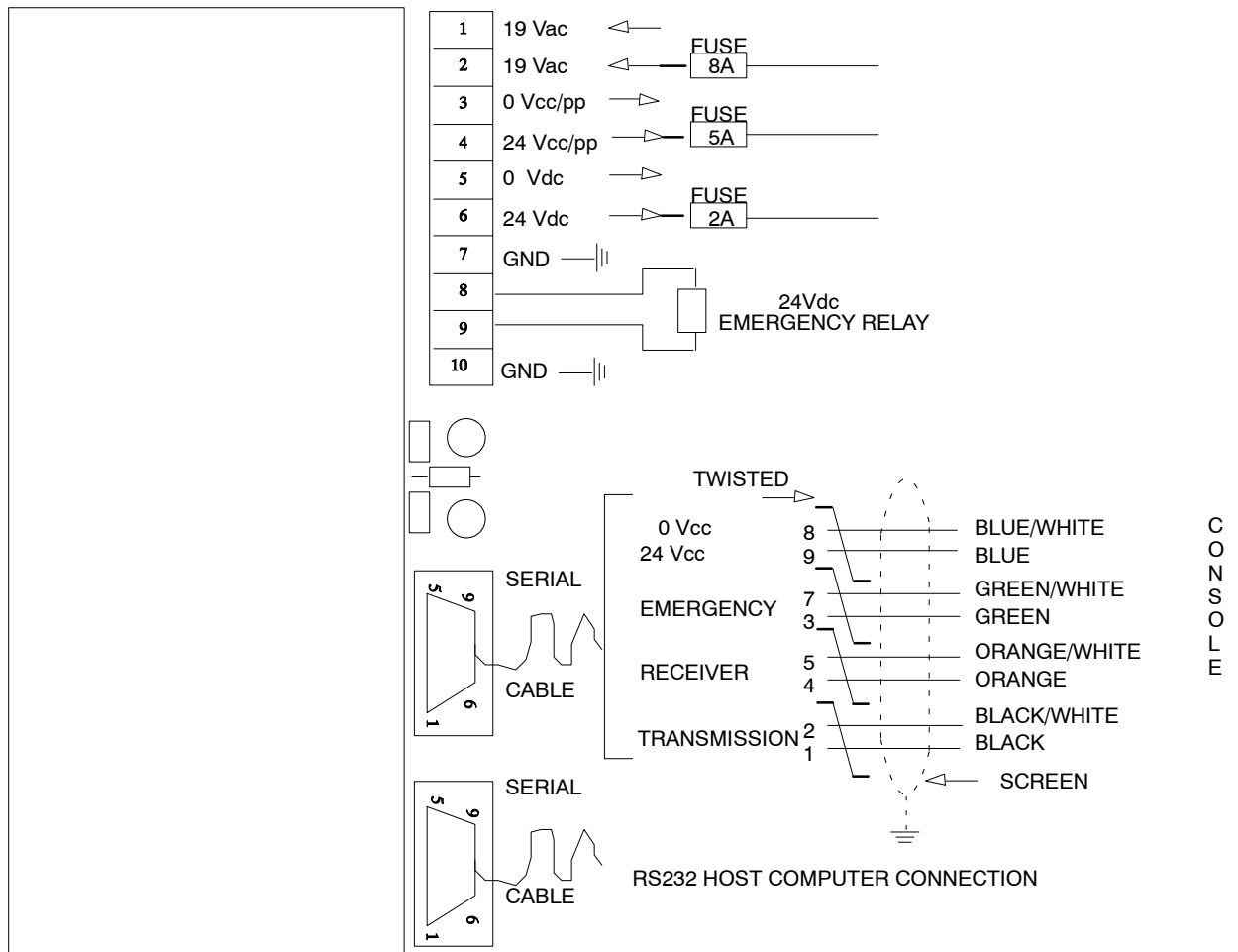


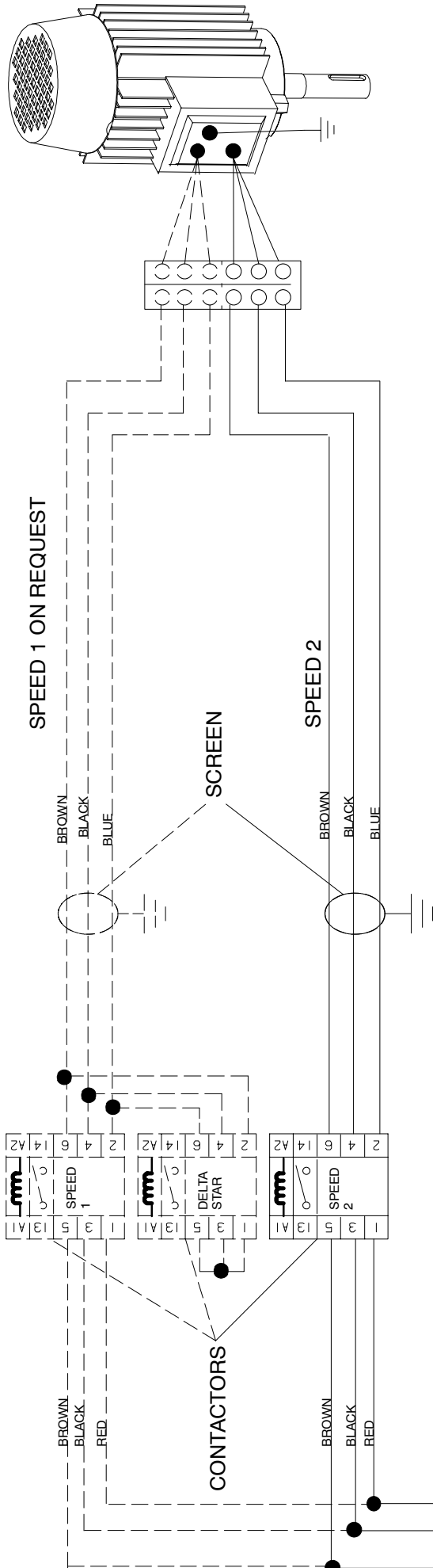
SUNDRY INPUT/OUTPUT CARD

For machines manufactured from January 1995



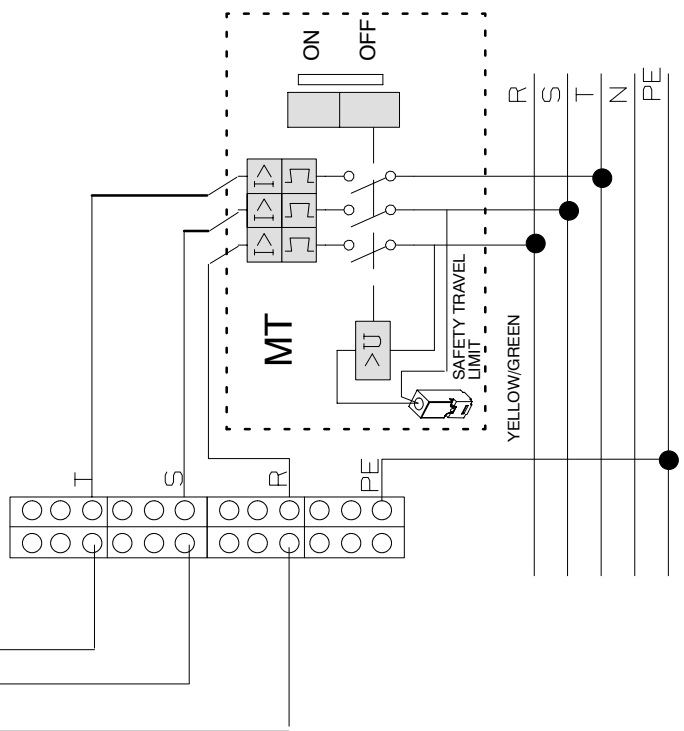
CPU

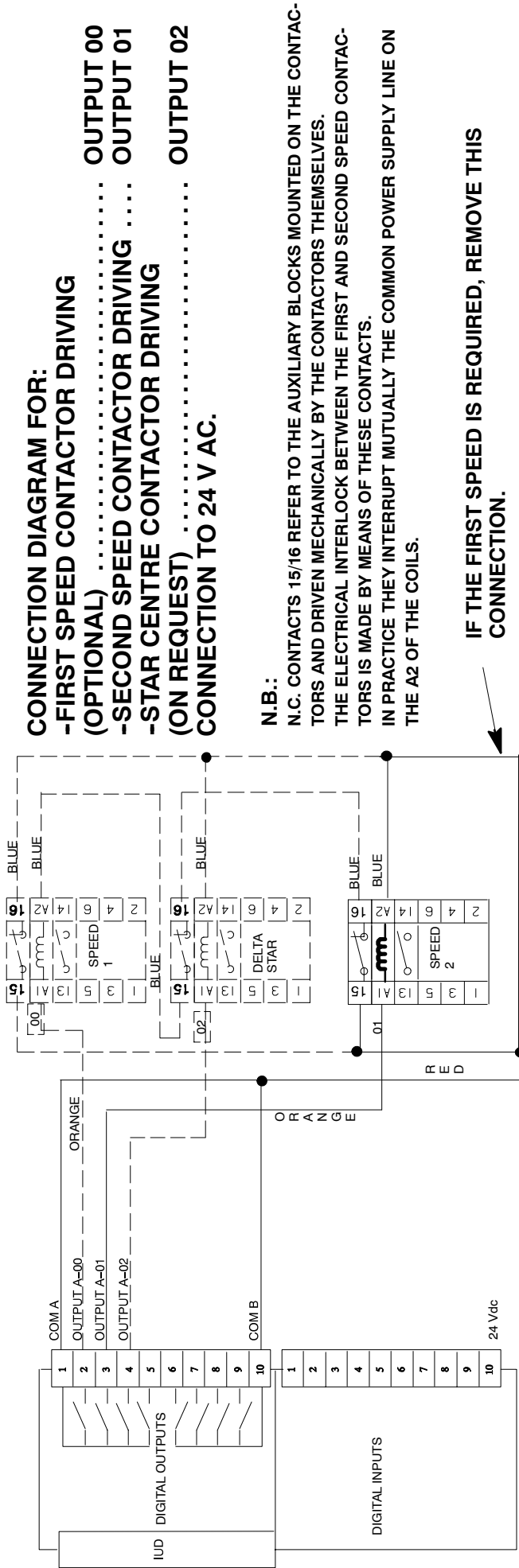




CONNECTION OF SPINDLE MOTOR DRIVING

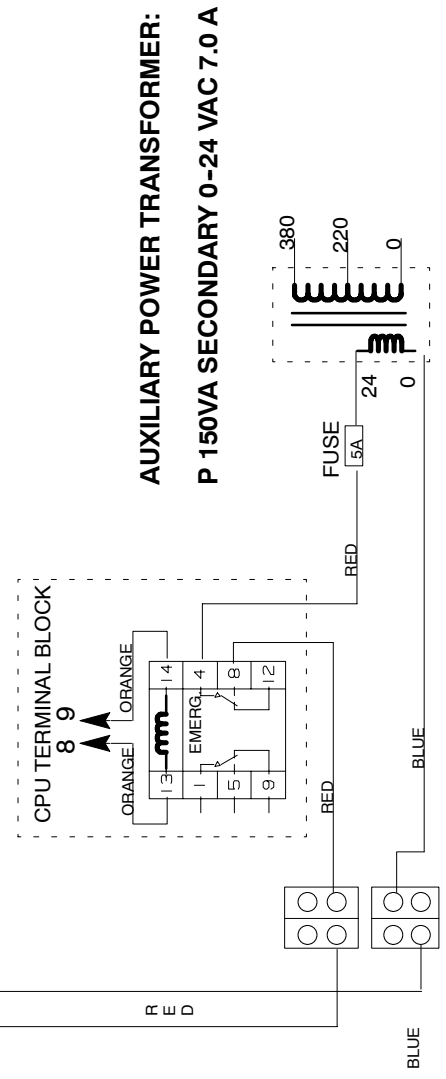
**CONTACTORS TO THREE-PHASE POWER SUPPLY.
POWER CONNECTION DIAGRAM FOR SPINDLE MOTOR TO DRIVING CONTACTORS.**

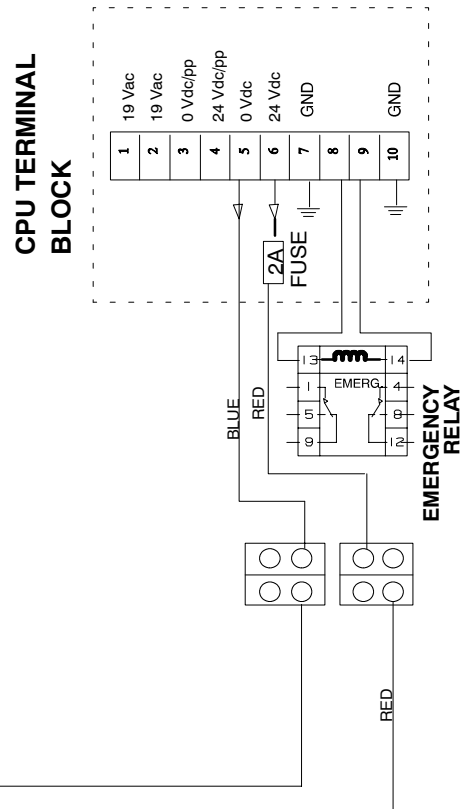
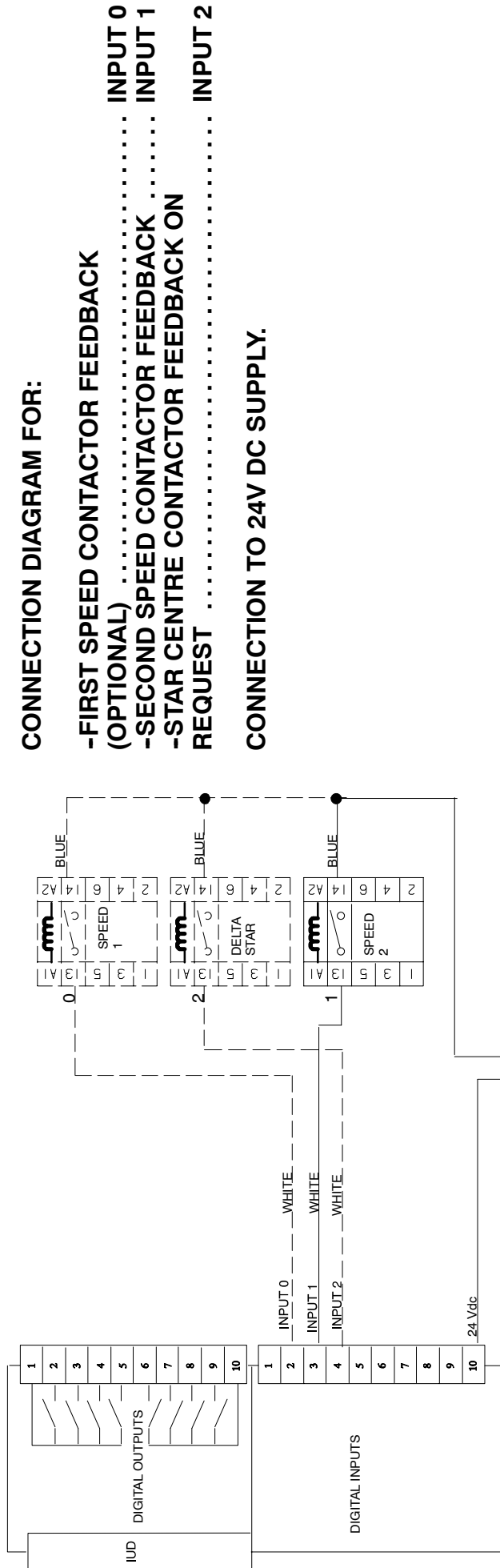




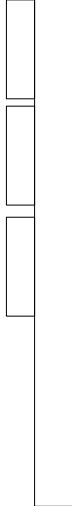

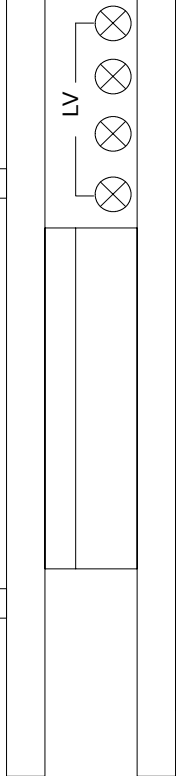
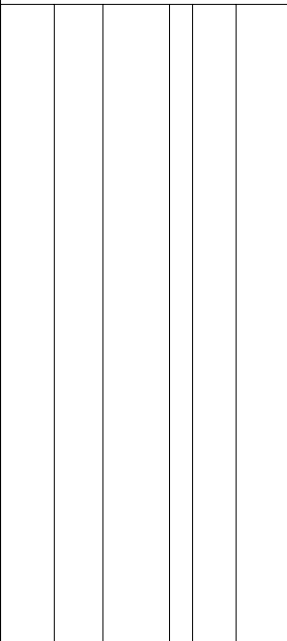
N.B.:
N.C. CONTACTS 15/16 REFER TO THE AUXILIARY BLOCKS MOUNTED ON THE CONTACTORS AND DRIVEN MECHANICALLY BY THE CONTACTORS THEMSELVES. THE ELECTRICAL INTERLOCK BETWEEN THE FIRST AND SECOND SPEED CONTACTORS IS MADE BY MEANS OF THESE CONTACTS. IN PRACTICE THEY INTERRUPT MUTUALLY THE COMMON POWER SUPPLY LINE ON THE A2 OF THE COILS.

IF THE FIRST SPEED IS REQUIRED, REMOVE THIS CONNECTION.

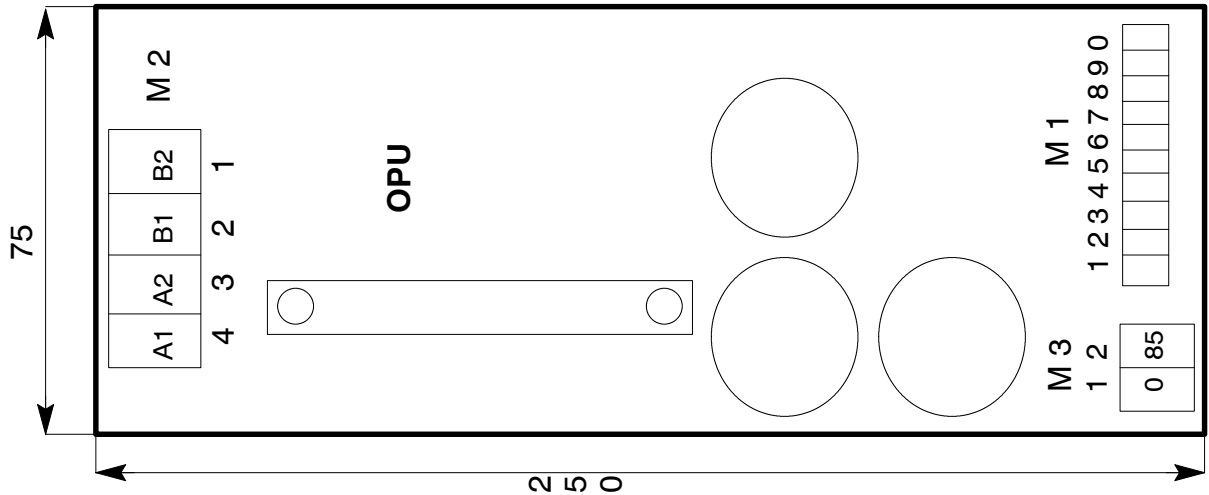




ACS 120/10 DRIVER FOR STEPPER MOTORS

<p style="text-align: center;">RAMP CARD</p>  <p style="text-align: center;">LOGIC CARD</p>  <p style="text-align: center;">POWER CARD</p>  <p style="text-align: center;">HEAT SINK</p> 	<p style="text-align: center;">PROTECTIONS</p> <p>The logic card features three LED's which indicate when a safety has been tripped:</p> <p>1) RED LED: If continuous or flashing signals a fault which has generated an overload in the driver.</p> <p>This can be caused by:</p> <ul style="list-style-type: none"> a) a short-circuit between the phases of the motor. c) a driver fault with short-circuit to earth or to the supply. d) a wrong connection made during installation of the motor's terminal wires. <p>2) GREEN LED: This signals that the voltage does not fall within the minimum or maximum limits specified in the driver specifications</p> <p>3) YELLOW LED: This signals the overload cut-out has tripped because the temperature in the heat sink has reached 80°C.</p>						
ELECTRICAL SPECIFICATIONS ACS 120/10 DRIVER							
POWER SUPPLY	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">rated Vdc</td> <td style="text-align: right;">120</td> </tr> <tr> <td>maximum Vdc</td> <td style="text-align: right;">150</td> </tr> <tr> <td>minimum Vdc</td> <td style="text-align: right;">95</td> </tr> </table>	rated Vdc	120	maximum Vdc	150	minimum Vdc	95
rated Vdc	120						
maximum Vdc	150						
minimum Vdc	95						
MIN/MAX. VOLTAGE PROTECTION THRESHOLD	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">maximum Vdc</td> <td style="text-align: right;">155</td> </tr> <tr> <td>minimum Vdc</td> <td style="text-align: right;">68</td> </tr> </table>	maximum Vdc	155	minimum Vdc	68		
maximum Vdc	155						
minimum Vdc	68						
MAX. CURRENT PER PHASE	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">maximum I (A)</td> <td style="text-align: right;">10</td> </tr> </table>	maximum I (A)	10				
maximum I (A)	10						
MIN CURRENT PER PHASE	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">minimum I (A)</td> <td style="text-align: right;">4</td> </tr> </table>	minimum I (A)	4				
minimum I (A)	4						
INDICATORS							
<p>There are FOUR GREEN LED's on the power card that indicate which sequence of phases starts up the motor and that the motor power is on.</p>							

POWER SUPPLY AND INTERFACE CARD FOR STEPPER OF MPP DRIVER: O P U



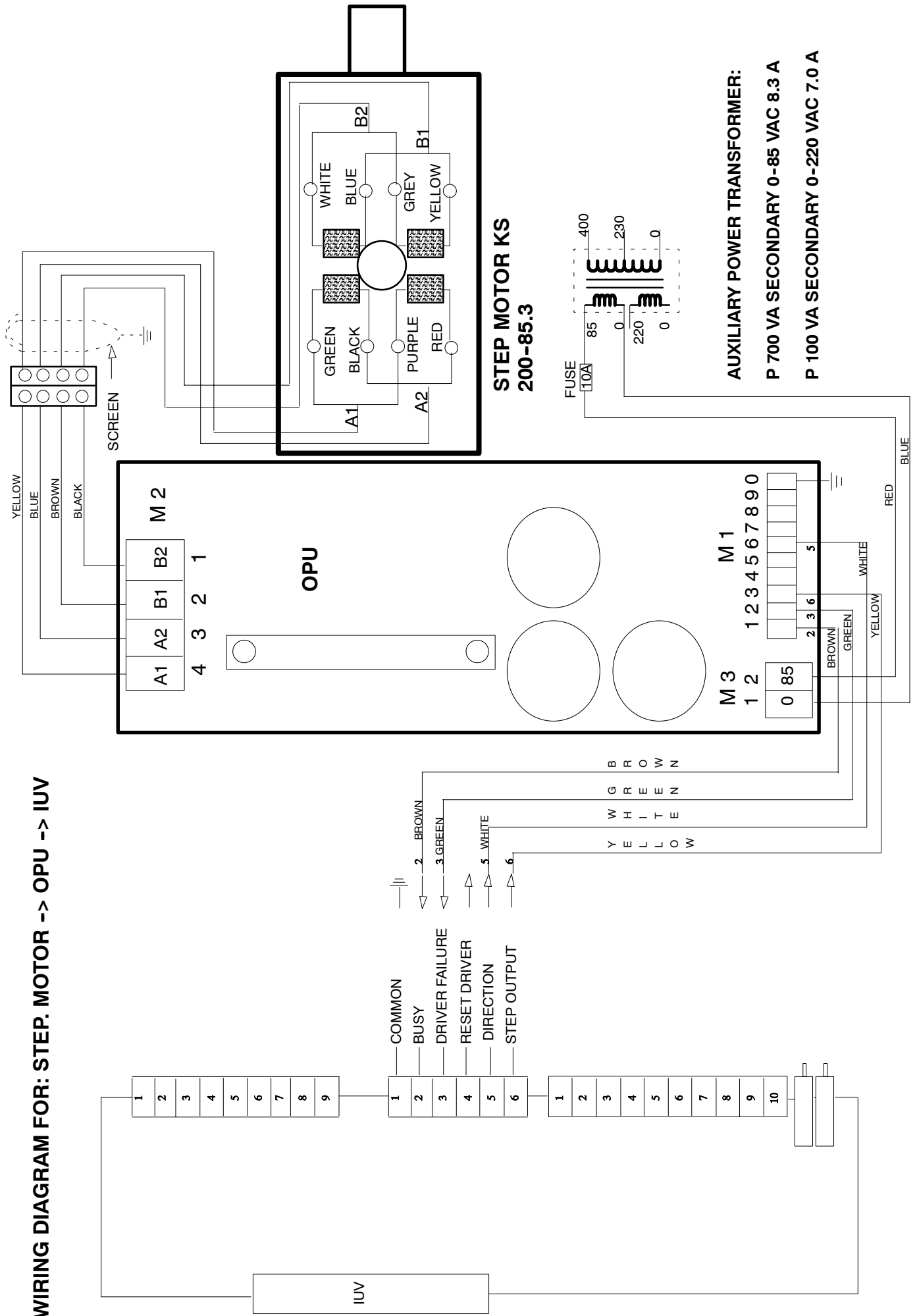
TERMINAL M1	
LOGIC SIGNAL CONNECTIONS	
PIN	NAME OF SIGNAL
1	EXTERNAL SIGNAL: BUSY
2	DRIVER FAULT: ALARM
3	STEP IN: BURST=STEPS
4	CURRENT OFF: NOP
5	SYNCHRONISATION: NOP
6	DIRECTION
7	CURRENT REDUCTION
8	N.C.: NOP
9	STEP OUT: NOP
10	EARTH=GND

TERMINAL M2	
LOGIC SIGNAL CONNECTIONS	
PIN	NAME OF SIGNAL
1	PHASE B 2
2	PHASE B 1
3	PHASE A 2
4	PHASE A 1

TERMINAL M3	
SUPPLY VOLTAGE	
PIN	OPU 120/10
1	85 VAC
2	85 VAC

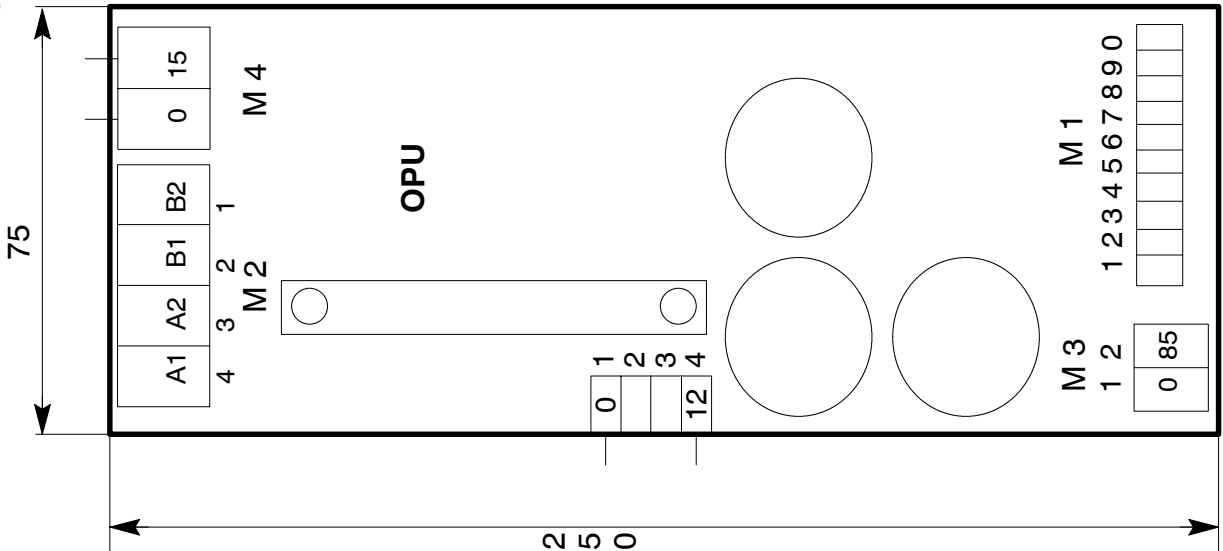
- 1) EXTERNAL SIGNAL: BUSY = "BUSY" is a signal that the motor driver card, "DRIVER", sends to the CNC, "MEP CNC", while the motor is moving.
- 2) DRIVER FAULT: ALARM = the failure signal is sent by the motor driver card, "DRIVER", to the CNC, "MEP CNC", in all cases of malfunction controlled by the system.
- 3) STEP IN: BURST = "BURST" is the signal string that the CNC, "MEP CNC" sends to the motor driver card, "DRIVER" to make it carry out the length movements.
- 4) DIRECTION = this signal is sent by the "MEP CNC" to the motor driver card "DRIVER" to determine the direction of movement.

WIRING DIAGRAM FOR: STEP. MOTOR --> OPU --> IUV



MACHINES MANUFACTURED FROM JANUARY 1995

SUPPLY AND INTERFACE CARD OF MPP DRIVER: O P U



TERMINAL M2	
LOGIC SIGNAL CONNECTIONS	
PIN	NAME OF SIGNAL
1	PHASE B 2
2	PHASE B 1
3	PHASE A 2
4	PHASE A 1

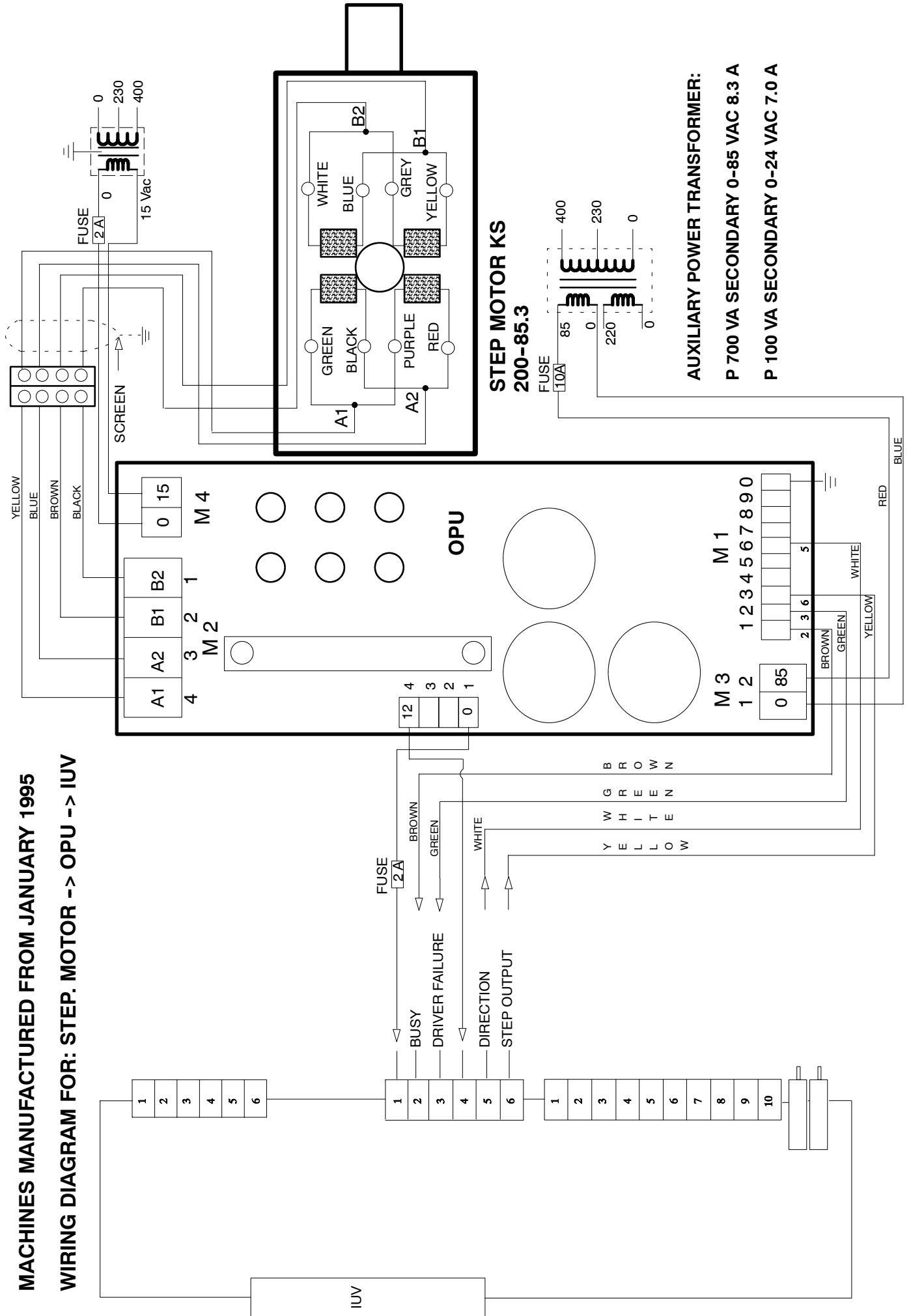
TERMINAL M1	
LOGIC SIGNAL CONNECTIONS	
PIN	NAME OF SIGNAL
1	EXTERNAL SIGNAL: BUSY
2	DRIVER FAULT: ALARM
3	STEP IN: BURST=STEPS
4	CURRENT OFF: NOP
5	SYNCHRONISATION: NOP
6	DIRECTION
7	CURRENT REDUCTION
8	N.C.: NOP
9	STEP OUT: NOP
10	EARTH=GND

TERMINAL M3	
POWER CONNECTIONS	
PIN	POWER CONNECTIONS
1	OPU 120/10
2	85 VAC
	85 VAC

- 1) EXTERNAL SIGNAL: BUSY = "BUSY" is a signal that the motor driver card, "DRIVER", sends to the CNC, "MEP CNC", while the motor is moving.
- 2) DRIVER FAULT: ALARM = the failure signal is sent by the motor driver card, "DRIVER", to the CNC, "MEP CNC", in all cases of malfunction controlled by the system.
- 3) STEP IN: BURST = "BURST" is the signal string that the CNC, "MEP CNC" sends to the motor driver card, "DRIVER" to make it carry out the length movements.
- 4) DIRECTION = this signal is sent by the "MEP CNC" to the motor driver card "DRIVER" to determine the direction of movement.

MACHINES MANUFACTURED FROM JANUARY 1995

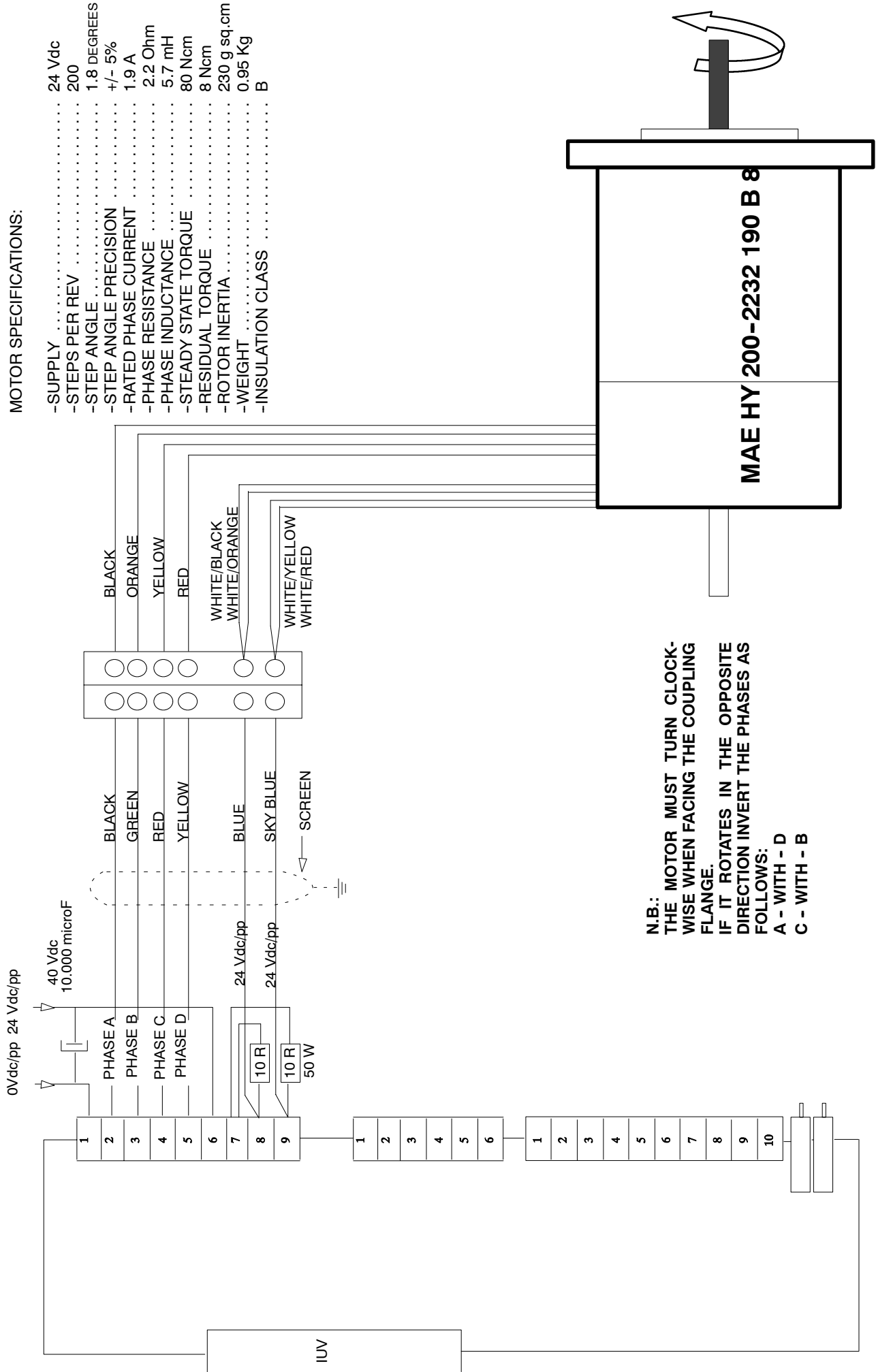
WIRING DIAGRAM FOR: STEP. MOTOR -> OPU -> IUV



STEPPER MOTOR FOR HEAD DOWNSTROKE VALVE ACTUATOR: MAE HY 200-2232 190 B 8

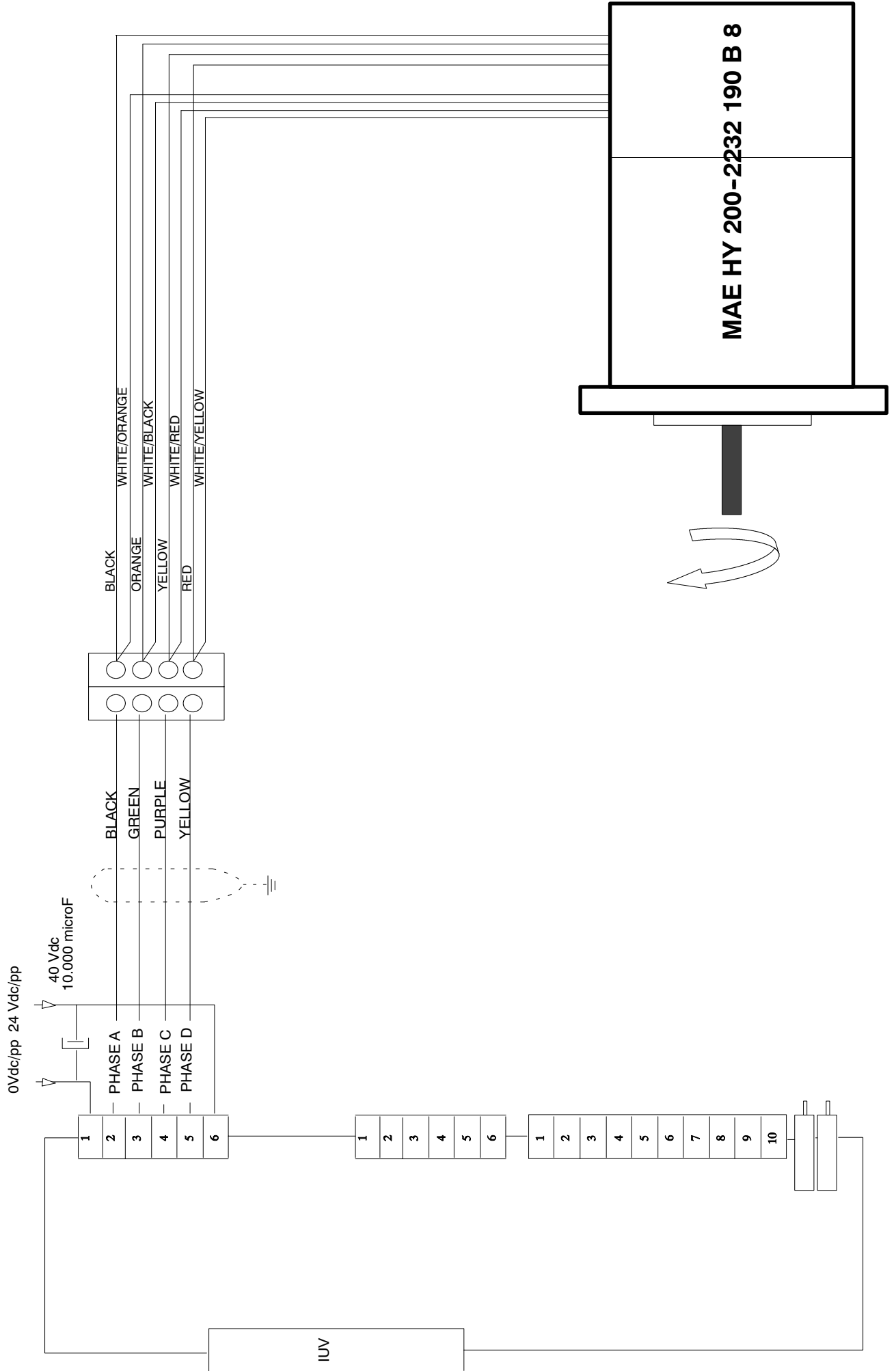
MOTOR SPECIFICATIONS:

-SUPPLY	24 Vdc
-STEPS PER REV	200
-STEP ANGLE	1.8 DEGREES
-STEP ANGLE PRECISION	+/- 5%
-RATED PHASE CURRENT	1.9 A
-PHASE RESISTANCE	2.2 Ohm
-PHASE INDUCTANCE	5.7 mH
-STEADY STATE TORQUE	80 Ncm
-RESIDUAL TORQUE	8 Ncm
-ROTOR INERTIA	230 g sq.cm
-WEIGHT	0.95 Kg
-INSULATION CLASS	B

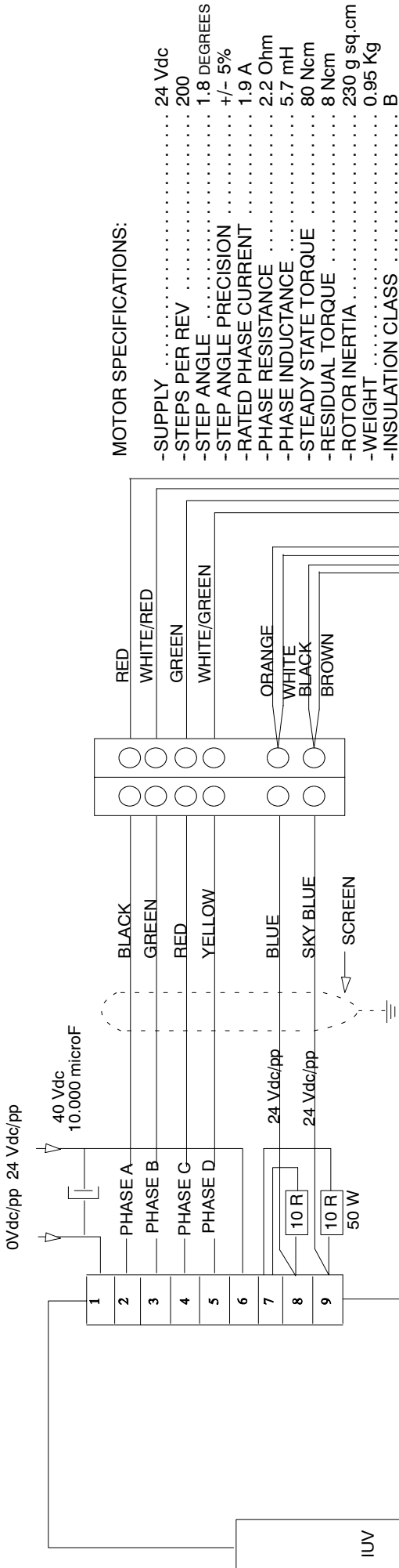


N.B.:
 THE MOTOR MUST TURN CLOCK-
 WISE WHEN FACING THE COUPLING
 FLANGE.
 IF IT ROTATES IN THE OPPOSITE
 DIRECTION INVERT THE PHASES AS
 FOLLOWS:
 A - WITH - D
 C - WITH - B

Wiring for MAE HY 200-2232 190 B 8 for machines manufactured from January 1995

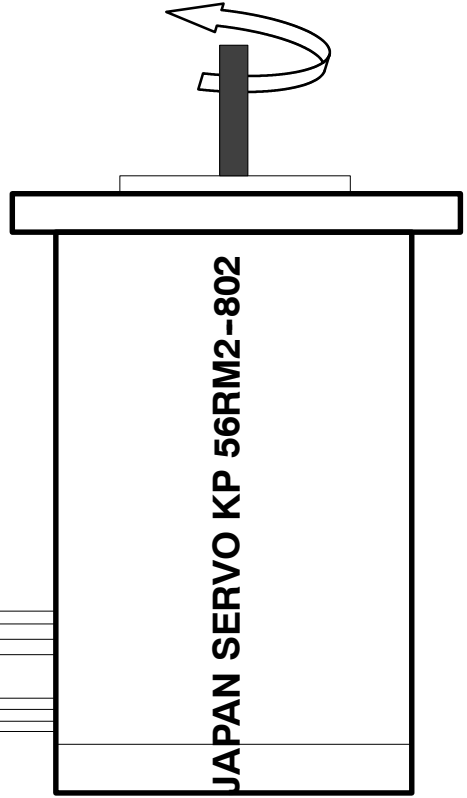


STEPPER MOTOR FOR HEAD DOWNSTROKE VALVE ACTUATOR MODEL: JAPAN SERVO KP 56RM2-802



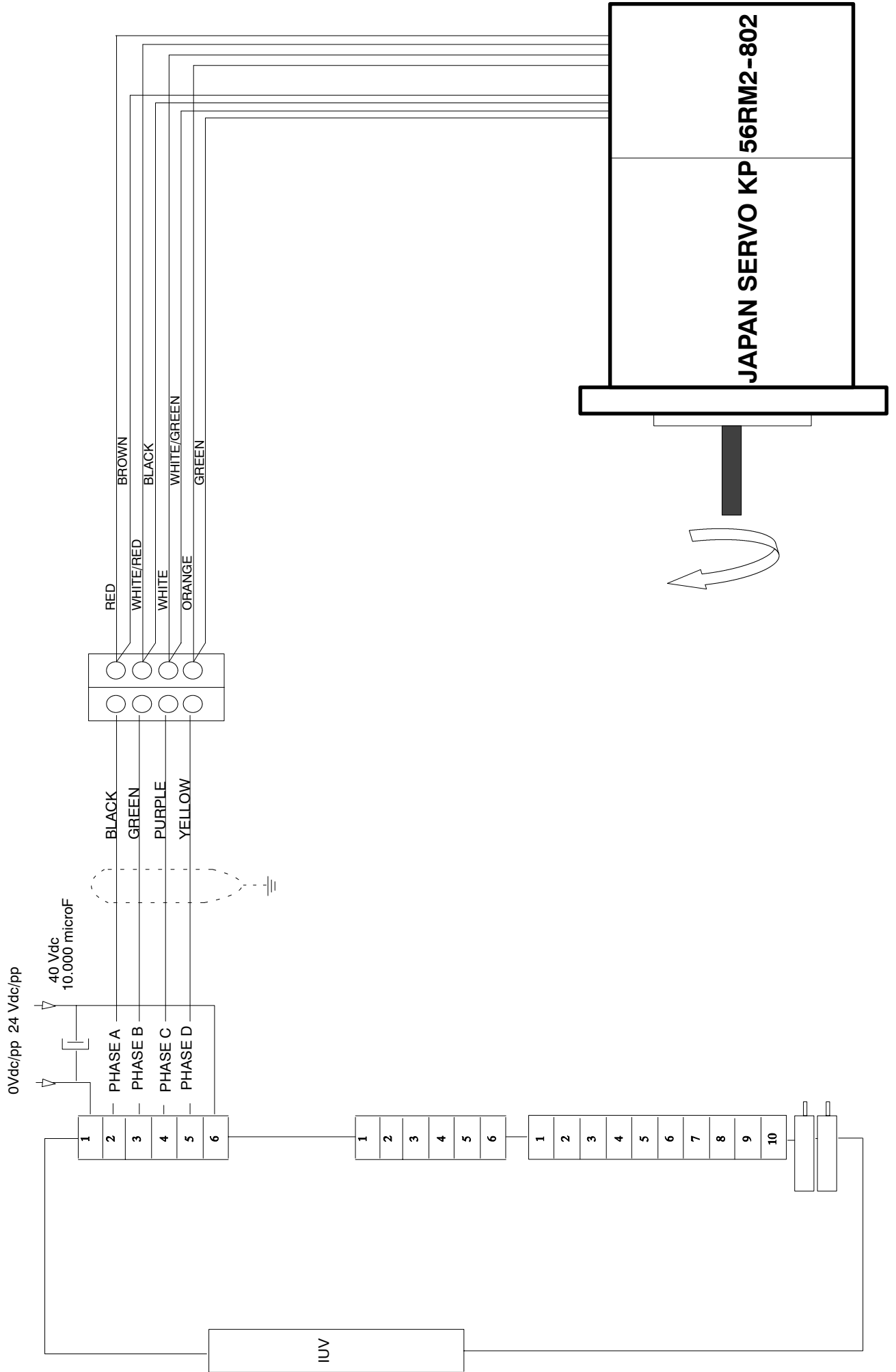
MOTOR SPECIFICATIONS:

-SUPPLY	24 Vdc
-STEPS PER REV	200
-STEP ANGLE	1.8 DEGREES
-STEP ANGLE PRECISION	+/- 5%
-RATED PHASE CURRENT	1.9 A
-PHASE RESISTANCE	2.2 Ohm
-PHASE INDUCTANCE	5.7 mH
-STEADY STATE TORQUE	80 Ncm
-RESIDUAL TORQUE	8 Ncm
-ROTOR INERTIA	230 g sq.cm
-WEIGHT	0.95 Kg
-INSULATION CLASS	B

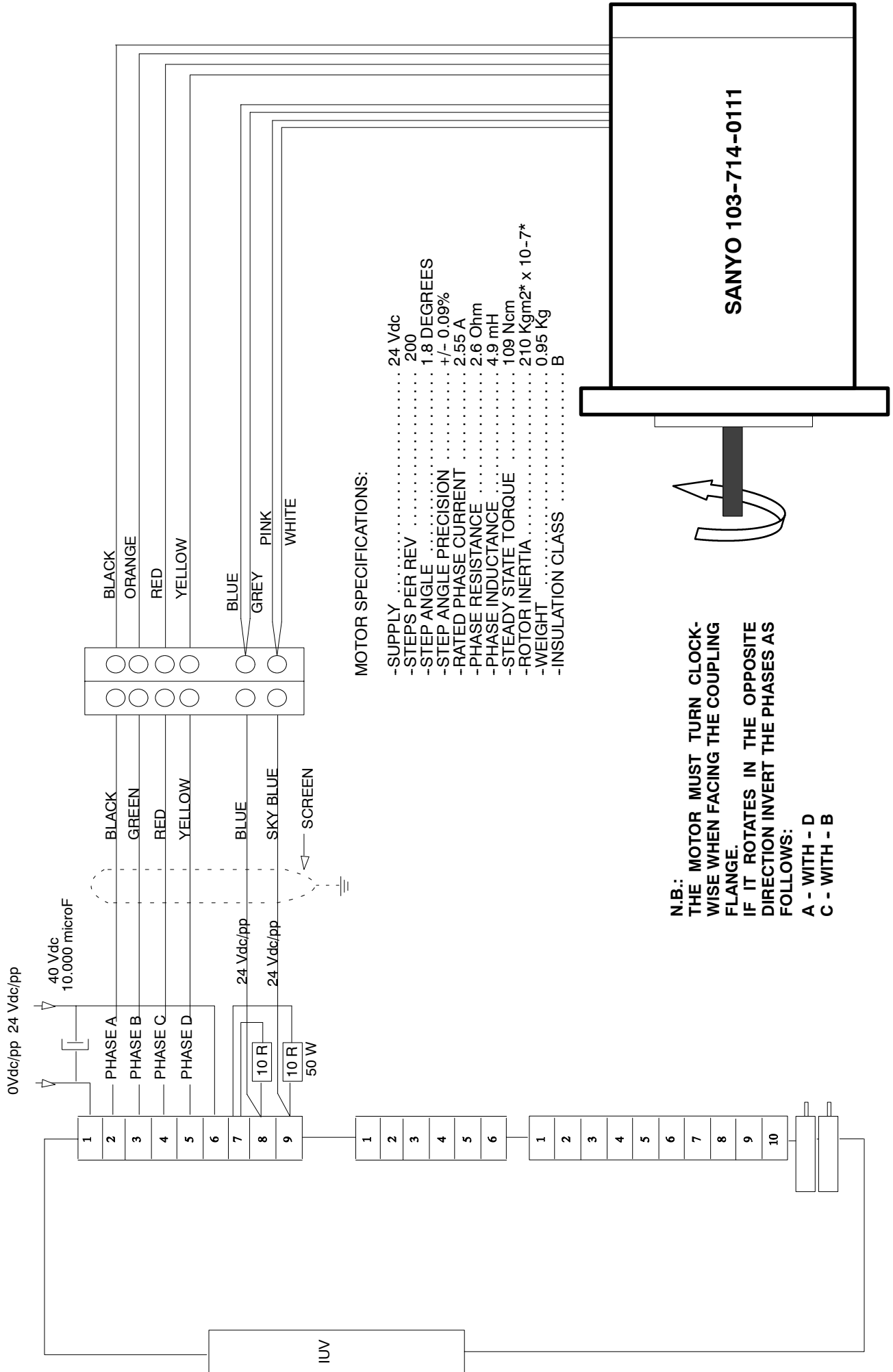


N.B.:
 THE MOTOR MUST TURN CLOCK-
 WISE WHEN FACING THE COUPLING
 FLANGE.
 IF IT ROTATES IN THE OPPOSITE
 DIRECTION INVERT THE PHASES AS
 FOLLOWS:
 A - WITH - D
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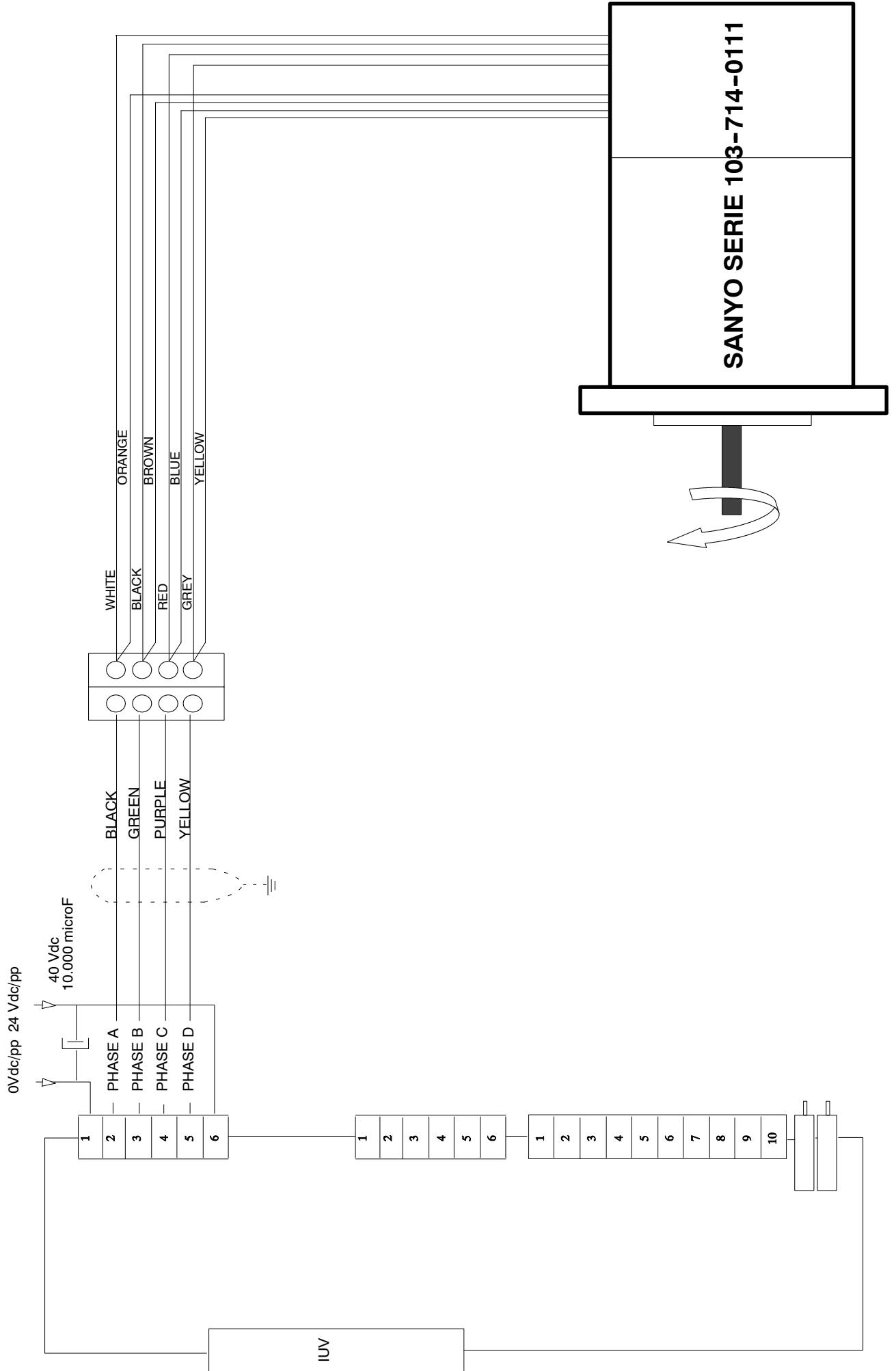
Wiring for JAPAN SERVO KP 56RM2-802 for machines manufactured from January 1995



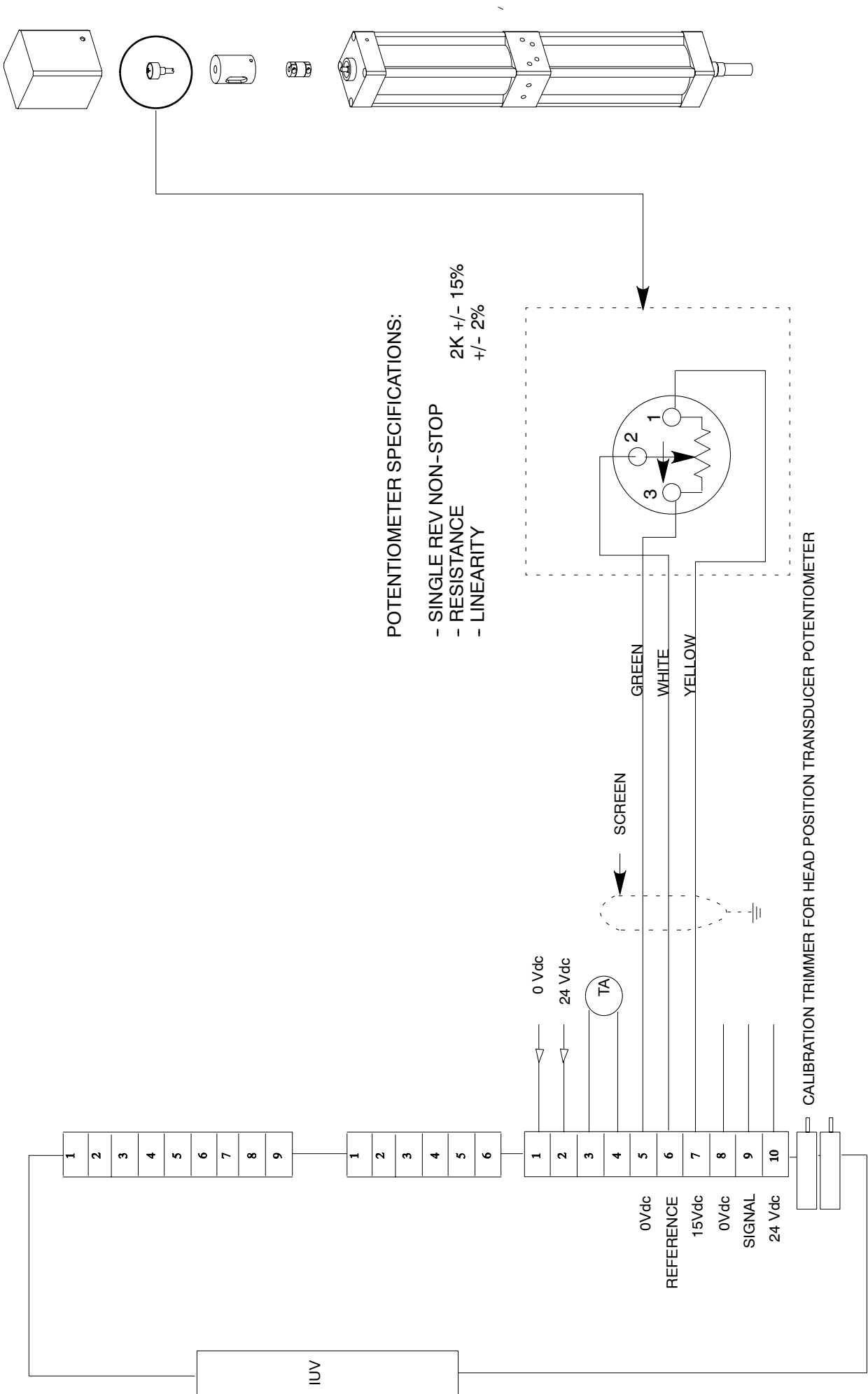
STEPPER MOTOR FOR HEAD DOWNSTROKE VALVE ACTUATOR MODEL: SANYO 103-714-0111

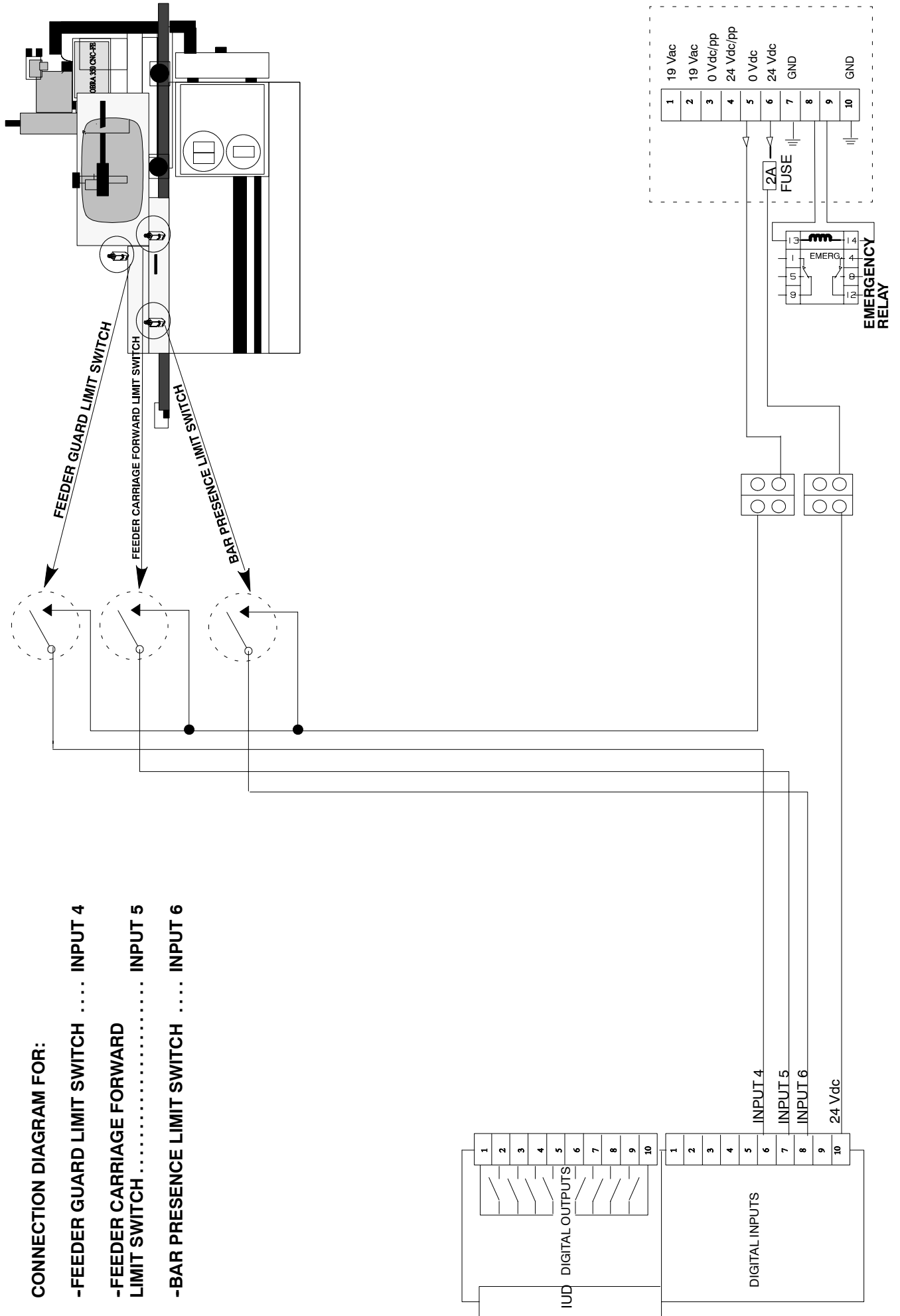


Wiring for JAPAN SERVO KP 56RM2-802 for machines manufactured from January 1995



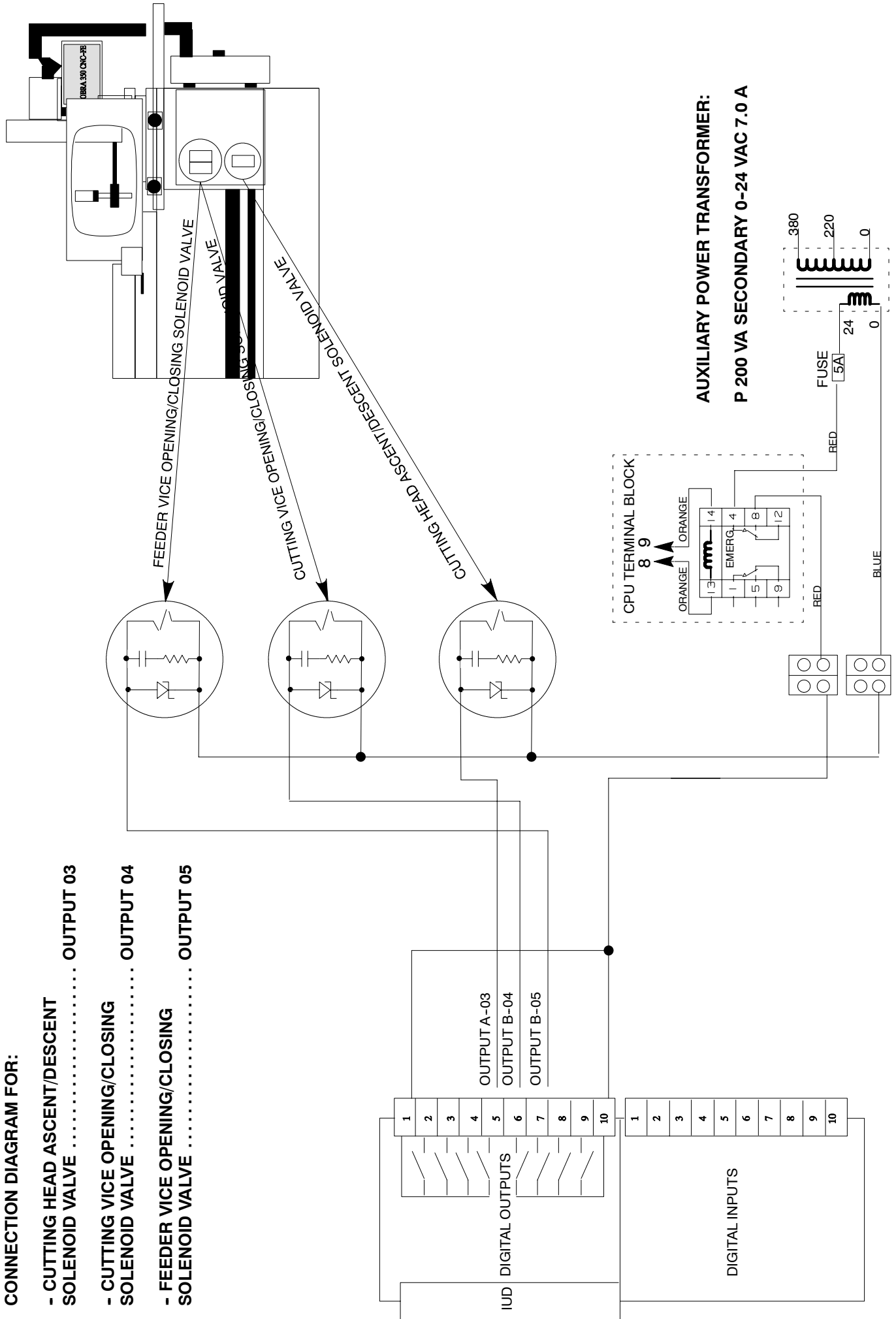
HEAD POSITION TRANSDUCER POTENTIOMETER




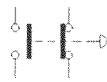
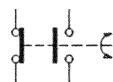
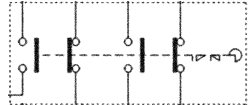
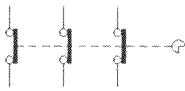
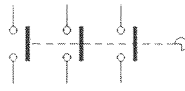



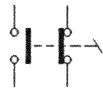



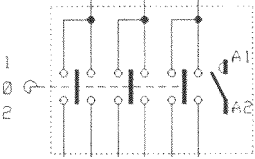
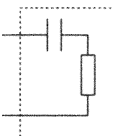
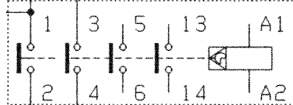



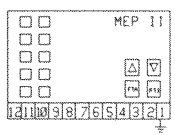
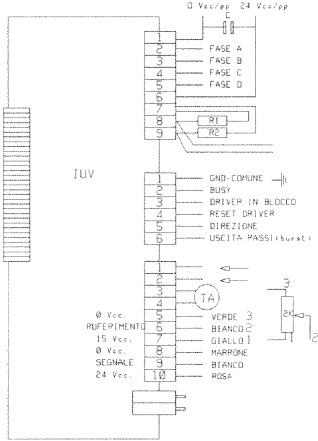
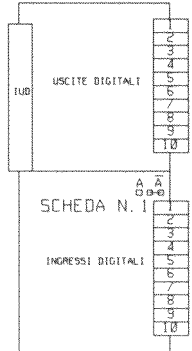
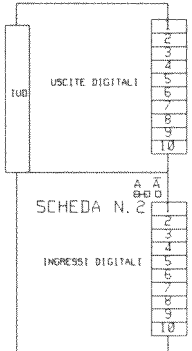
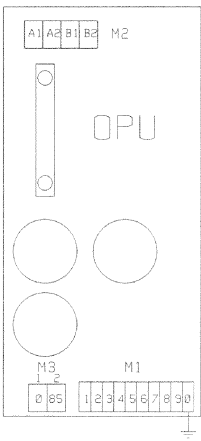


CONNECTION DIAGRAM FOR:

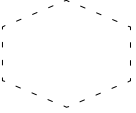
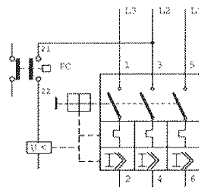
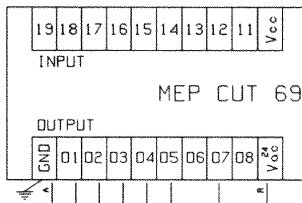

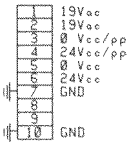
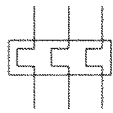
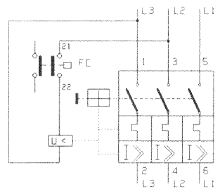
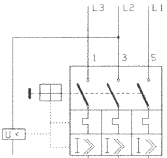
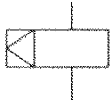
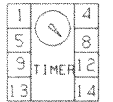


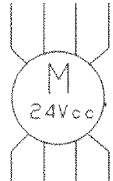
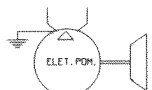
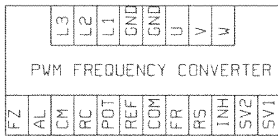

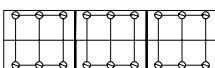
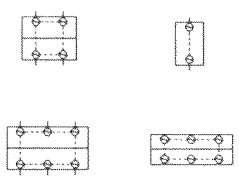
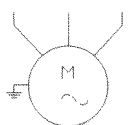
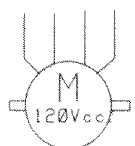
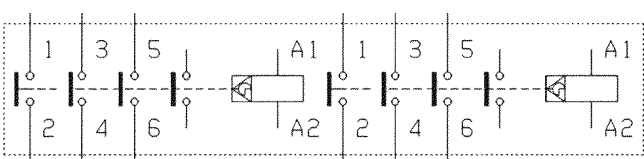


- CUTTING HEAD ASCENT/DESCENT SOLENOID VALVE OUTPUT 03
- CUTTING VICE OPENING/CLOSING SOLENOID VALVE OUTPUT 04
- FEEDER VICE OPENING/CLOSING SOLENOID VALVE OUTPUT 05



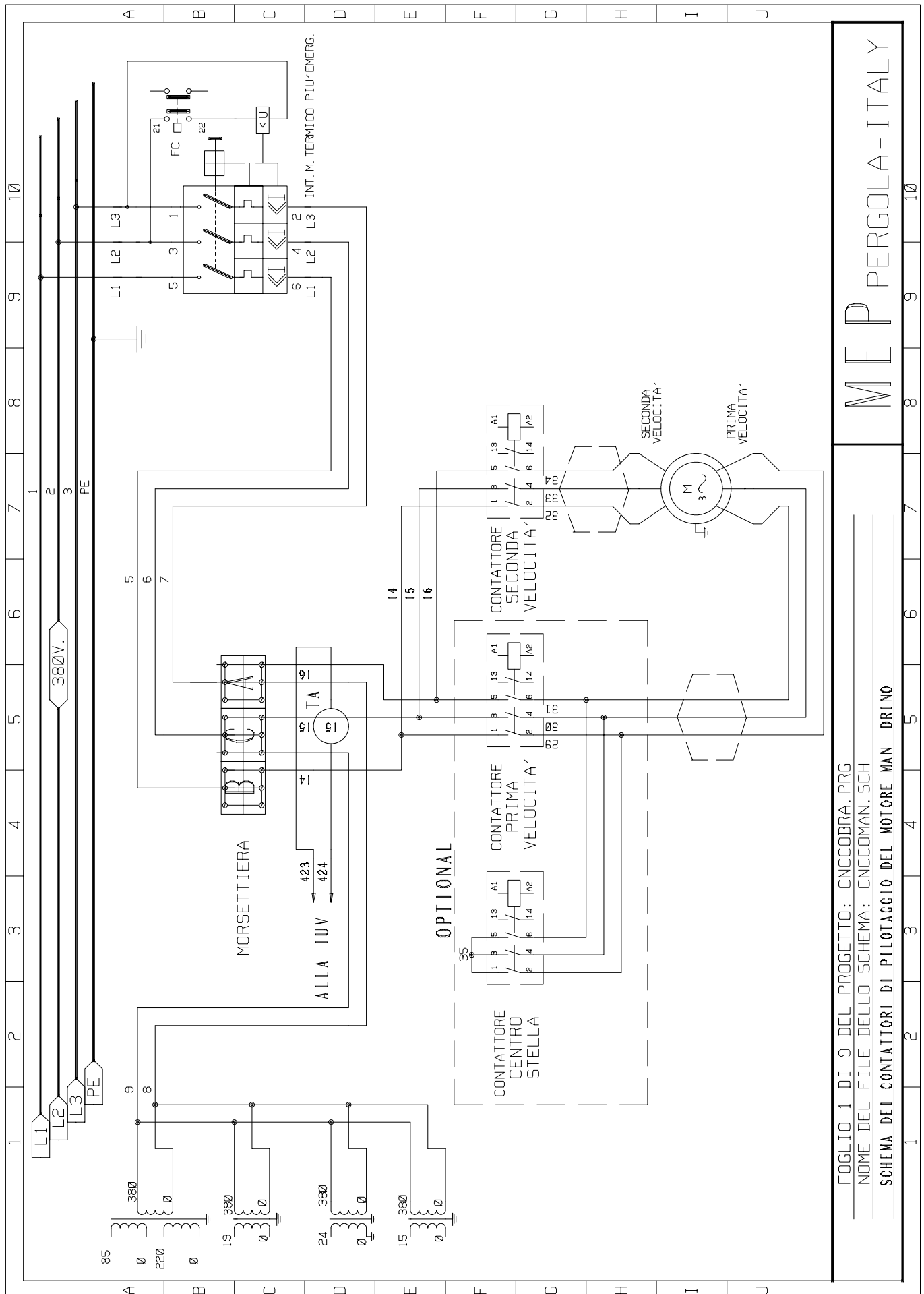
GENERAL KEY TO STANDARDISED ELECTRIC COMPONENTS (CEI STANDARDS)

<p>PULSANTE APERTURA/CHIUSURA MORSA (Cod. 022.0948) (Cod. 022.0949)</p> 	<p>EMERGENZA (Cod. 022.0946) (Cod. 022.0947)</p> 	<p>SELETTORE (A 2 Pos. Cod. 022.0962) (A 3 Pos. Cod. 022.0961)</p> 	<p>SELETTORE FLUIDO REFRIGERANTE</p> 
<p>PULSANTE MULTIPLO A CAMME NORMALMENTE APERTO</p> 	<p>PULSANTE MULTIPLO A CAMME NORMALMENTE CHIUSO</p> 	<p>MICROINTERRUTTORE (Cod. 022.0515)</p> 	<p>FINECORSA (Cod. 022.0501)</p> 
<p>PRESSOSTATO (Cod. 043.0142)</p> 	<p>PEDALIERA (Cod. 043.0502)</p> 	<p>FINECORSA DI SICUREZZA (Cod. 022.0037)</p> 	<p>ELETTROVALVOLA (A 3 vie Cod. 043.0024) (A 5 vie Cod. 043.0023)</p> 
<p>DIODO LED (Volt. 24 Cod. 022.0862) (Volt. 110 Cod. 022.0863)</p> 	<p>COMMUTATORE DI POLARITÀ (Cod. 022.0023)</p> 	<p>FILTRO ANTIDISTURBO ELETTROPOMPA (Cod. 022.0650)</p> 	<p>CONTATTORE MOTORE (Cod. 022.0087)</p> 
<p>BOBINA DI COMANDO (Cod. 022.0612)</p> 	<p>POTENZIOMETRO (Cod. 022.0046)</p> 	<p>TRASFORMATORE (Cod. 022.0070)</p> 	<p>CONTROLLORE MEP 11 (Cod. 022.0806)</p> 
<p>SCHEDA IUUV (Cod. 022.0831)</p> 	<p>SCHEDA 1 IN/OUT DIGITALI IUUV</p> 	<p>SCHEDA 2 IN/OUT DIGITALI IUUV</p> 	<p>SCHEDA OPU (Cod. 022.0891)</p> 

GENERAL KEY TO STANDARDISED ELECTRIC COMPONENTS (CEI STANDARDS)

<p>SCHERMO</p> 	<p>INTERRUTTORE MAGNETO-TERMICO (D)</p> 	<p>CONTROLLORE MEP 69 (Cod. 022.0805)</p> 	<p>STRAIN GAUGE (Cod. 022.2151)</p> 
<p>MORSETTIERA SCHEDA CPU</p> 	<p>DISGIUNTORE TERMICO</p> 	<p>INTERRUTTORE MAGNETO-TERMICO + EMERGENZA + FC (D)</p> 	<p>INTERRUTTORE MAGNETO - TERMICO + EMERGENZA</p> 
<p>BOBINA A CHIUSURA MECCANICA</p> 	<p>TIMER (Cod. 022.0091)</p> 	<p>MORSETTO + FUSIBILE</p> 	<p>PROTEZIONE DA CORTO-CIRCUITI</p> 
<p>MOTORE MAE HY (Cod. 019.3551)</p> 	<p>ELETTROPOMPA (Cod. 028.0251)</p> 	<p>CONVERTITORE DI FREQUENZA (Cod. 022.0793)</p> 	<p>AMPEROMETRO DIGITALE (Cod. 022.0989)</p> 
<p>MORSETTIERA A GRUPPI DA TRE</p> 	<p>MORSETTI</p> 	<p>MOTORE PRINCIPALE (Cod. 019.1706)</p> 	<p>MOTORE JAPAN SERVO KP (Cod. 019.3401)</p> 
<p>TELEINVERTITORE</p> 		<p>MORSETTI AUSILIARI</p> 	<p>MORSETTIERA</p> 

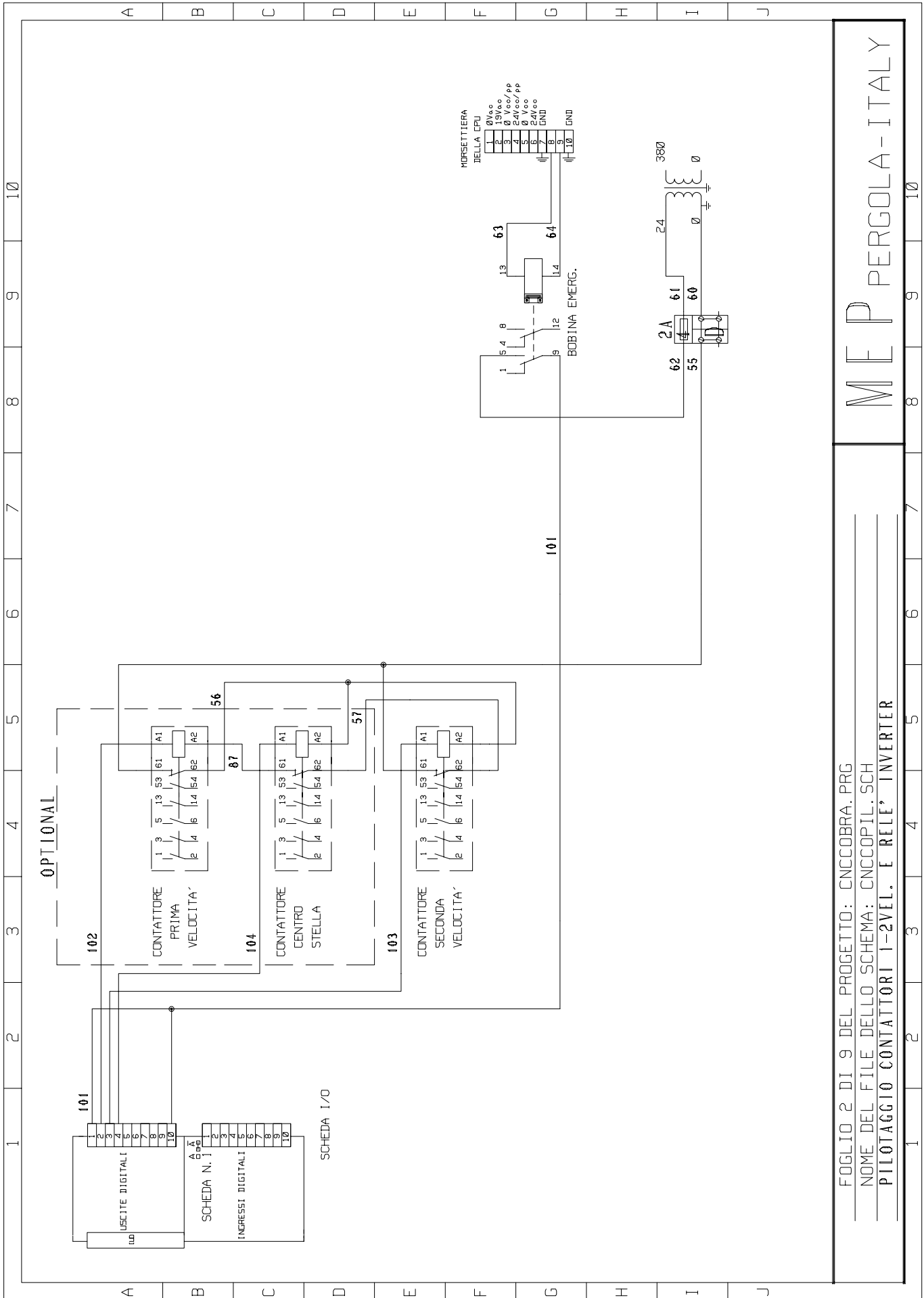
5.1.3 - Standardised wiring diagrams (CEI standards)



MEP PERGOLA-ITALY

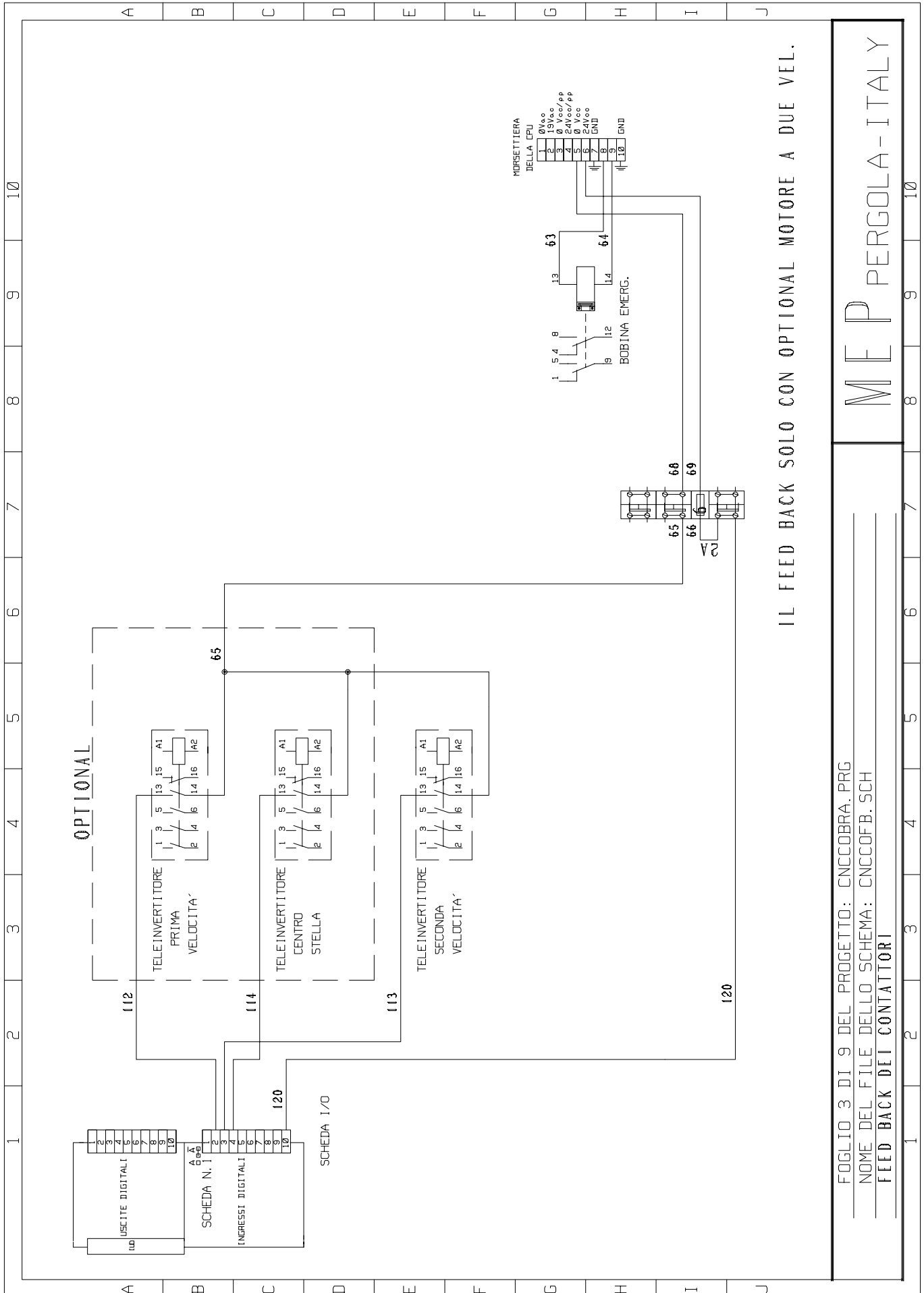
FOGLIO 1 DI 9 DEL PROGETTO: CNCOBRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNCOMAN.SCH
 SCHEMA DEI CONTATTORI DI PILOTAGGIO DEL MOTORE MAN DRINO

(continued) Standardised wiring diagrams



FOGLIO 2 DI 9 DEL PROGETTO: CNC00BRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNC00PIL.SCH
 PILOTAGGIO CONTATTORI 1-2VEL. E RELE' INVERTER

(continued) Standardised wiring diagrams

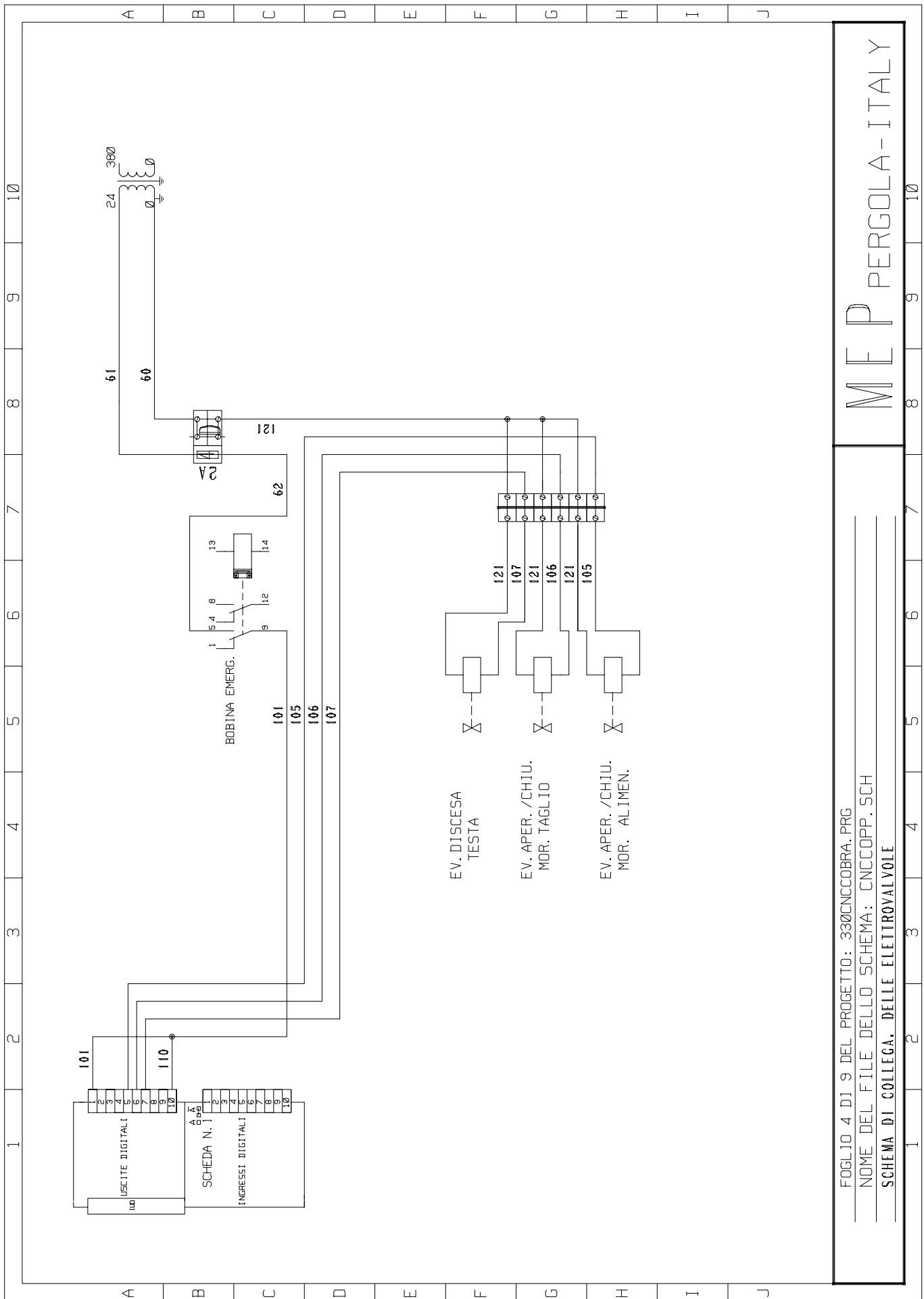


IL FEED BACK SOLO CON OPTIONAL MOTORE A DUE VEL.

FOGLIO 3 DI 9 DEL PROGETTO: CNC00BRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNC00FB.SCH
 FEED BACK DEI CONTATTORI

MEP PERGOLA-ITALY

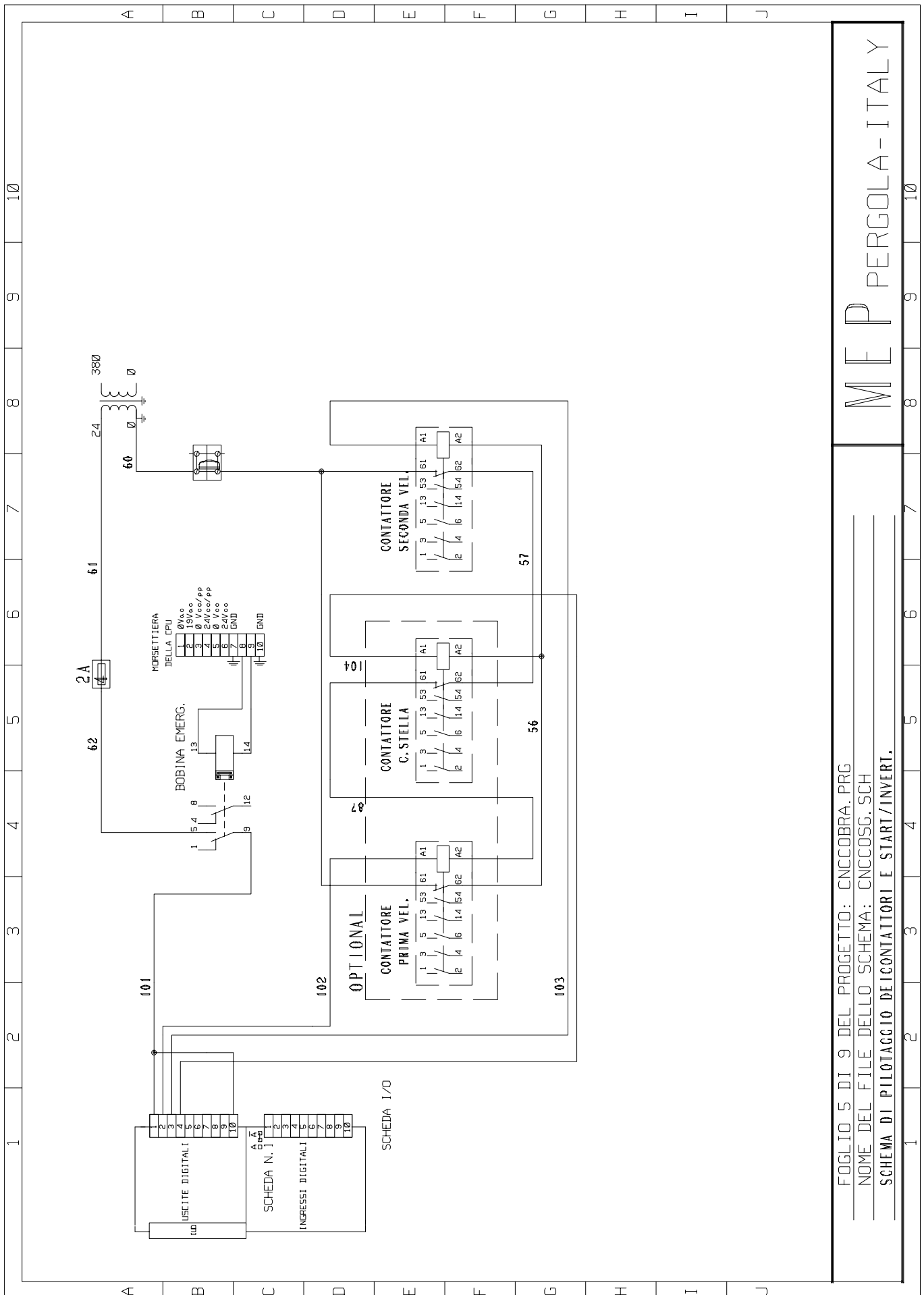
(continued) Standardised wiring diagrams



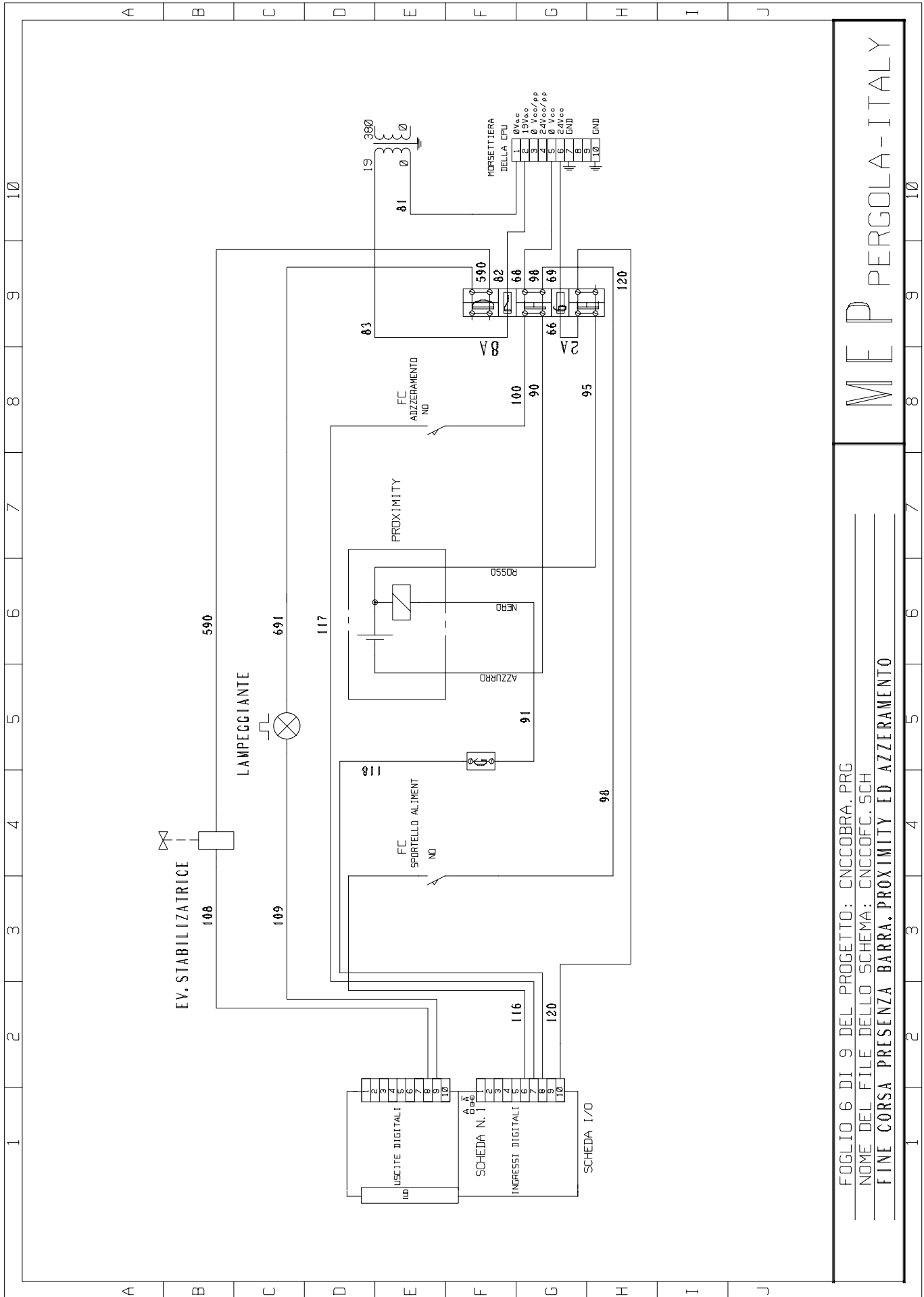
MEP PERGOLA-ITALY

FOGLIO 4 DI 9 DEL PROGETTO: 330CNCBOBRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNCOPP.SCH
 SCHEMA DI COLLEGA. DELLE ELETTROVALVOLE

(continued) Standardised wiring diagrams



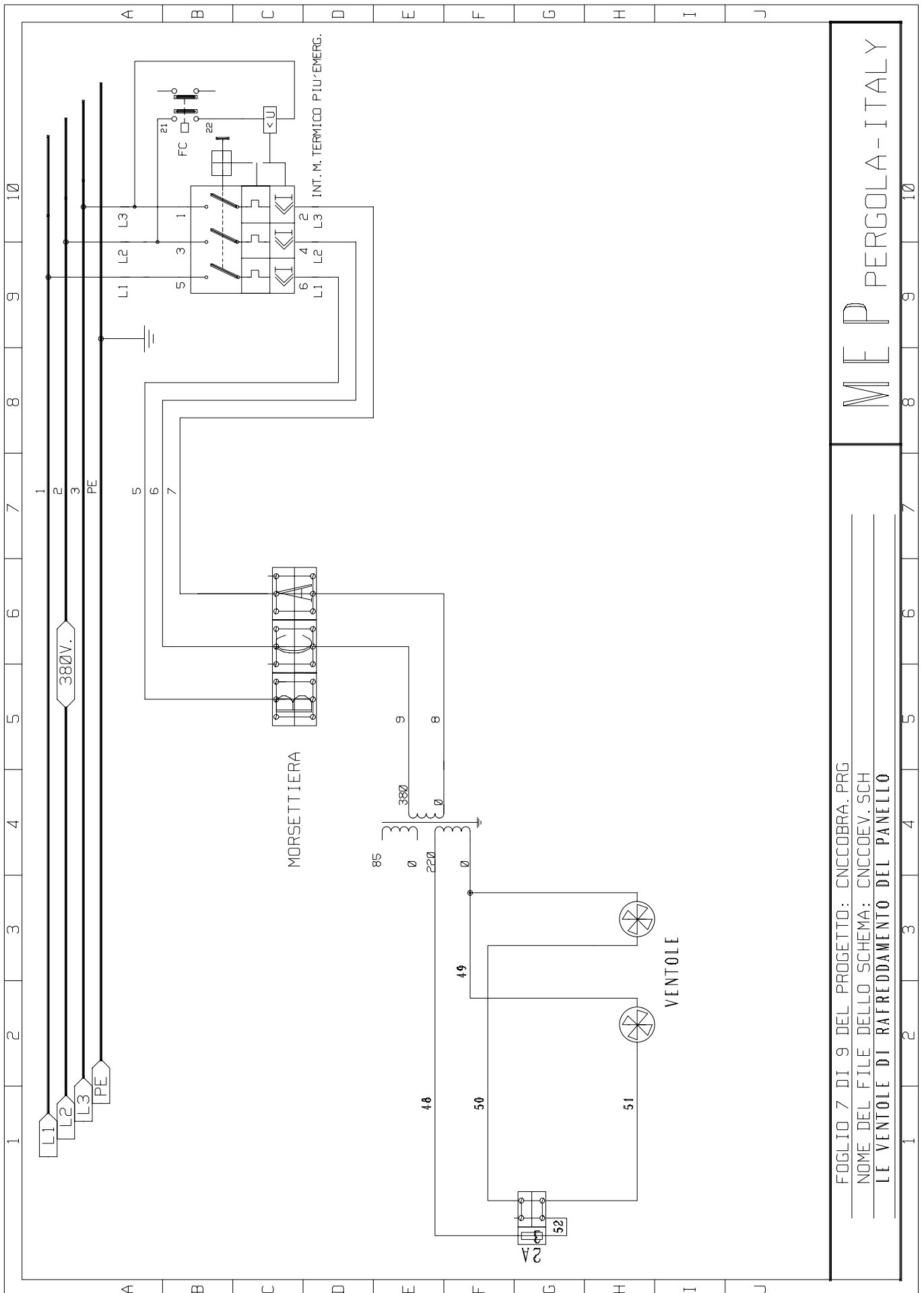
(continued) Standardised wiring diagrams



MEP PERGOLA-ITALY

FOGLIO 6 DI 9 DEL PROGETTO: CNC00BRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNC00FC.SCH
 FINE CORSA PRESENZA BARRA, PROXIMITY ED AZZERAMENTO

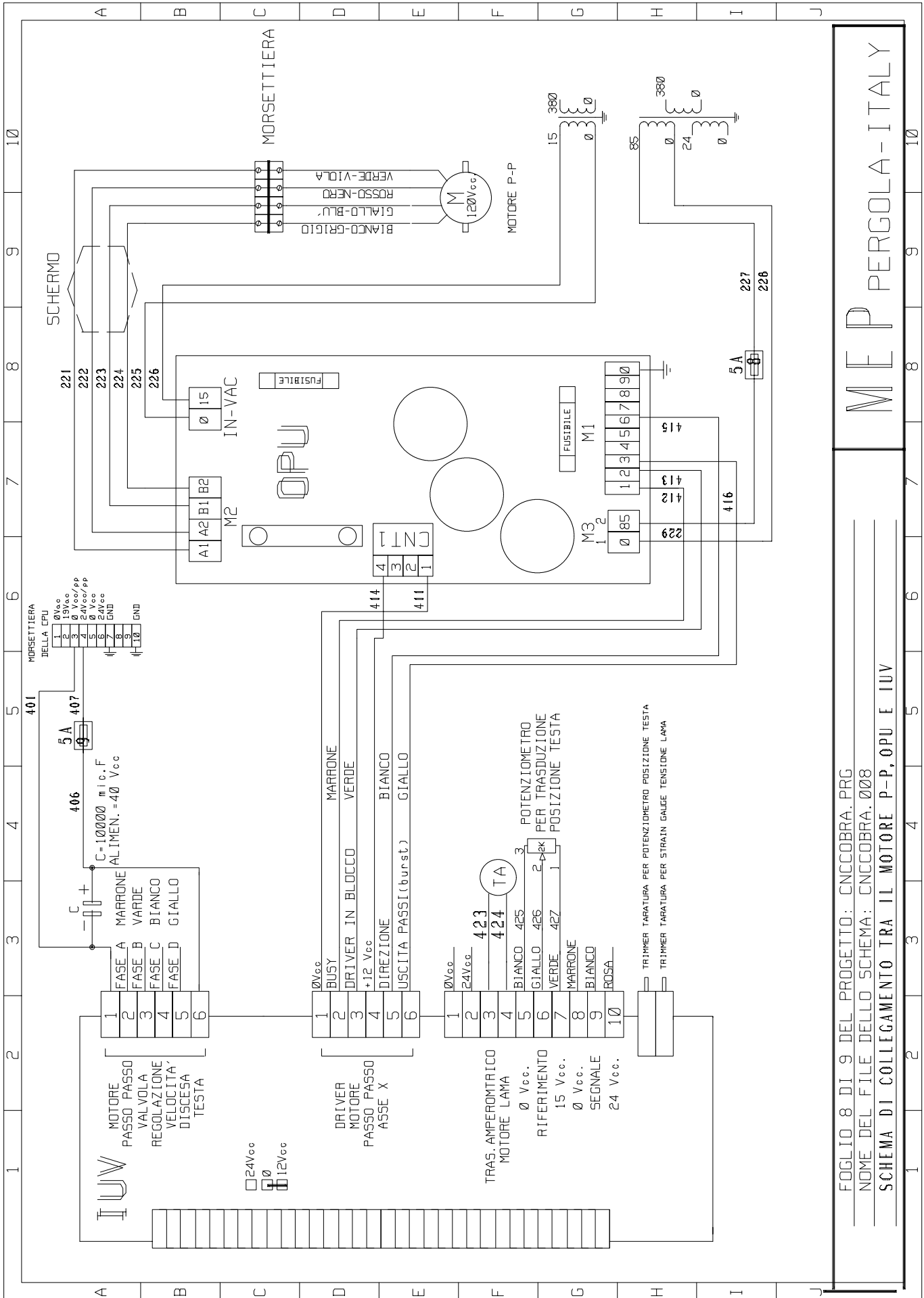
(continued) Standardised wiring diagrams



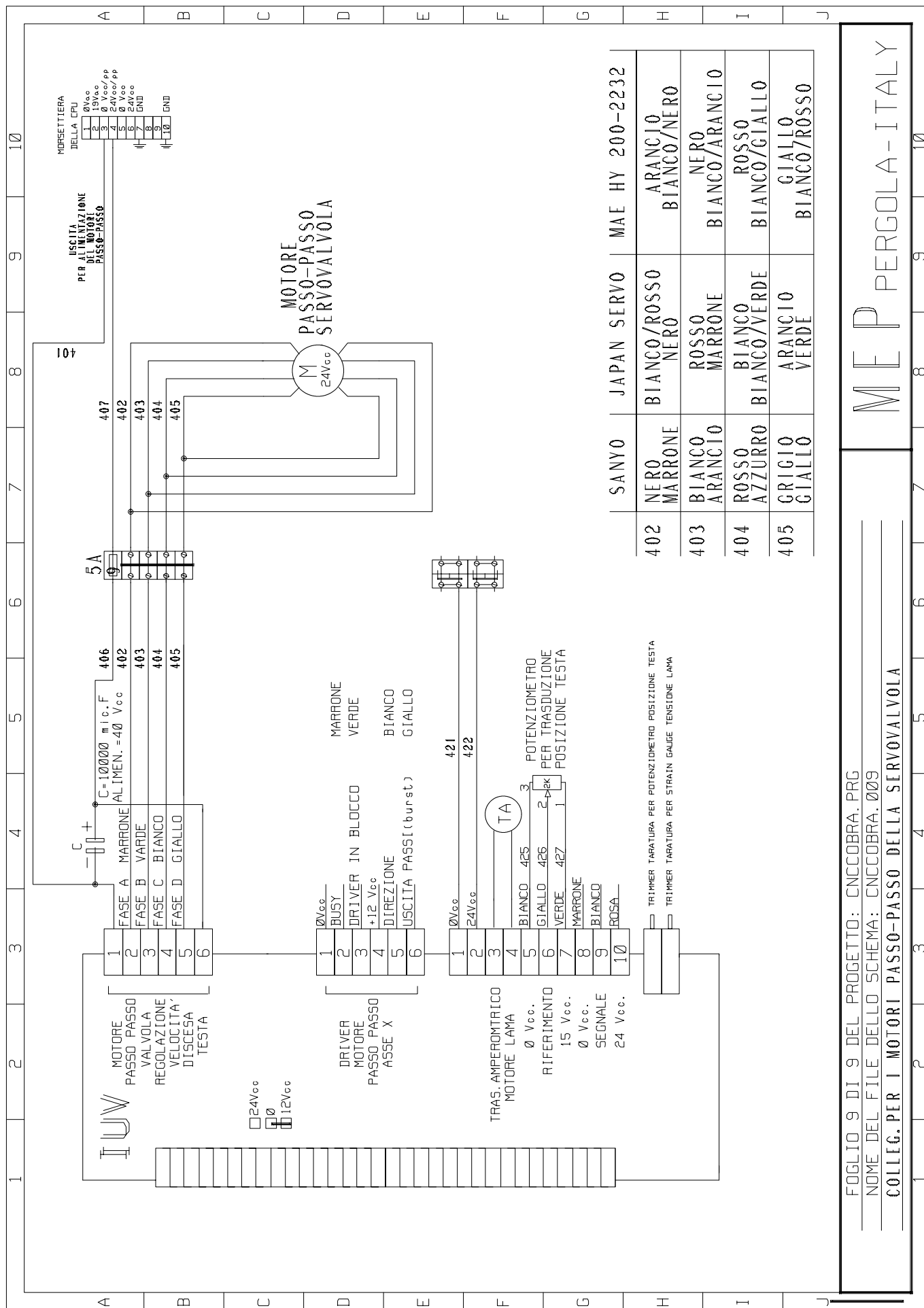
FOGLIO 7 DI 9 DEL PROGETTO: CNCOBRA.PRG
 NOME DEL FILE DELLO SCHEMA: CNC0EV.SCH
 LE VENTOLE DI RAFFREDDAMENTO DEL PANNELLO

MEP PERGOLA-ITALY

(continued) Standardised wiring diagrams



(continued) Standardised wiring diagrams



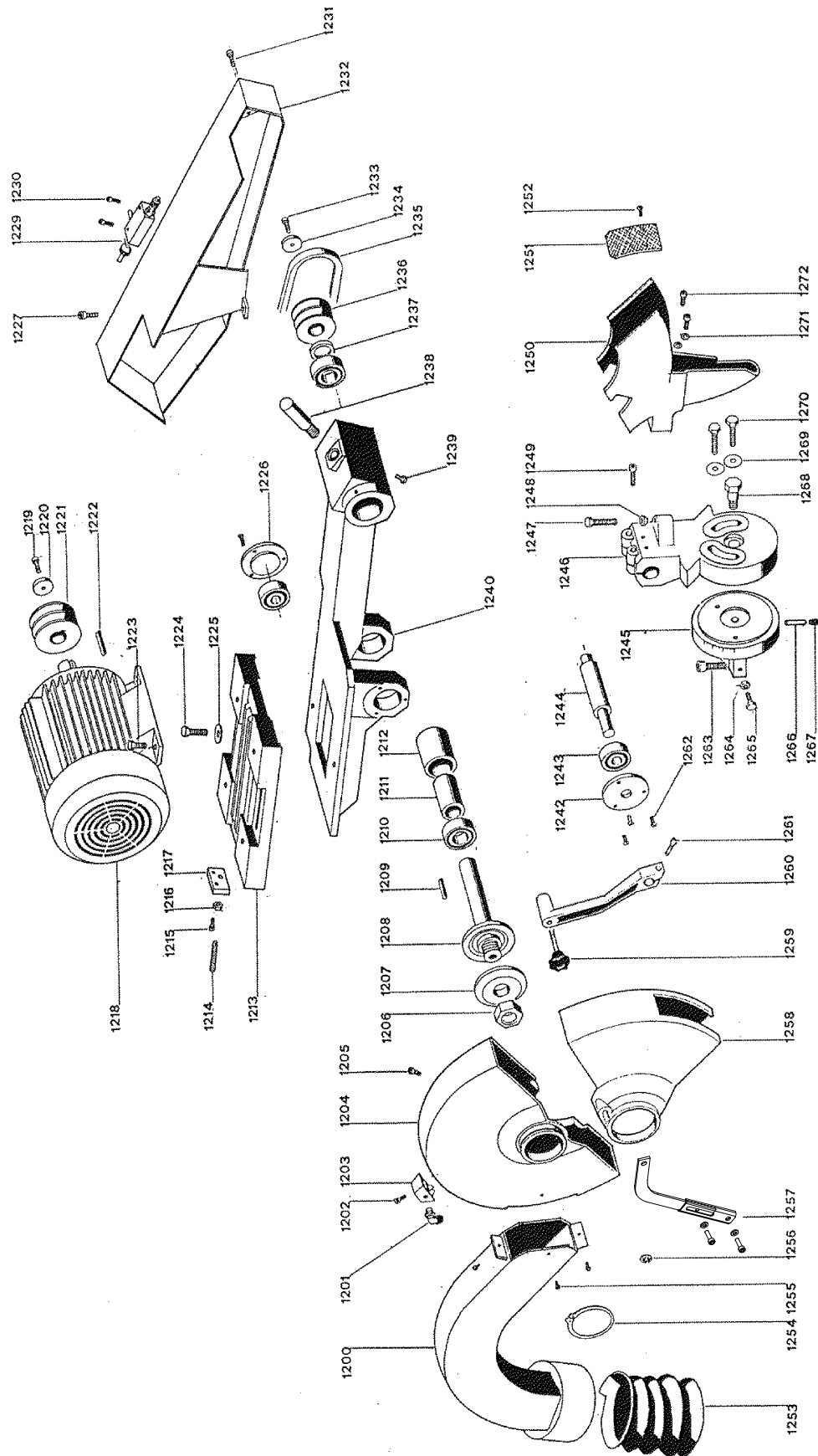
MEP PERGOLA-ITALY

FOGLIO 9 DI 9 DEL PROGETTO: CNC00BRA.PRG
NOME DEL FILE DELLO SCHEMA: CNC00BRA.009
COLLEG. PER I MOTORI PASSO-PASSO DELLA SERVOVALVOLA

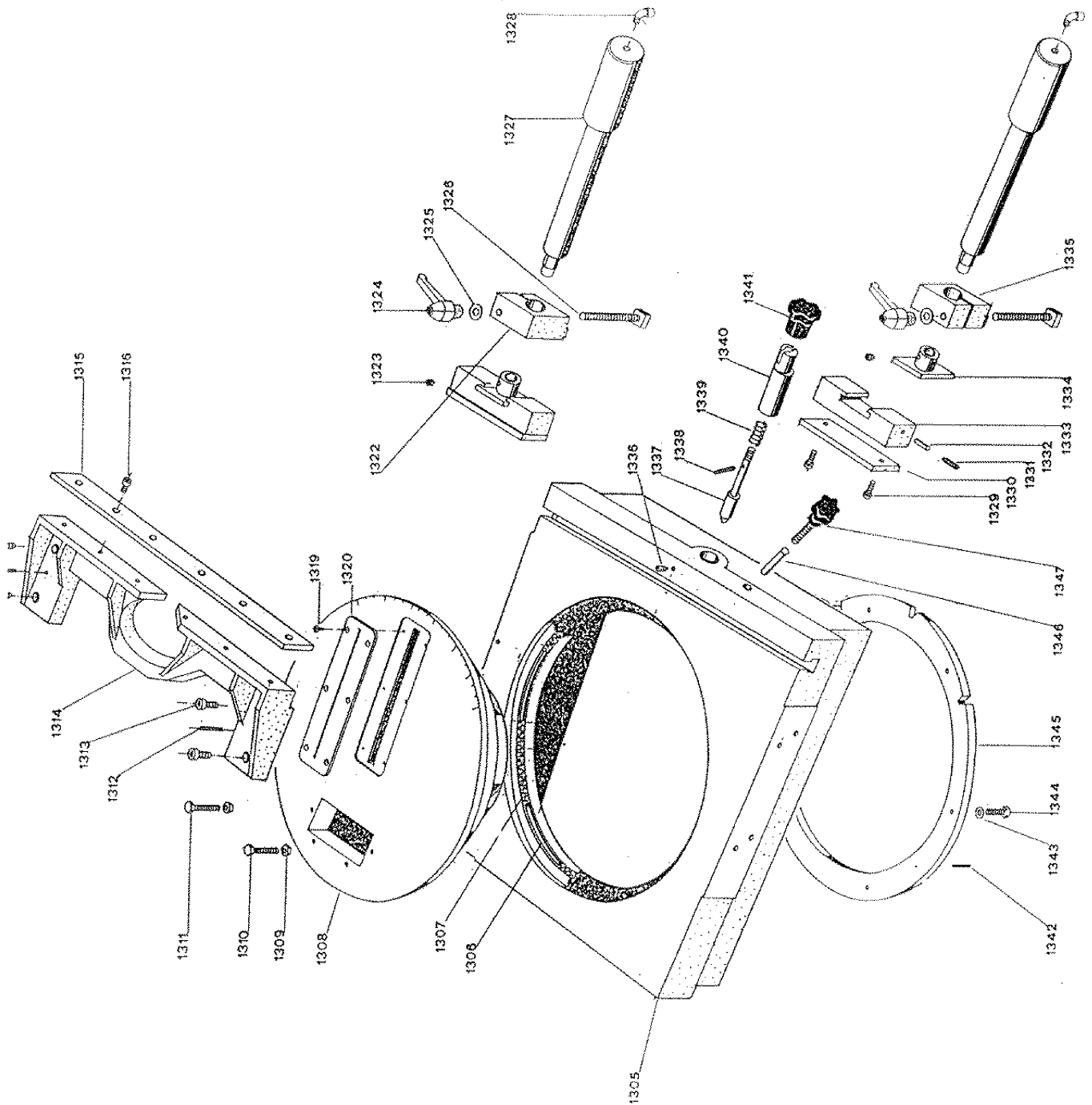
5.2 - Exploded views

This part of the manual contains a selection of exploded views, which will assist in gaining a thorough knowledge of the machine.

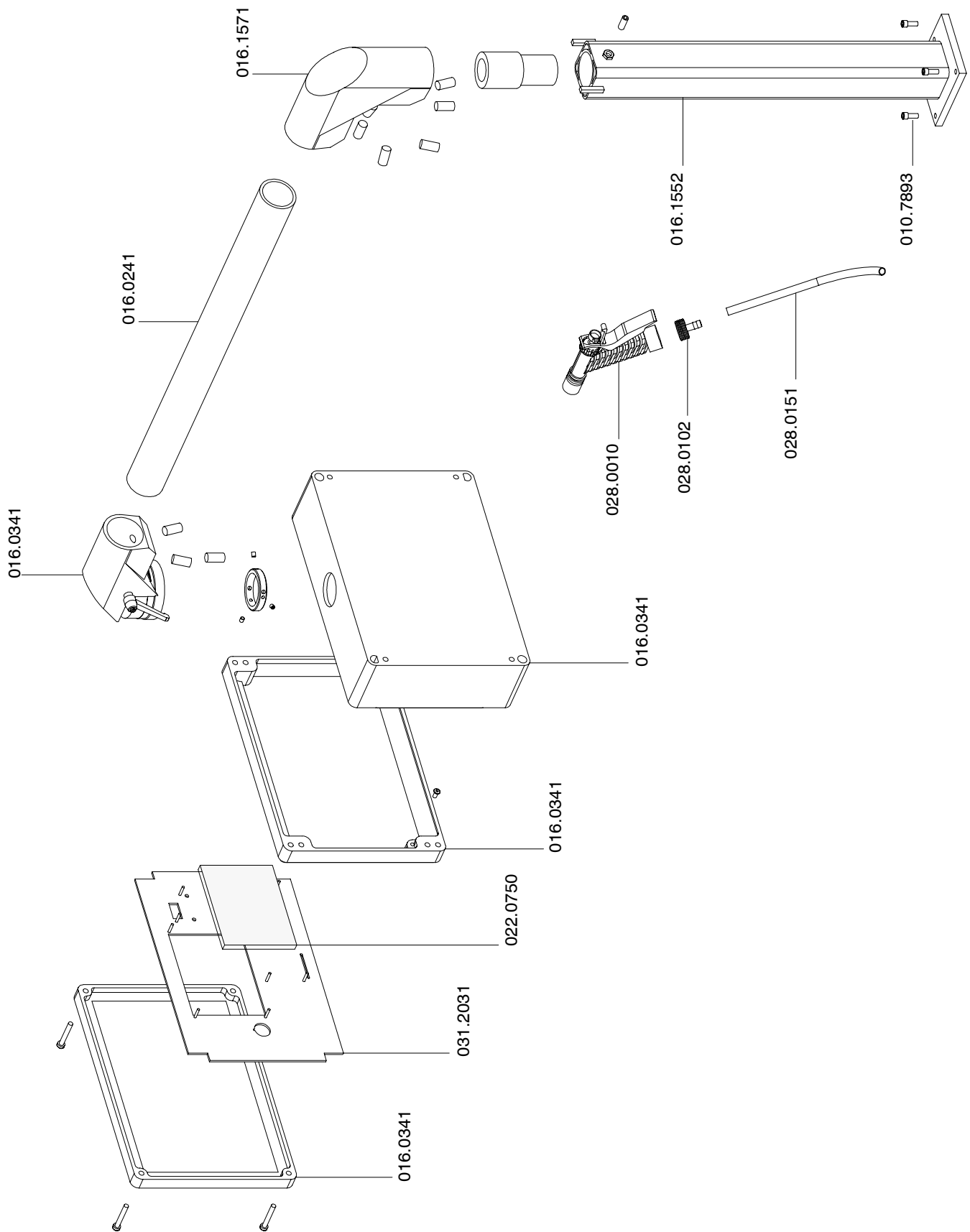
5.2.1 - Head assembly



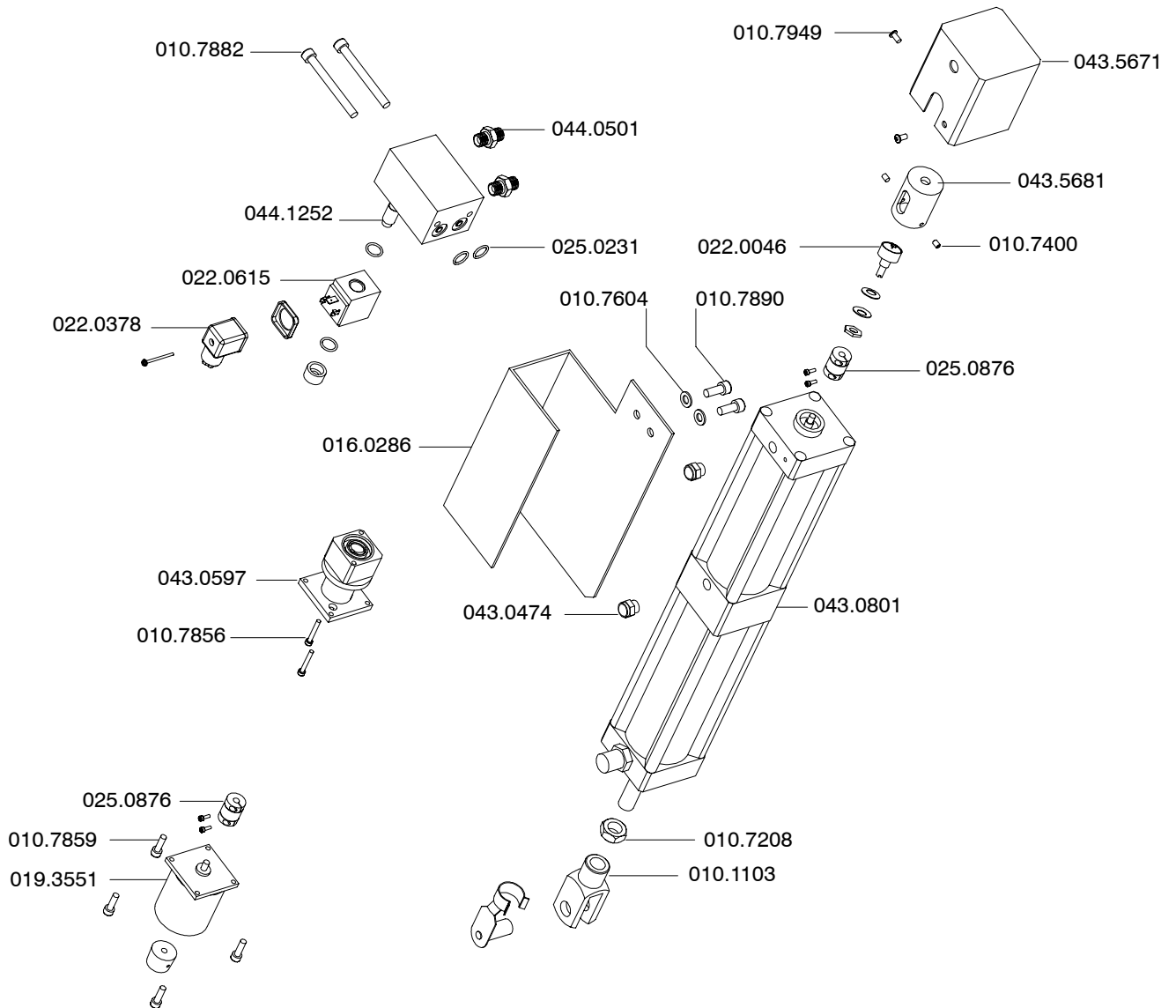
5.2.2 - Vice assembly



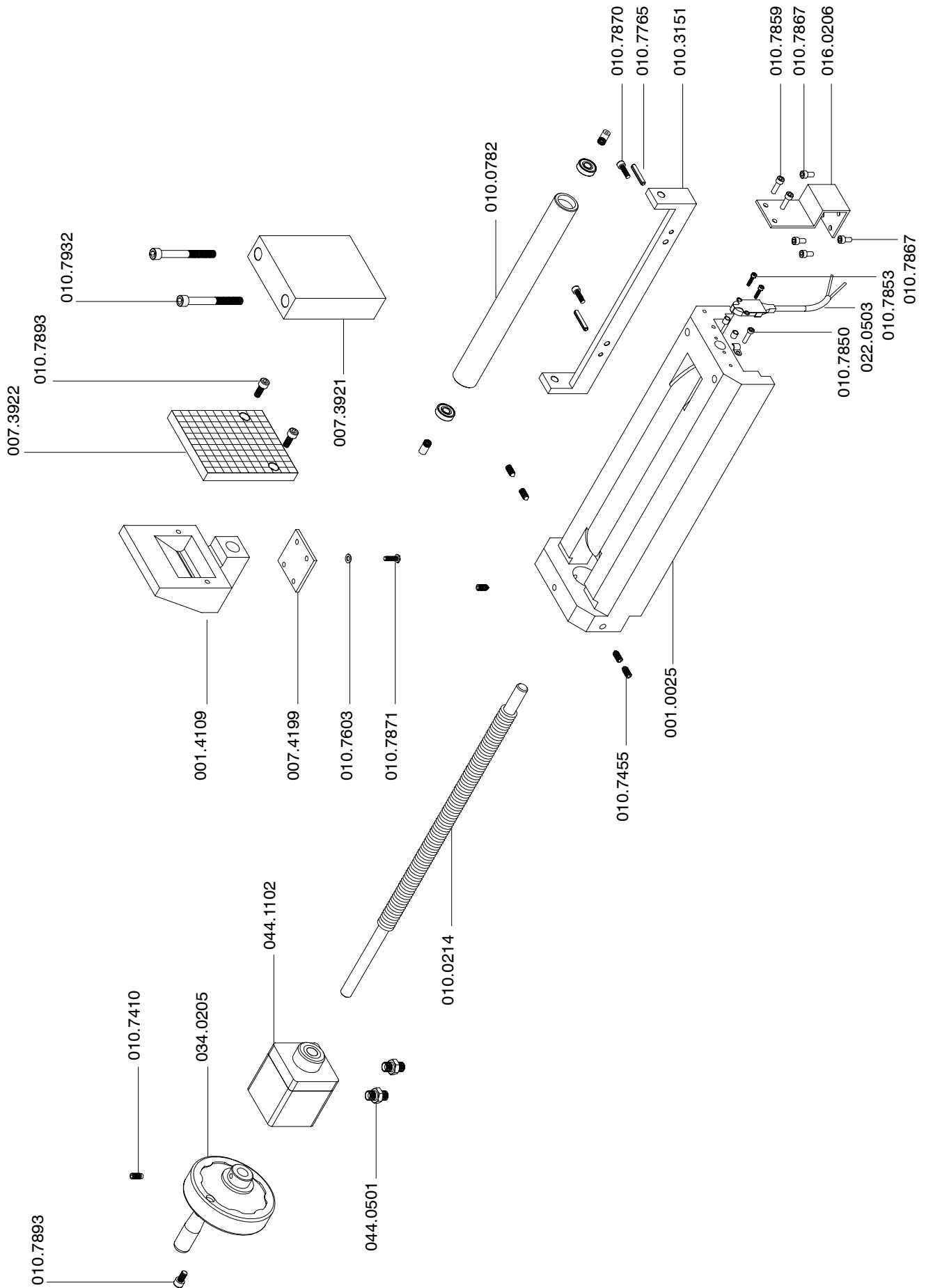
5.2.3 - Programming and control console



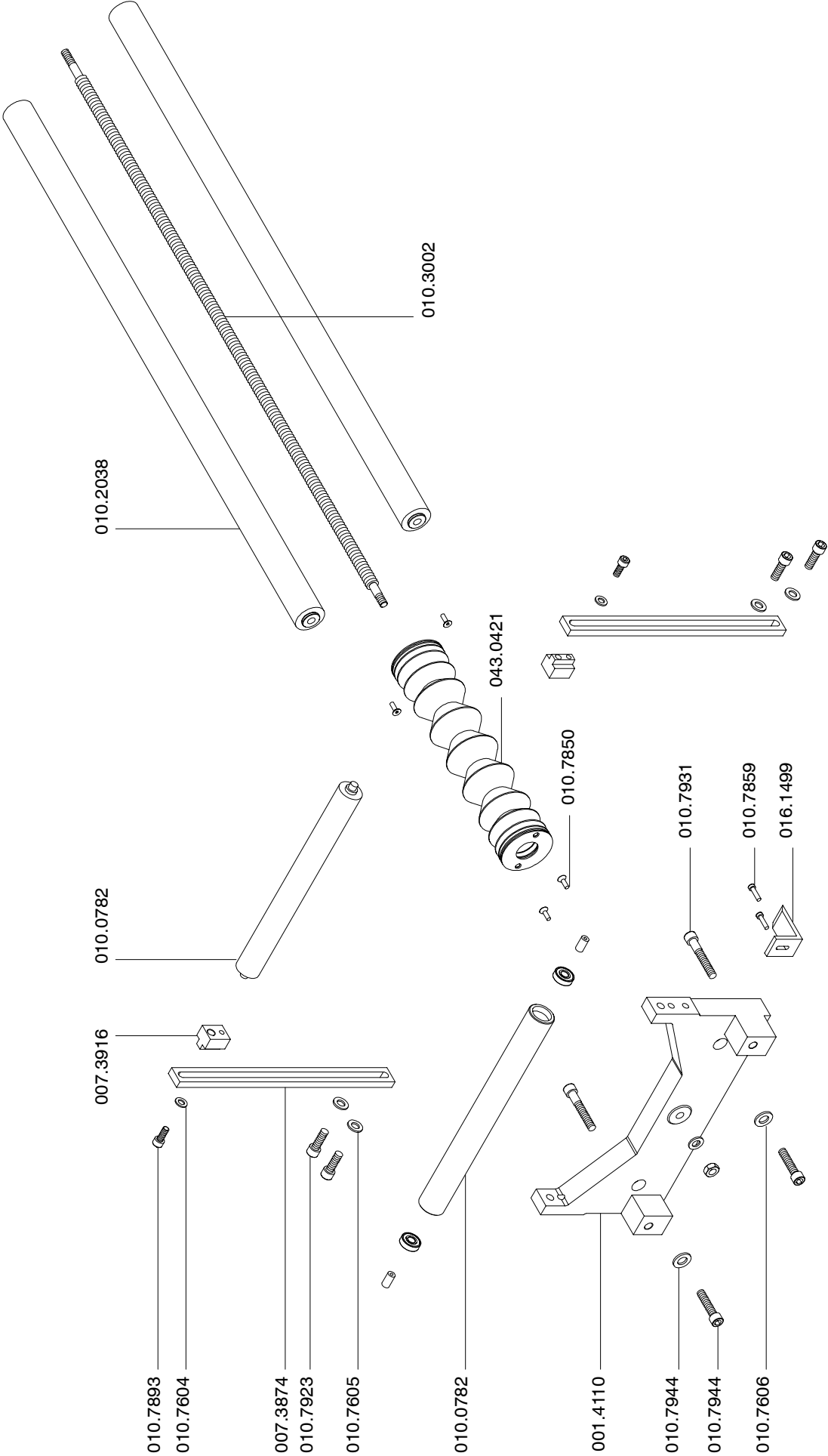
5.2.4 - Hydraulic cylinder



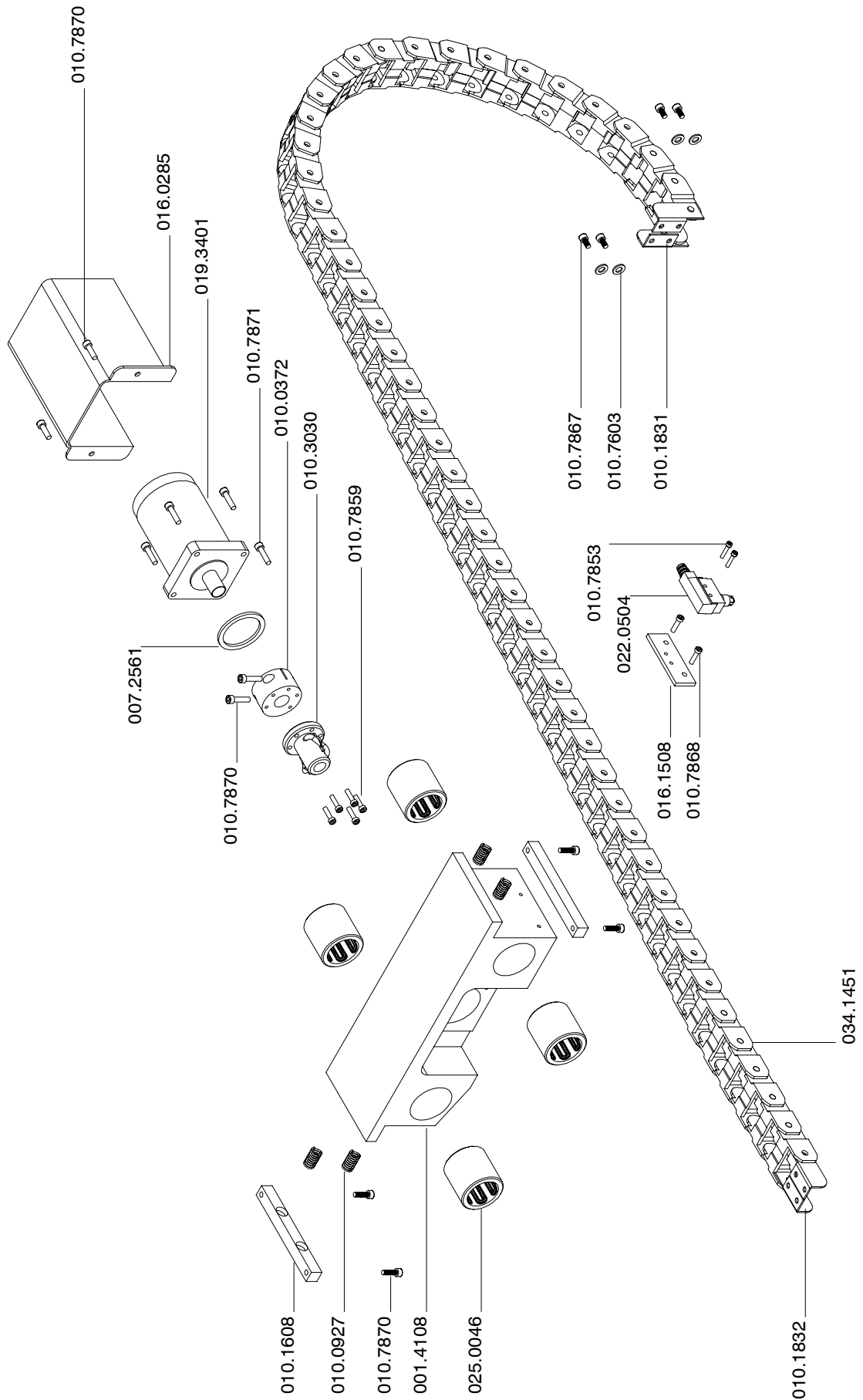
5.2.5 - Feeder



Feeder (cont.d)



Feeder (cont.d)



Feeder (cont.d)

