
TU ISO E

TOE 80 Control Board

OMRON Inverters

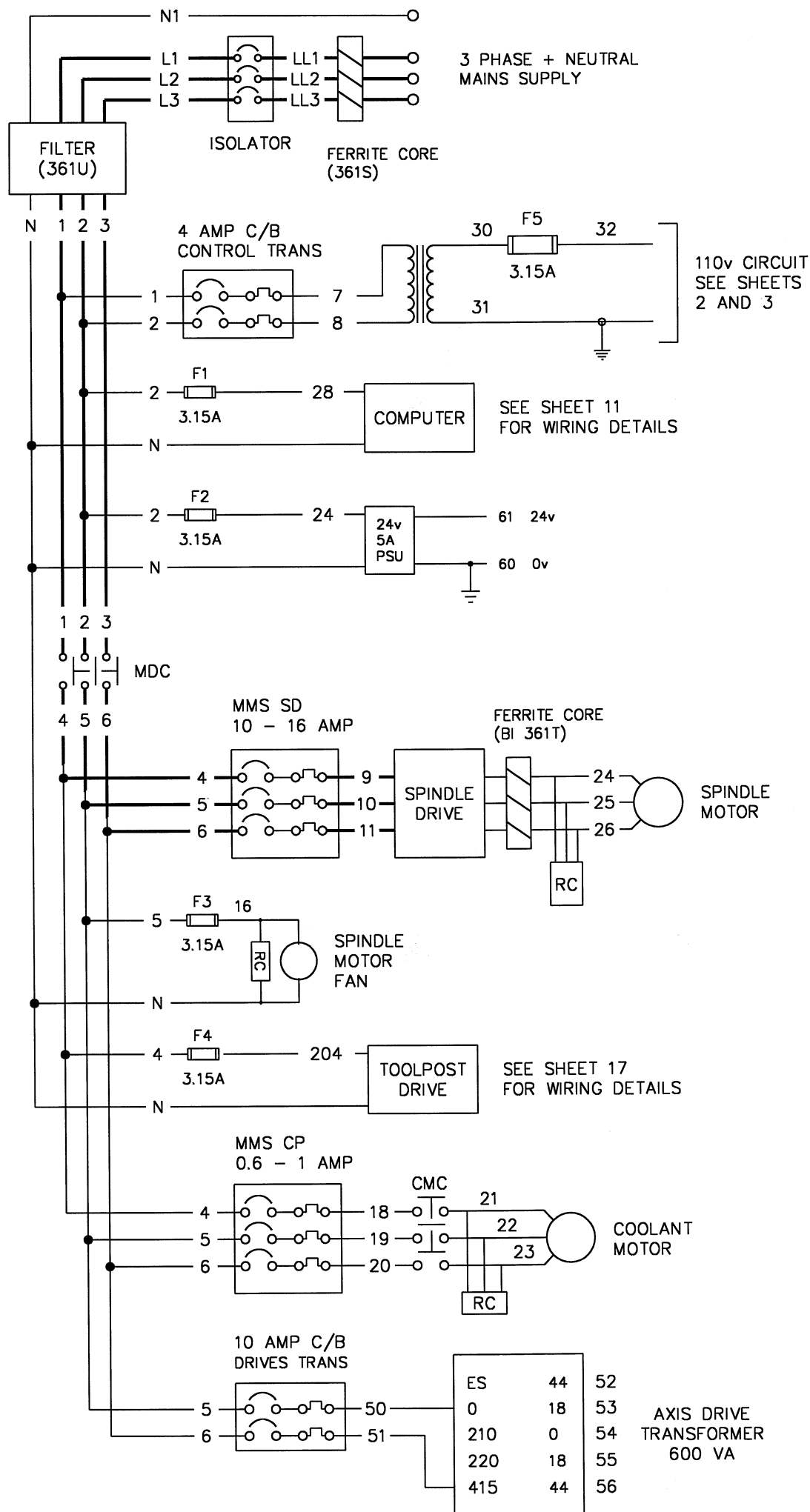
TU150 E
TOE 80 Toolpost and OMRON inverter

<u>DRAWING No</u>	<u>DRAWING TITLE</u>
AC8 - MT 1	POWER SCHEMATIC
AC8 - MT 2	110V SCHEMATIC
AC8 - M 3	110V SCHEMATIC SOLENOID WIRING
AC8 - MT 4	STANDARD I/O PINS 1 TO 25
AC8 - MT 5	STANDARD I/O PINS 26 TO 50
AC8 - MT 6	ELECTRICAL BOX LAYOUT
AC8 - MT 7	DOOR PANEL WIRING. CONTACTORS + MMS'S
AC8 - MT 8	MAIN PANEL WIRING TERMINALS AND RELAYS
AC8 - MT 9	ADDITIONAL I/O CONNECTOR
AC8 - MT 10	EMERGENCY STOP CIRCUIT
AC8 - M 11 A	COMPUTER CONNECTIONS
AC8 - M 12 A	SPINDLE DRIVE DETAILS
AC8 - M 13	MONITOR HOUSING
AC8 - M 14	OPTIMISED RACK DETAILS
AC8 - M 15	TRANSFORMER WIRING DIAGRAM
AC8 - M 16	DRAWING NOT ISSUED (DM8 TOOLPOST WIRING DETAILS)
AC8 - MT 17	TOOLPOST CONTROL DETAILS INVERTER AND CONTROL BOARD WIRING
AC8 - M 18	SADDLE AND HEADSTOCK CONNECTION BOXES
AC8 - M 19	LIMIT SWITCH AND MOTOR WIRING
AC8 - M 20	GUARD INTERLOCK DETAILS
AC8 - MT 21	BARUFFALDI CONTROL BOARD WIRING PINS 1 - 24
AC8 - MT 22	BARUFFALDI CONTROL BOARD WIRING PINS 25 - 48

NOTE : 2.5mm BLACK FROM

MAINS TERMINAL TO SPINDLE DRIVE UNIT
1.5mm BLACK FOR REST

RC

SPINDLE MOTOR SUPPRESSOR (430D)
SPINDLE MOTOR FAN SUPPRESSOR (RS 210-364)
COOLANT MOTOR SUPPRESSOR (430C)TU150 E
POWER SCHEMATICSHEET 1
TU150E
OMRON

IF IN DOUBT ASK

DENFORD LIMITED BRIGHOUSE WEST YORKSHIRE

DRN BY A McHENRY

DATE 9-3-02

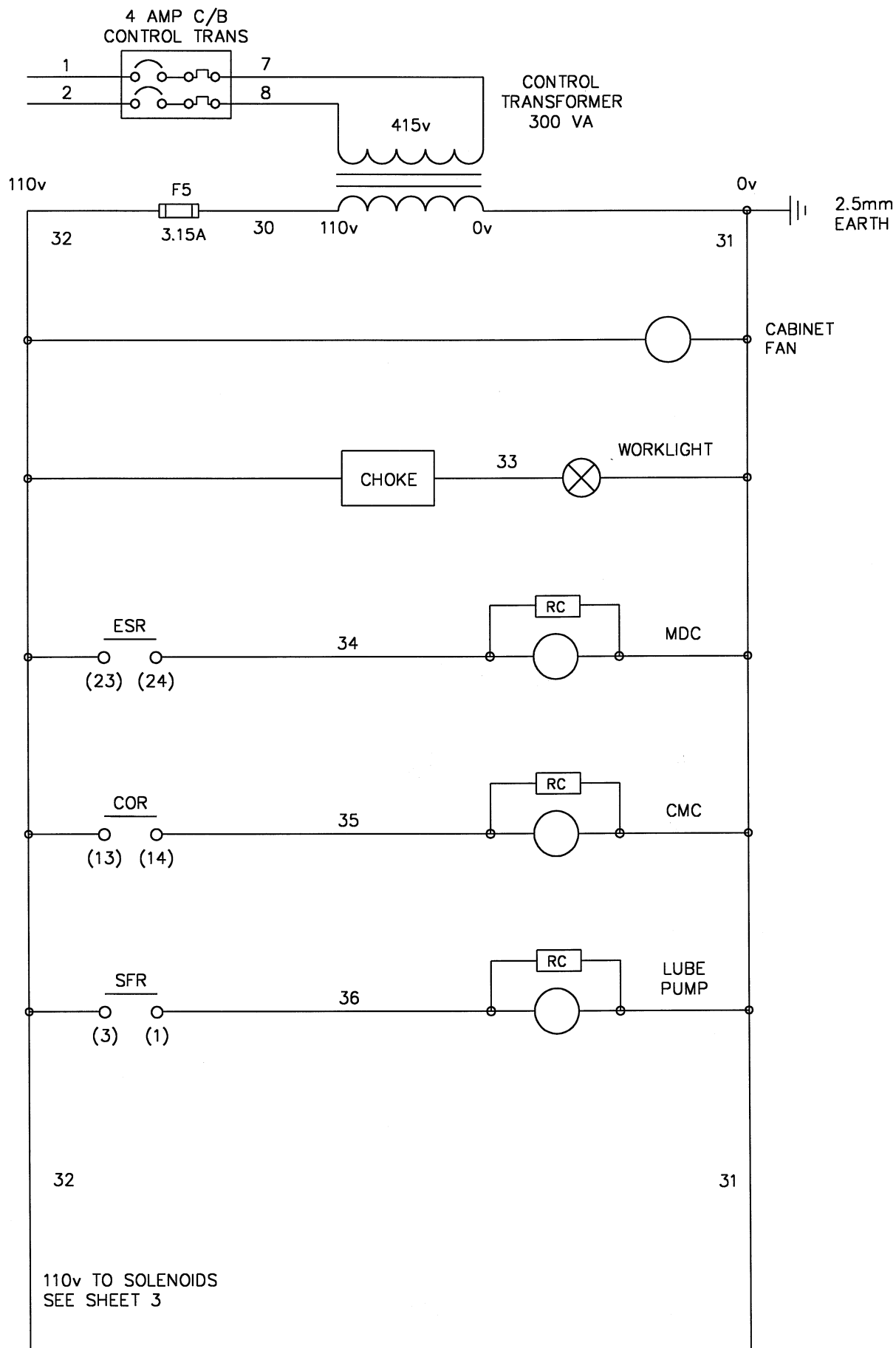
AC8 - MT2

TU150 E
110v SCHEMATIC

SHEET 2

TU150E

OMRON



IF IN DOUBT ASK

DENFORD LIMITED BRIGHOUSE WEST YORKSHIRE

DRN BY A McHENRY

DATE 9-1-02

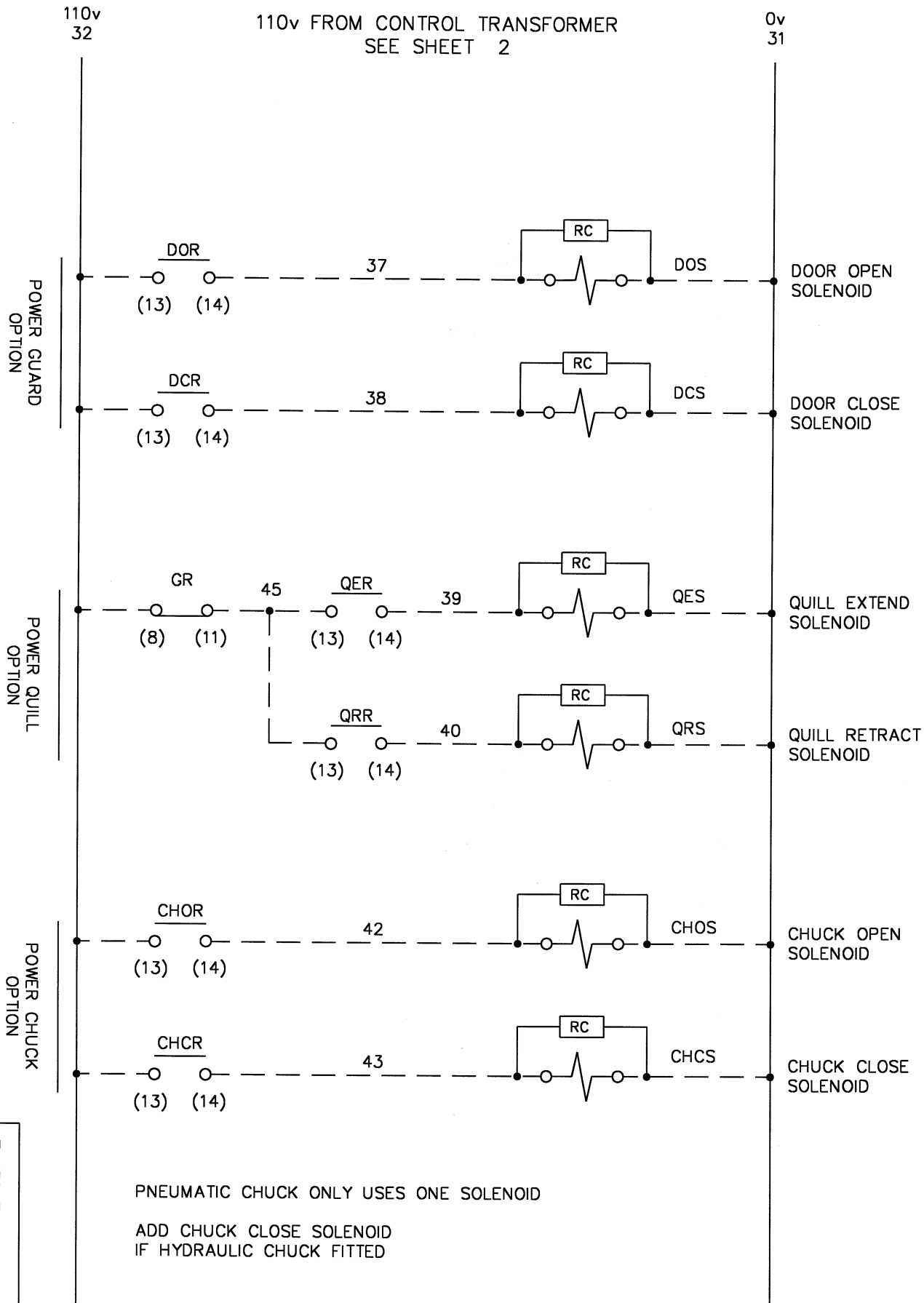
AC8 - M3

TU150 E
SOLENOID
WIRING

SHEET 3

TU150E

OMRON



IF IN DOUBT ASK

DENFORD LIMITED BRIGHOUSE WEST YORKSHIRE

DRN BY A McHENRY

DATE 13-3-02

AC8 - MT4

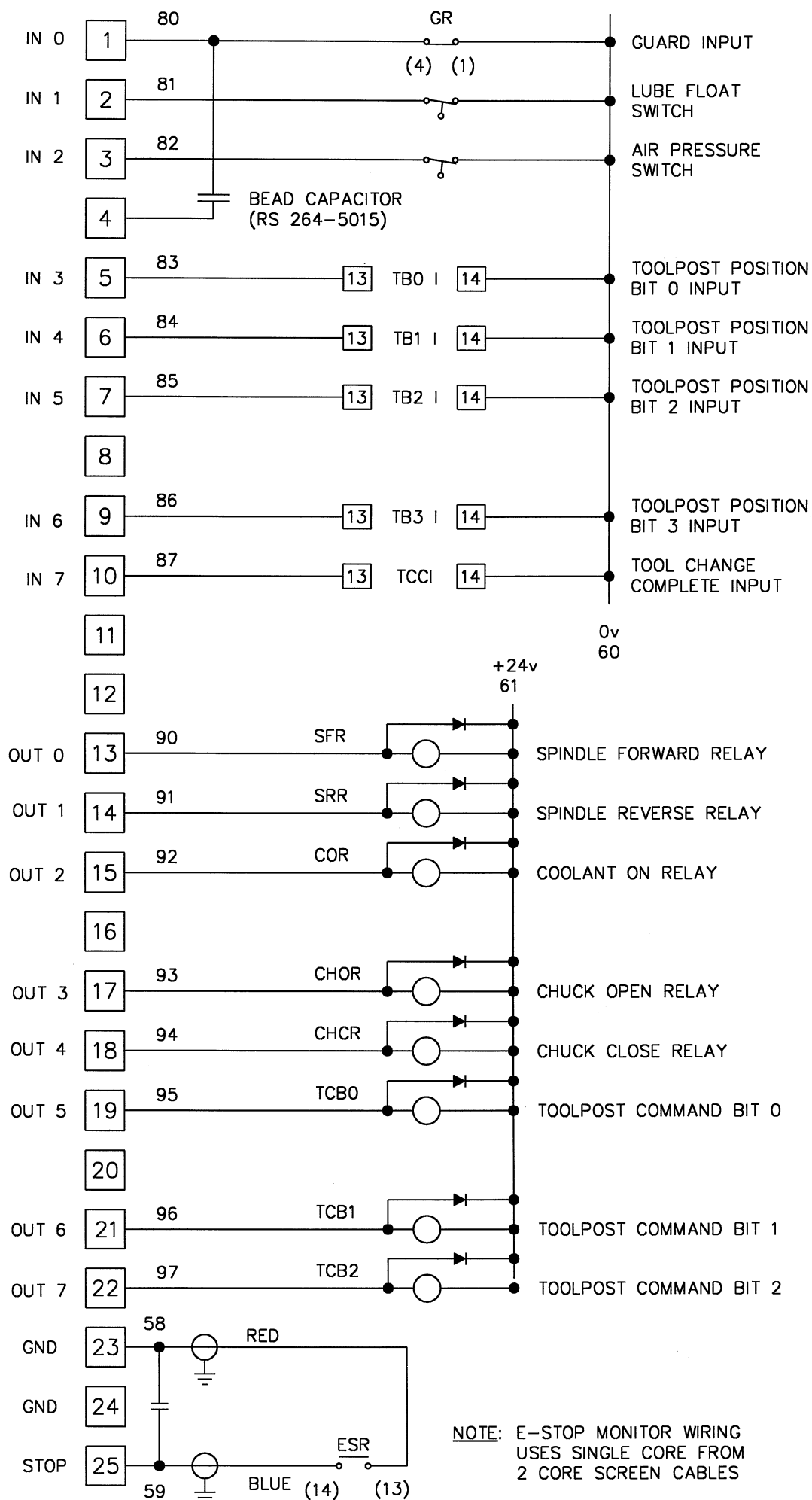
50 WAY INTERFACE UNIT STANDARD I/O

TU150 E
STANDARD I/O
1 - 25

SHEET 4

TU150E

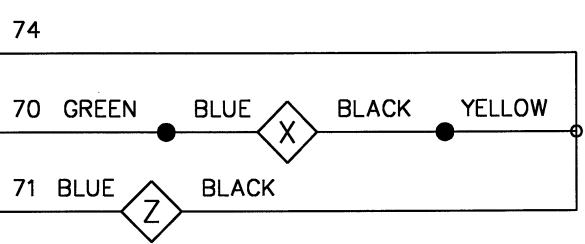
OMRON



IF IN DOUBT ASK

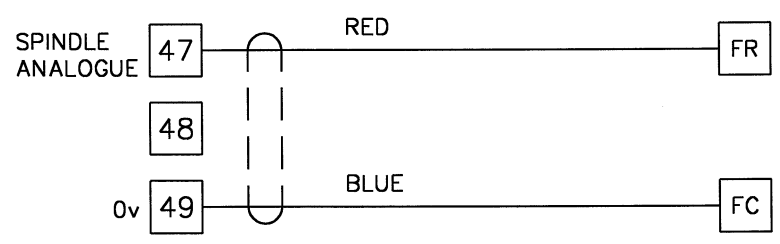
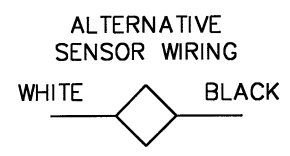
50 WAY INTERFACE UNIT STANDARD I/O

- 26
- PULSE IN 27
- 28
- DIRECTION IN 29
- RESET IN 30
- RST CNTR 31
- 32
- +12v 33
- +12v 34
- HOME 0 35
- HOME 1 36
- HOME 2 37
- HOME 3 38
- 39
- 40
- +5v 41
- +5v 42
- 0v 43
- 44
- 45
- 46
- SPINDLE ANALOGUE 47
- 48
- 0v 49
- 10v 50



DATUM SENSORS

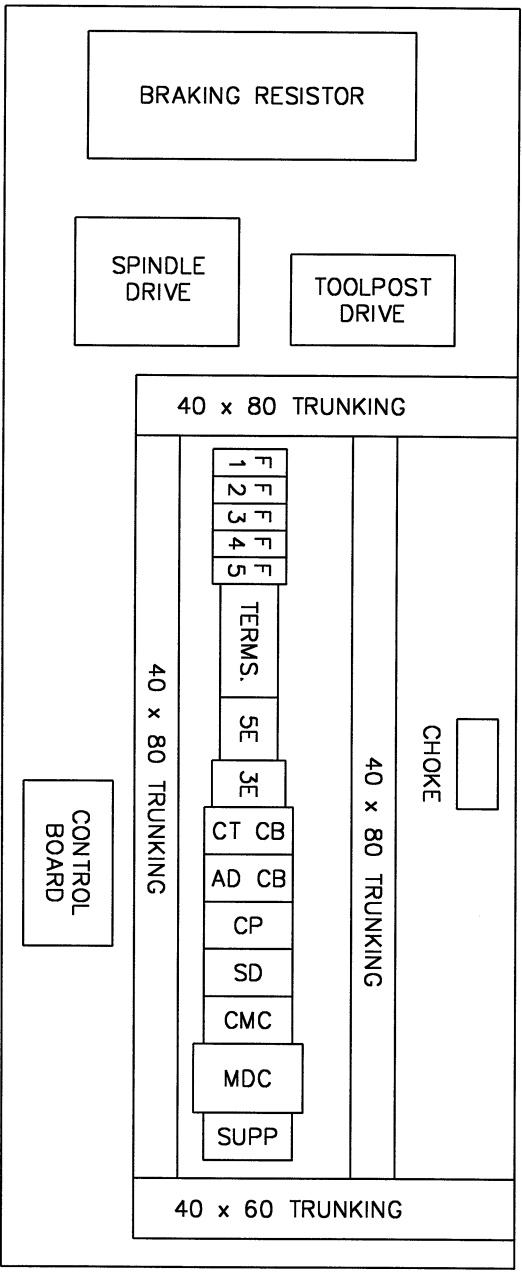
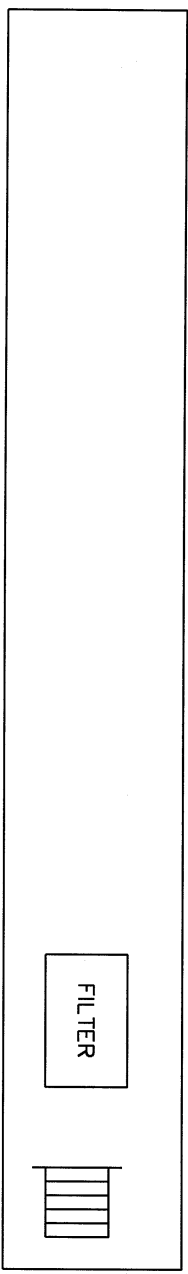
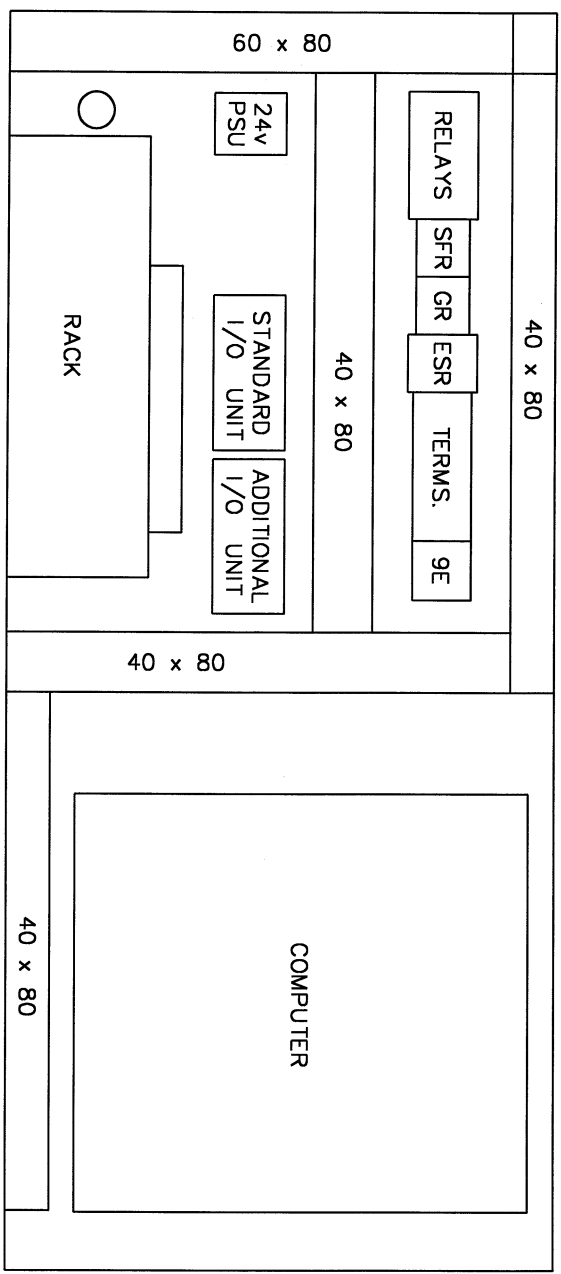
TERMINALS IN SADDLE CONNECTION BOX SEE SHEET 18



SPINDLE DRIVE TERMINALS SEE SHEET 12

2 CORE SCREEN NOT EARTHED

IF IN DOUBT ASK

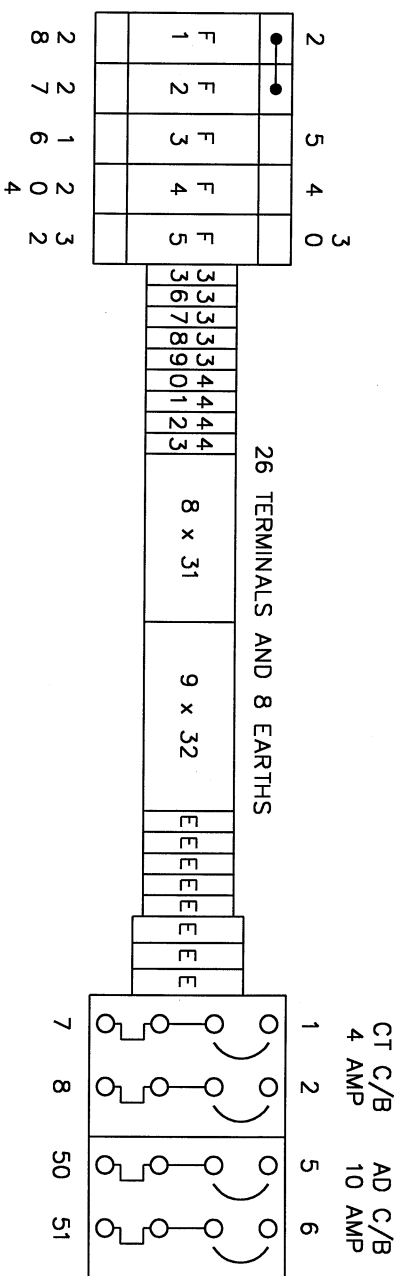


MAINS
TERMINALS

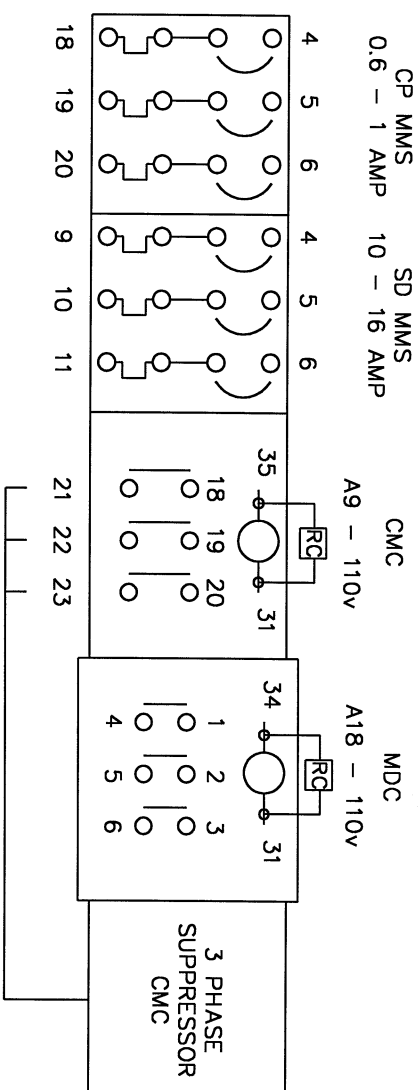
- STANDARD I/O SHEETS 4 AND 5
- DOOR PANEL WIRING SHEET 7
- RELAY AND TERMINAL DETAILS SHEET 8
- ADDITIONAL I/O SHEET 9
- COMPUTER CABLES SHEET 11
- SPINDLE DRIVE DETAILS SHEET 12
- RACK DETAILS SHEET 14
- TRANSFORMER DETAILS SHEET 15
- TOOLPOST DRIVE DETAILS SHEET 17
- TOOLPOST CONTROL BOARD SHEETS 21 AND 22

SUPP = 3 PHASE
SUPPRESSOR FOR CMC

IF IN DOUBT ASK



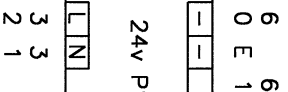
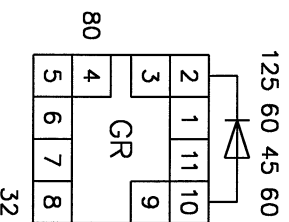
- F1 3.15A COMPUTER
- F2 3.15A 24V POWER SUPPLY
- F3 3.15A SPINDLE MOTOR FAN
- F4 3.15A TOOLPOST DRIVE
- F5 3.15A 110V CONTROL



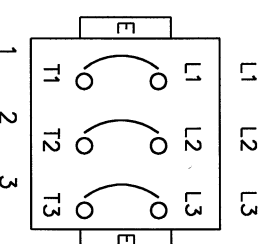
POWER	POWER	TAILSTOCK
CHUCK	DOOR	RELAYS
STANDARD	RELAYS	RELAYS
RELAYS		



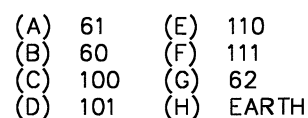
60
E
61



LINK (0.5mm GREY)



QM2 = 8 WAY ROUND
CONNECTOR FOR
FOOTSWITCH



61
24v

AXIS LIMIT
OVERRIDE P/B

THERMAL GOES TO
TOOLPOST CONTROL BOARD
SEE SHEETS 17 AND 22

E-STOP
CONTACT 2

REMOVE LINK
IF REMOTE
E-STOP FITTED

(A) (G)
REMOTE
E-STOP

OVERTRAVEL SWITCHES

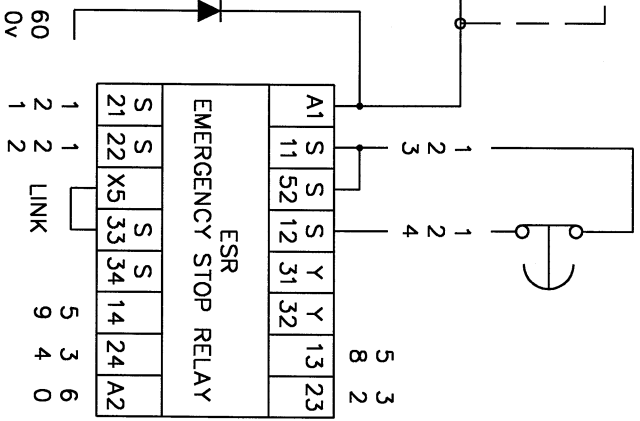
TOOLPOST
THERMAL

TERMINALS
ON 24 WAY
TOOLPOST
CONNECTOR
SEE SHEET 15

8 WAY ROUND QM
CONNECTOR FOR
AUXILIARIES

- (A) 61 (E) 110
- (B) 60 (F) 111
- (C) 100 (G) 62
- (D) 101 (H) EARTH

0.5mm BLUE
0.5mm EARTH



E-STOP
CONTACT 1

IF IN DOUBT ASK

DENFORD LIMITED BRIGHOUSE WEST YORKSHIRE

DRN BY A MCHENRY

DATE 19-3-02

AC8 - MT10

TU150 E
EMERGENCY STOP
CIRCUIT

SHEET 10

TU150E

OMRON

24v SUPPLY
TO MONITOR

« 39 BROWN 61

« 40 BLUE 60

« 41 EARTH



MOUSE CONNECTIONS
SAME AS KEYBOARD

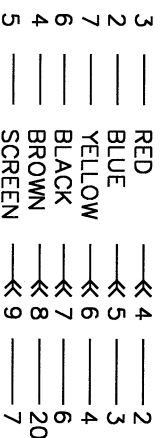
SEE BELOW

COM 2

KEYPAD

COMPUTER
9 WAY D TYPE
FEMALE PINS
(RS 472-843)

25 WAY D TYPE
MALE PINS
(RS 470-910)



8 CORE SCREEN

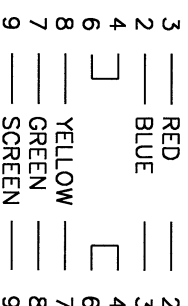
COM 3

COMPUTER

RACK SERIAL LINK

9 WAY D TYPE
FEMALE PINS
(RS 472-843)

9 WAY D TYPE
FEMALE PINS
(RS 472-843)



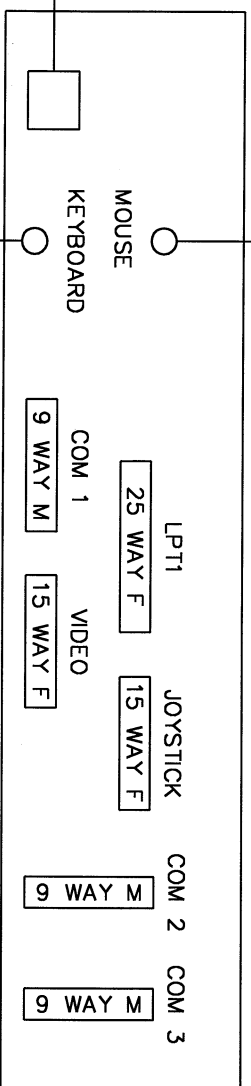
4 CORE SCREEN

1.5m

« 42 WAY CONNECTOR
FOR MONITOR HOUSING
SEE SHEET 13

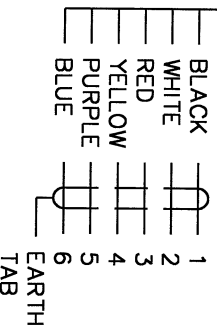
MAINS IN
3 WAY PLUG

(RS 488-905)

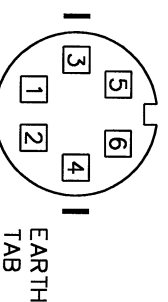


(RS 463-502) PRE-MADE CABLE

6 WAY MINI-DIN SOCKET
CABINET END
(RS 183-1798)



VIEW FROM BACK
OF SOCKET

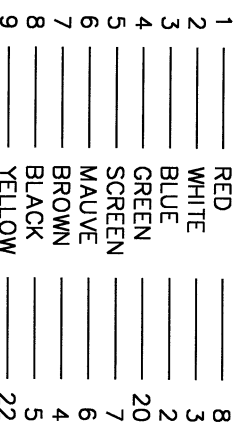


CRIMP SOCKETS
(RS 183-1811)

COMPUTER

COM 1

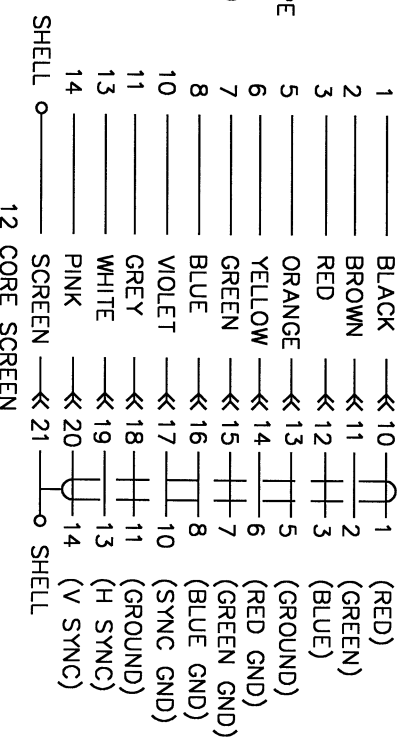
9 WAY D TYPE
FEMALE PINS
(RS 472-843)



8 CORE SCREEN
0.45m

COMPUTER
HIGH DENSITY 15 WAY
MALE PINS
(RS 481-459)

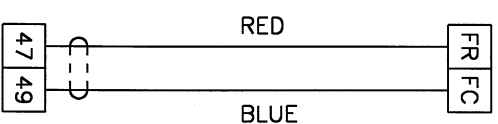
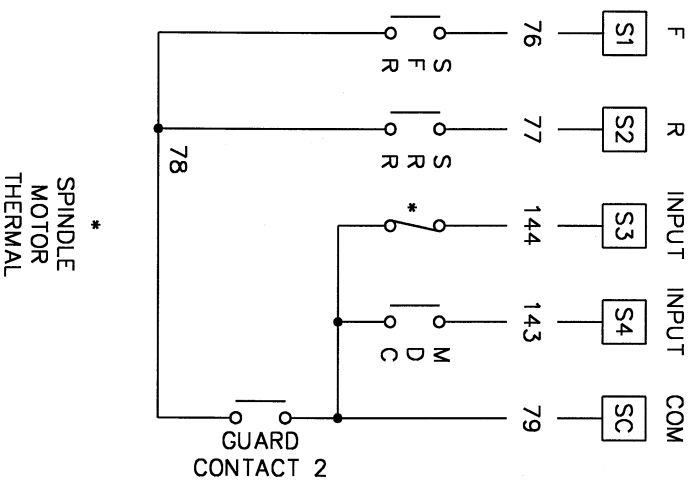
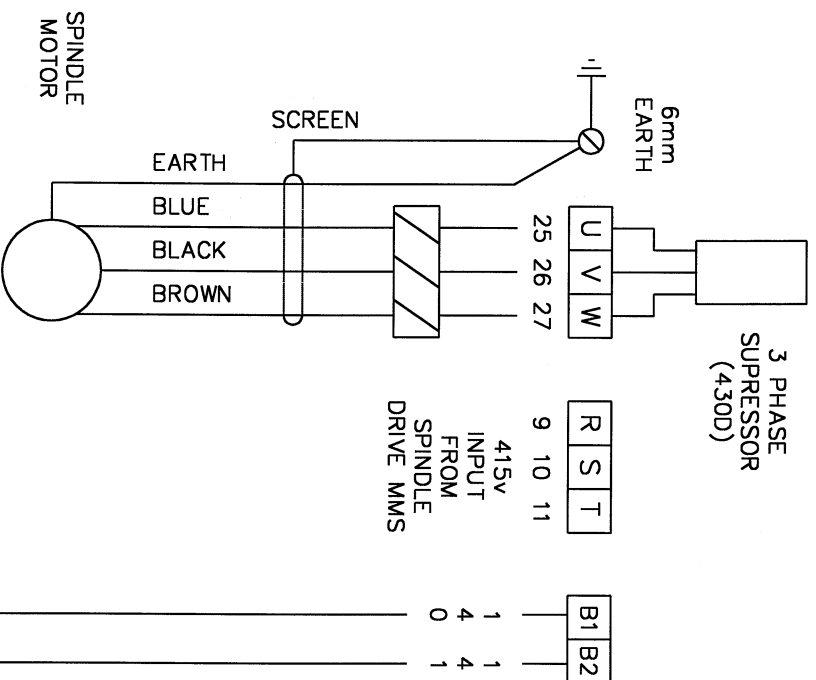
MONITOR
HIGH DENSITY 15 WAY
FEMALE PINS
(RS 481-465)



SPINDLE DRIVE

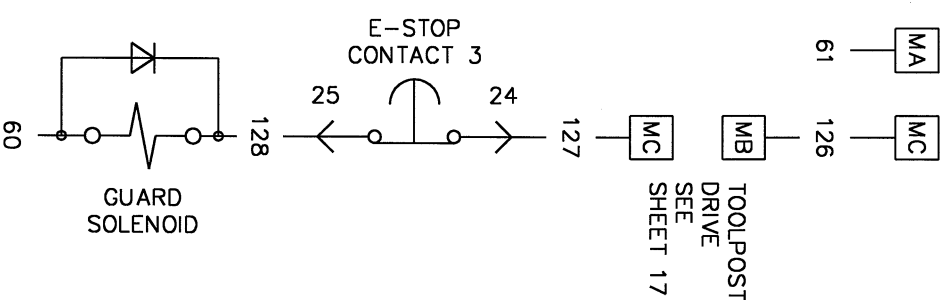
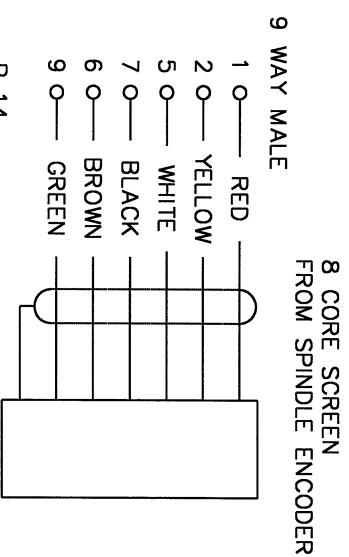
REST OF TERMINALS NOT USED

POWER WIRING 2.5mm BLACK
SIGNAL WIRING 0.2mm BLUE



SPINDLE ANALOGUE
FROM STD I/O UNIT
SEE SHEET 5

SPINDLE BRAKING
RESISTOR
ON TRANSFORMER PLATE
SHEET 15



Ø 4mm EARTH

PIN COLOUR WIRE

1	BROWN		1mm 3 CORE FLEX TO PC (NOT USED WITH) (FLAT SCREEN MONITOR)
2	BLUE		
3	EARTH	E	
4	RED	(2)	
5	BLUE	(3)	KEYPAD 8 CORE SCREEN
6	YELLOW	(4)	
7	BLACK	(6)	
8	BROWN	(20)	
9	SCREEN	(7)	
10	BLACK	(1)	
11	BROWN	(2)	
12	RED	(3)	
13	ORANGE	(5)	MONITOR SIGNALS 12 CORE SCREEN
14	YELLOW	(6)	
15	GREEN	(7)	
16	BLUE	(8)	
17	VIOLET	(10)	
18	GREY	(11)	
19	WHITE	(13)	
20	PINK	(14)	
21	SCREEN		

SCREEN TO SHELL

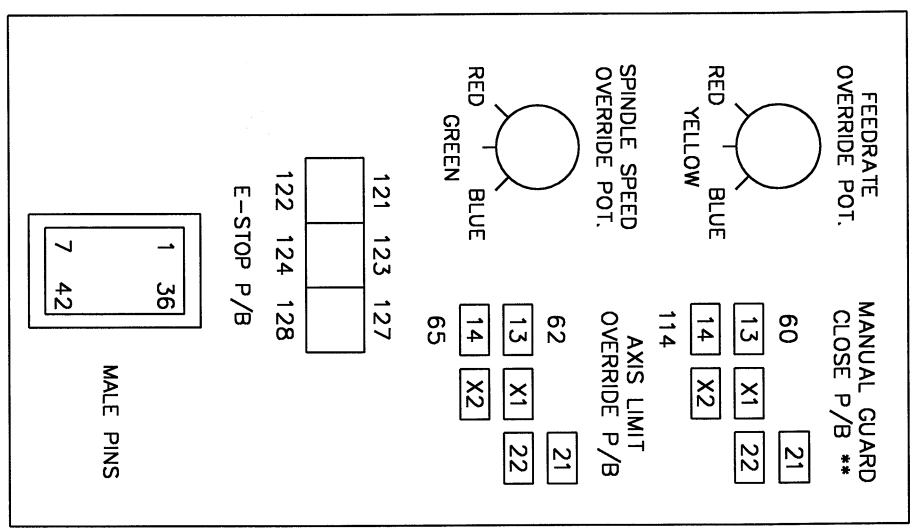
* 8 CORE SCREEN 4 CORE AND 2 CORES
TO PUSHBUTTONS TO MAIN PANEL

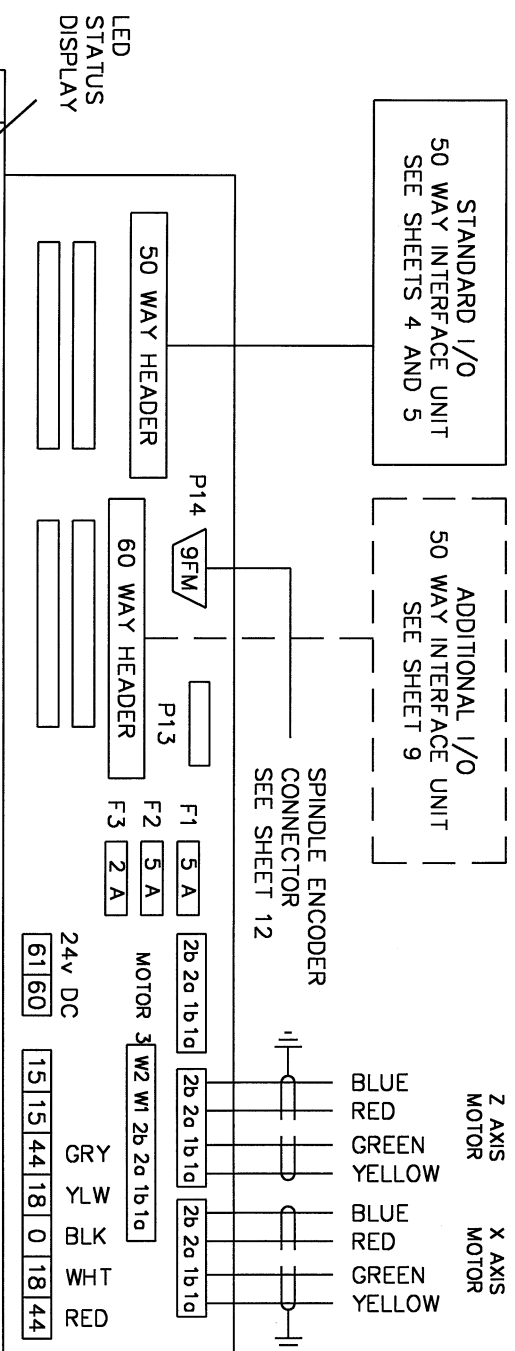
PIN COLOUR WIRE

22	BLACK*	RED	121	E-STOP CONTACT 1	2 CORE SCREEN
23	BROWN*	BLUE	122		
24	RED*	RED	123	E-STOP CONTACT 2	2 CORE SCREEN
25	YELLOW*	BLUE	124		
26	GREEN*	RED	127	E-STOP CONTACT 3	4 CORE SCREEN
27	BLUE*	BLUE	128		
28	VIOLET*	YELLOW	62	AXIS OVERRIDE	
29	WHITE*	GREEN	65		
30	RED		136	SPINDLE AND FEEDRATE OVERRIDE POTS	4 CORE SCREEN
31	BLUE		137		
32	YELLOW		134		
33	GREEN		135		
34	RED		60	MANUAL DOOR CLOSE P/B **	2 CORE SCREEN
35	BLUE		114		
36	BROWN		25	80mm MONITOR HOUSING FAN (OPTION)	0.5mm SINGLES
37	BLUE		24		
38	EARTH		E		
39	BROWN		61	24V TO FLAT SCREEN MONITOR	1mm 3 CORE FLEX TO TERMINALS
40	BLUE		60		
41	EARTH		E		

MONITOR WIRES
RED (24V) BROWN
BLACK (0V) BLUE

(** ONLY FITTED IF)
(MACHINE HAS POWER GUARD)





Z AXIS MOTOR
BLUE
RED
GREEN
YELLOW

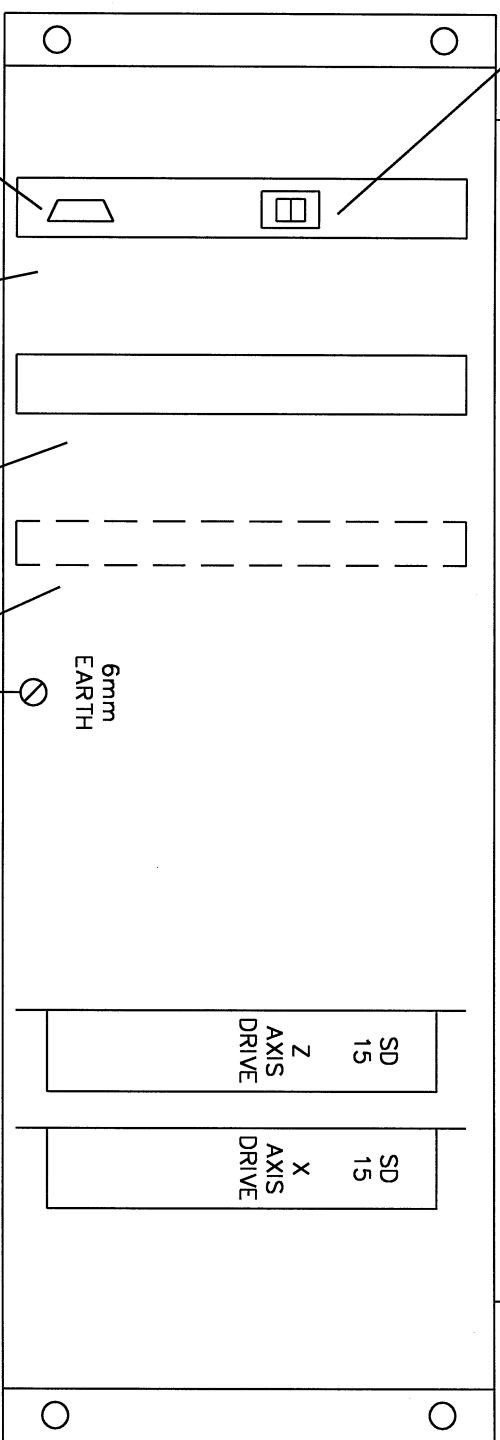
X AXIS MOTOR
BLUE
RED
GREEN
YELLOW

1.5mm EARTH

ES	0	44	RED	52
	210	18	WHITE	53
	220	0	BLACK	54
	230	18	YELLOW	55
	380	18	YELLOW	55
	415	44	GREY	56
	440			

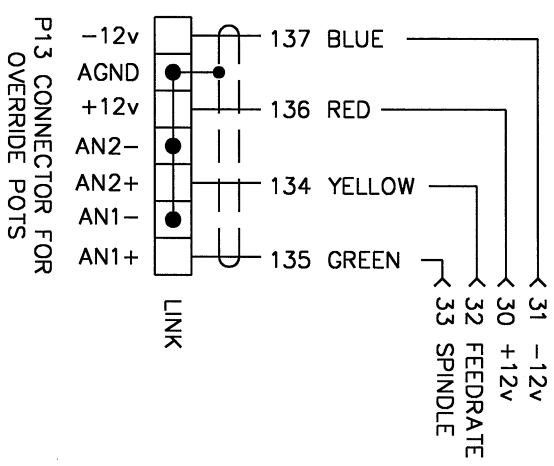
AXIS DRIVE TRANSFORMER

4 CORE FROM MONITOR HOUSING
SEE SHEET 13



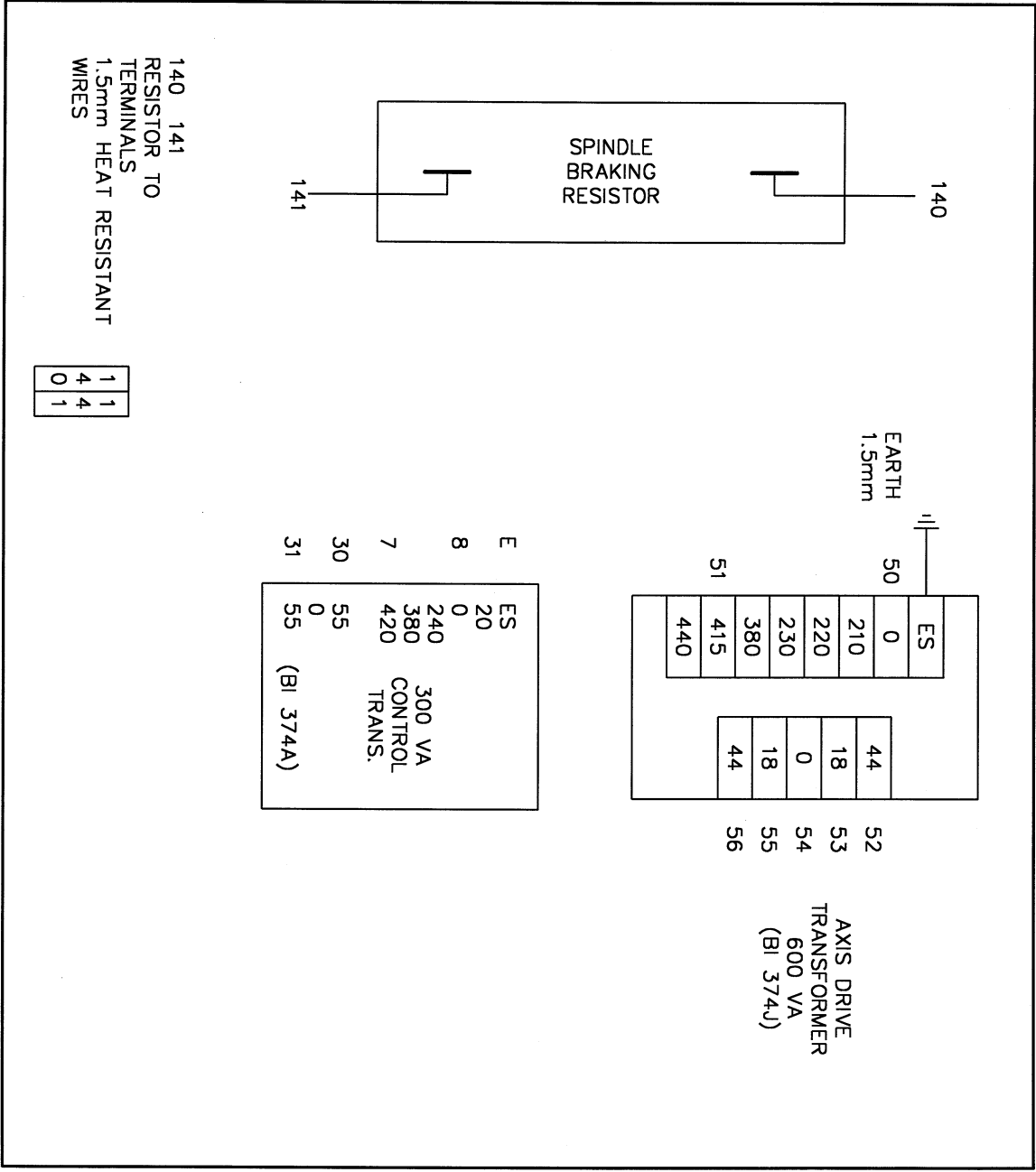
RACK COMPUTER NUMBER
(BI 00432N)

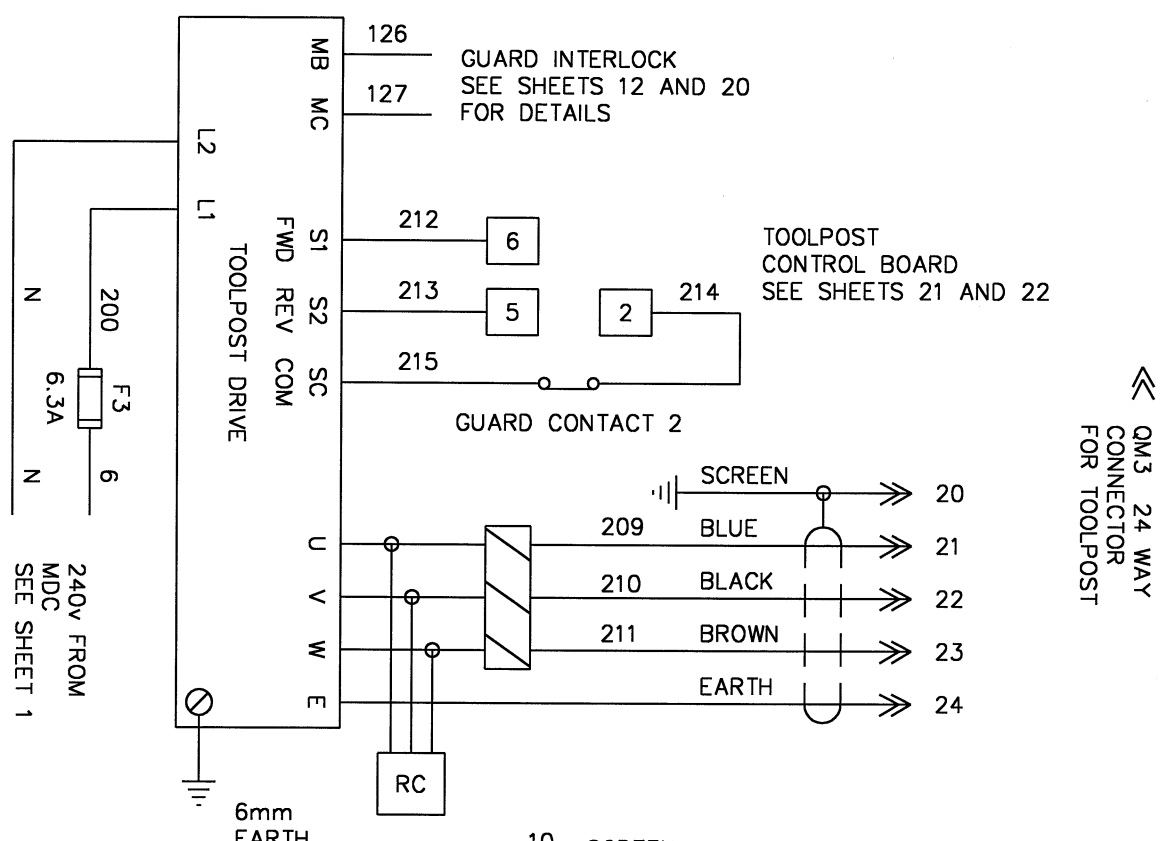
FUSES ON RACK
F1 +44V SUPPLY TO STEPPER DRIVES (BI 00339Z)
F2 -44V SUPPLY TO STEPPER DRIVES
F3 15V SUPPLY TO 4th AXIS STEPPER DRIVE



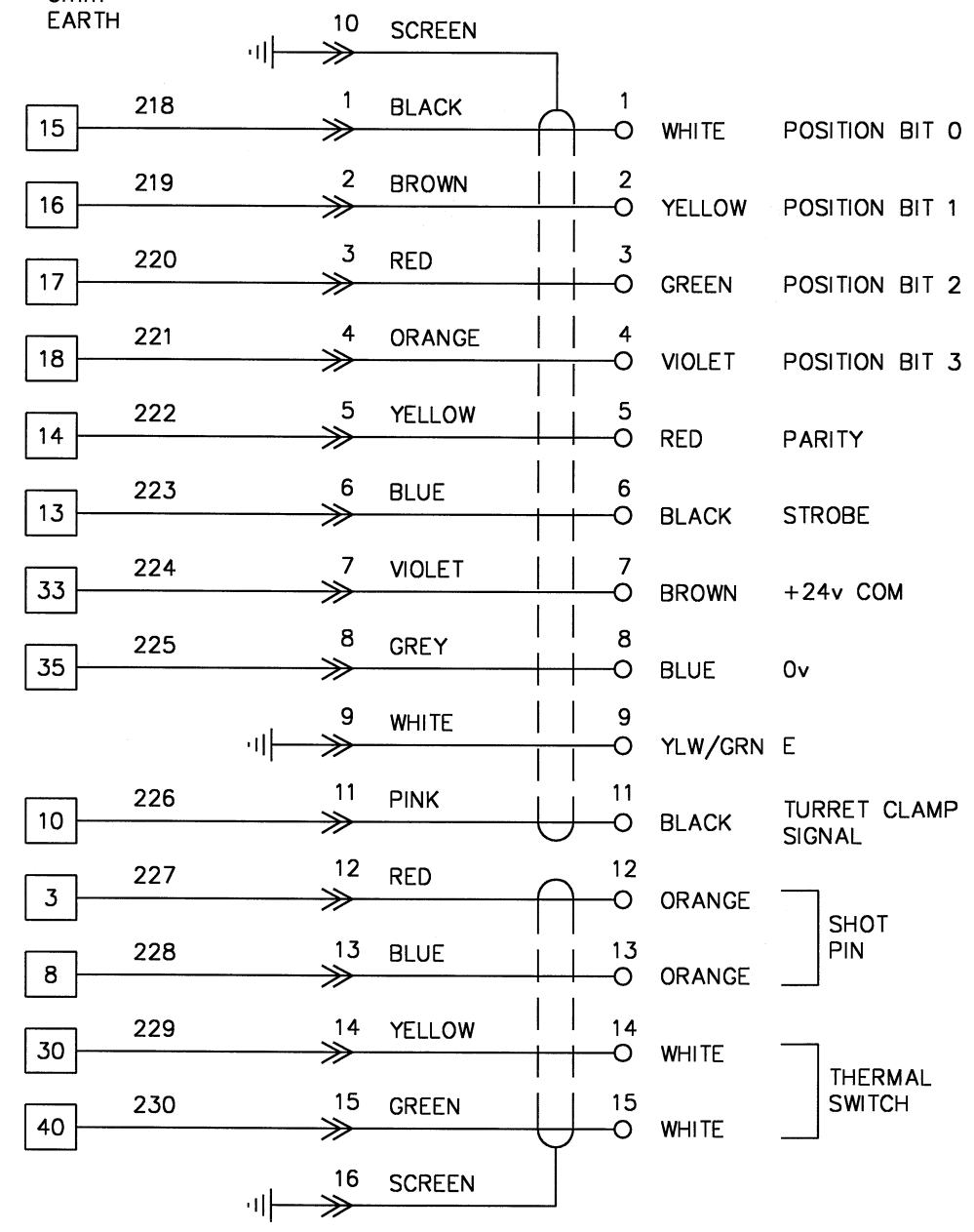
TU150 E RACK DETAILS		SHEET 14
		TU150E
		OMRON

IF TRANSFORMER PLATE
NOT FITTED
RESISTOR AND TRANSFORMERS
IN MAIN PANEL
WIRE NUMBERS DO NOT CHANGE



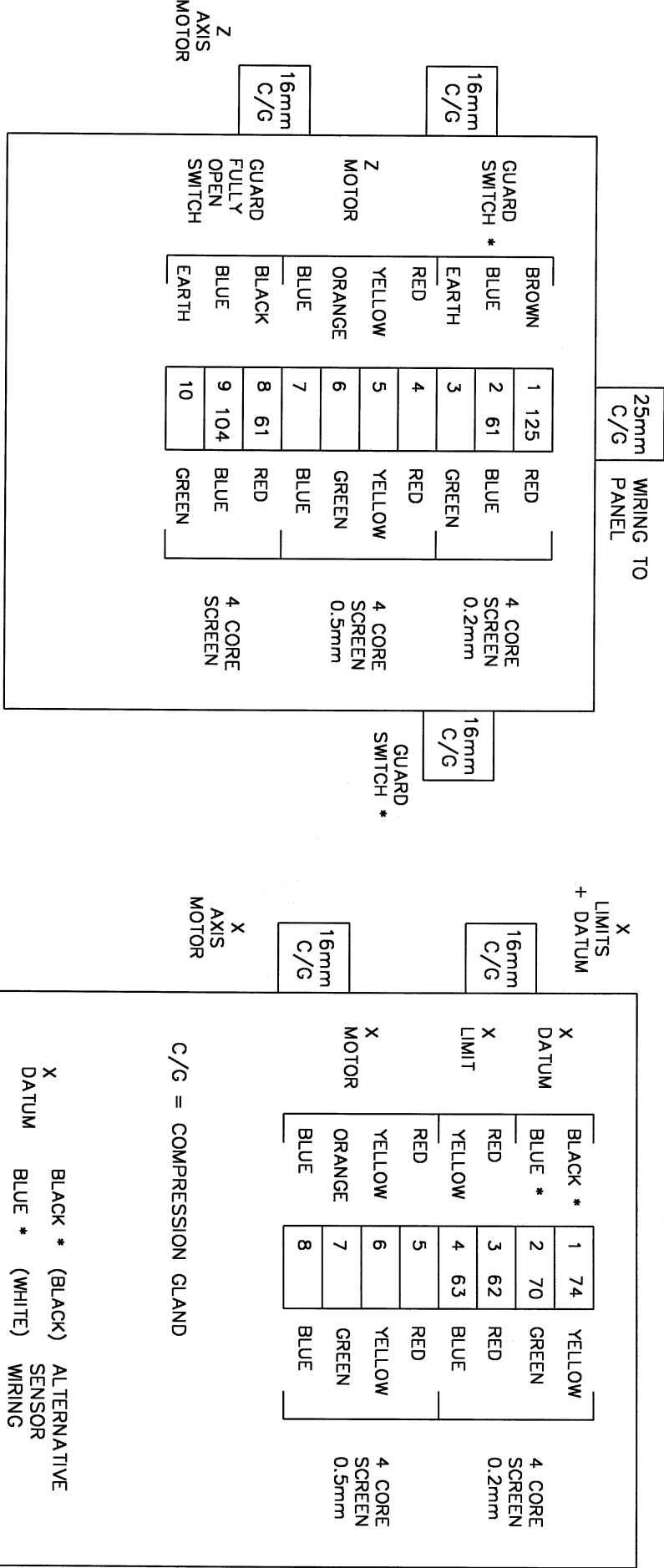


TERMINALS ON TOOLPOST CONTROL BOARD
SEE SHEETS 21 AND 22



HEADSTOCK CONNECTION BOX
(AC4/508)

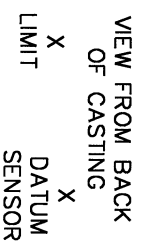
SADDLE CONNECTION BOX
(AC4/317)



NOTE *

IF GUARD INTERLOCK IS FITTED
THE GUARD SWITCH WIRING IS NOT USED

SEE SHEET 20 FOR DETAILS



* NOTE *
IF GUARD INTERLOCK FITTED
WIRE GUARD SWITCH AS SHEET 20

SADDLE CONNECTION BOX

ALTERNATIVE SENSOR WIRING	(BLACK)	X	BLACK	1 74	YELLOW
	(WHITE)	DATUM	BLUE	2 70	GREEN
		X	RED	3 62	RED
		LIMIT	YELLOW	4 63	BLUE
		X	RED	5	RED
		MOTOR	YELLOW	6	YELLOW
			ORANGE	7	GREEN
			BLUE	8	BLUE

4 CORE
SCREEN
0.2mm

4 CORE
SCREEN
0.5mm

HEADSTOCK CONNECTION BOX

GUARD SWITCH *	BROWN	1 125	RED	4 CORE SCREEN 0.2mm
	BLUE	2 61	BLUE	
	EARTH	3	GREEN	
	RED	4	RED	
Z MOTOR	YELLOW	5	YELLOW	4 CORE SCREEN 0.5mm
	ORANGE	6	GREEN	
	BLUE	7	BLUE	
	BLACK	8 61	RED	2 CORE SCREEN
GUARD FULLY OPEN SWITCH	BLUE	9 104	BLUE	

Z+	63	RED
LIMIT	64	BLUE

Z	BLUE	71 (WHITE)	ALTERNATIVE SENSOR
DATUM SENSOR	BLACK	74 (BLACK)	WIRING

Z -	64	RED	2 CORE SCREEN 0.2mm
LIMIT	65	BLUE	

82 BROWN	AIR PRESSURE SWITCH
60 BLUE	N/C WHEN NO AIR CONNECTED

COOLANT PUMP

BLUE	21
BLACK	22
BROWN	23
EARTH	E
1mm FLEX	

WORKLIGHT

BLACK	31
BLACK	33
EARTH	E
0.5mm SINGLES	

LUBE PUMP

BLACK	31
BLACK	36
EARTH	E
1mm FLEX	

LUBE FLOAT SWITCH

RED	81
BLUE	60
2 CORE SCREEN	

(415v SUPPLY) WIRE IN STAR
(220v SUPPLY) WIRE IN DELTA

SPINDLE MOTOR (WIRE IN DELTA)
1mm BLACK 4 CORE SCREEN

SPINDLE MOTOR FAN (SINGLE PHASE)
1mm 3 CORE FLEX

SPINDLE MOTOR THERMAL
2 CORE SCREEN

TU150 E LIMIT SWITCH AND MOTOR WIRING		SHEET 19
		TU150E
		OMRON

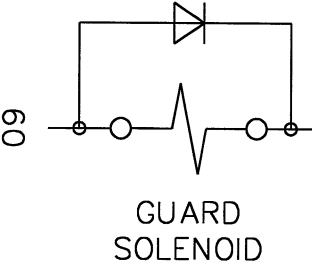
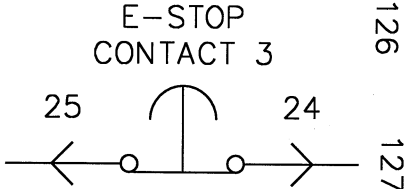
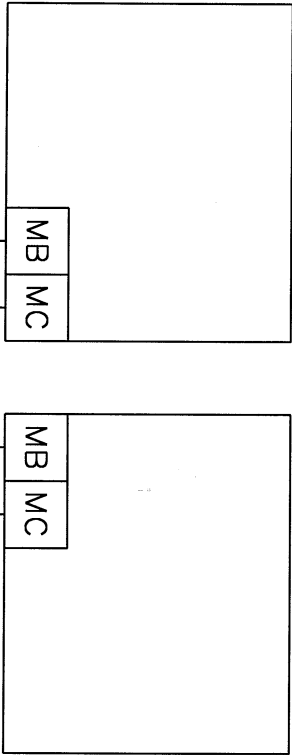
SPINDLE DRIVE
SEE SHEET 12
FOR DETAILS

TOOLPOST DRIVE
SEE SHEET 17
FOR DETAILS

IF IN DOUBT ASK

GUARD INTERLOCK
WITH SOLENOID

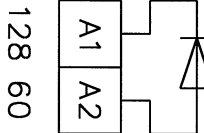
(REMOVE LINK 12 - 41)



GUARD
SWITCH
CONTACTS

78	BLACK	11	12	BROWN	79
214	RED	21	22	YELLOW	215
61	GREEN	33	34	BLUE	125

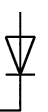

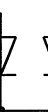
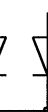



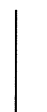
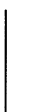

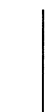
GUARD
SOLENOID



R B
E L
D U
E

QM3 24 WAY QM CONNECTOR
FOR TOE 80 TURRET

ALL WIRES 0.5mm BLUE
EXCEPT * 4 CORE SCREEN
+ 12 CORE SCREEN

MTA ALARM	25	102			
PARITY ALARM	26	102			
POSITION ALARM	27	102			
THERMAL ALARM	28	102		3	ADD I/O UNIT
TOOLCHANGE COMPLETE OUTPUT	29	236		A1	TCCR
TURRET THERMAL	30	229	* YELLOW		QM3 (14)
24v TO EXT EMERGENCY	31				
24v TO RESET P/B	32	***	RESET P/B		
24v TO TOOLPOST	33	224	+ VIOLET		QM3 (7)
24v OUTPUT	34				
0v TO TOOLPOST	35	225	+ GREY		QM3 (8)
0v	36				
GROUND	37	E			
FORCE CLOCKWISE	38				
FORCE COUNTER-CLOCKWISE	39				
TOOLPOST THERMAL	40	230	* GREEN		QM3 (15)
TOOLPOST STROBE COMMAND	41	235		14	TSSR
POS BCD 20 COMMAND	42				
POS BCD 10 COMMAND	43				
POS BIT 5 COMMAND	44				
POS BIT 4 COMMAND	45	234		14	TCB3
POS BIT 3 COMMAND	46	233		14	TCB2
POS BIT 2 COMMAND	47	232		14	TCB1
POS BIT 1 COMMAND	48	231		14	TCB0