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WIRING DIAGRAMS

for the

KODAK Miniloader 2000

and for the

KODAK Miniloader 2000 P

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1. BLOCK DIAGRAMS

BLOCK DIAGRAM CASSETTE INTERFACE

BLOCK DIAGRAM MAGAZINE INTERFACE

BLOCK DIAGRAM LOW VOLTAGE DISTRIBUTION

2. CIRCUIT DIAGRAMS

SWITCH SETTING OF S1-1 ON PCB A1. S1-2 is not used.

S1-1

Normally S1-1 should be set to OFF (down). In this case some errors can only be reset with the LAP TOP.

If S1-1 is set to ON (up) the following options are enabled:

Caution

This RESET cannot solve a real hardware problem or a film jam when it tries to recover from the problem. In such a case the problem will occur again in the next cycle. This means an exposed FILM would become lost. For this reason set S1-1 only to ON if the CUSTOMER is aware of this risk and if he is willing to accept it.

1. The OPERATOR can reset the Miniloader 2000 after every malfunction just by pressing the left-hand BUTTON. He can then try to start another cycle.

2. After selecting “FUNCTION” on the OPERATOR CONTROL PANEL the following selection is displayed:

TYPE2 USAGE LANG CLEAR

When S1-1 is ON (up) an altered selection is displayed:

TYPE2 SYSTEM USAGE LANG CLEAR

SYSTEM contains the following 4 options:

TIME This gives date and time.

Note

THE HISTO INFORMATION CAN ONLY BE ANALYSED IN THE FACTORY.

HISTO This gives information on the communication between the MAIN PROCESSOR PCB A1 and the SLAVE PROCESSORS PCB’s A3/1, A3/2 and the 270RA PROCESSOR.

3. An additional option is enabled in the ERROR MENU.

CLEAR [ ] **CODE RETURN**

In case of an error (this means the red error lamp is on), the second key from the left is enabled. If it becomes pressed the history of the last faulty cycle is given and the following line is displayed.

⇑ ⇓ **RETURN**

With the ARROW KEYS you can scroll through the history.

Note

THIS INFORMATION CAN ONLY BE ANALYSED BY THE FACTORY. When a history diskette is made, this information is automatically copied to the diskette, no matter if S1-1 is on or off.

FUSE RATING 250VAC SLOW BLOW	
UL / CSA	EUROPE
F1 1.6A	F1 1.6 A
F2 not installed	F2 not installed
F3 8.0A	F3 8.0 A
F4 6.25A	F4 6.3 A
F5 3.2A	F5 3.15 A
F6 4.0A	F6 4.0 A
F7 1.6A	F7 1.6 A
F8 3.2A	F8 3.15 A
F9 3.2A	F9 3.15 A
F10 3.2A	F10 3.15A
F11 3.2A	F11 3.15 A

TRANSFORMER WIRING

Wiring for 100V (50/60 Hz) Single Phase

Wiring for 115V (50/60 Hz) Single Phase

Wiring for 120V (50/60 Hz) Single Phase

Wiring for 200V (50/60 Hz) Single Phase

Wiring for 220V (50/60 Hz) Single Phase

Wiring for 230V (50/60 Hz) Single Phase

Wiring for 240V (50/60 Hz) Single Phase

PCB A1 MAIN PROCESSOR

R3 BACKLIGHT SWITCH OFF
R4 DISPLAY CONTRAST
R15 BUZZER VOLUME

TP1 = VCC +5V
TP2 = VμP +10V
TP3 = GND μP
TP4 = BACKLIGHT SUPPLY +4.7V
TP5 = Vee CONTRAST VOLTAGE -10V...-15V

FACTORY SETTING SWITCH S1
S1-1 ON (ON-Board Contrast Poti)*
S1-2 OFF (40 Char / Line)*
S1-3 OFF (Black Characters)*
S1-4 ON (Backlight always on)

S1-4 OFF Backlight ON if roomlight > 120 Lux
Backlight OFF if roomlight < 30 Lux

* Do not change the factory setting of S1-1, S1-2 and S1-3

PCB A2 OPERATOR INTERFACE Sheet 1 of 2

PCB A2 OPERATOR INTERFACE Sheet 2 of 2

	ML2000	ML2000 P
1.	B_C_FC_C	CHUTE CLOSED C_CC
2.	B_C_FC_O	not used
3.	Y_C_FC	Proc. Start

PCB A3/1 SLAVE PROCESSOR Cass. Unit

PCB A3/2 SLAVE PROCESSOR Mag. Unit

PCB A4 Mag. Interface
Sheet 1 of 9

PCB A4 Mag. Interface
Sheet 2 of 9

S2 = OFF DEDICATED RECEIVING MAGAZINE
S2 = ON NONE DEDICATED RECEIVING MAGAZINE

PCB A4 Mag. Interface
Sheet 3 of 9

PCB A4 Mag. Interface
Sheet 4 of 9

PCB A4 Mag. Interface
Sheet 5 of 9

SLAVE PROCESSOR CIRCUIT BOARD A3/2

CIRUIT BOARD A4

PCB A4 Mag. Interface
Sheet 6 of 9

CIRUIT BOARD A4

PCB A4 Mag. Interface
Sheet 7 of 9

TP1 VµP: Unreg. Microprocessor Voltage +10V
TP2 VCC: Microprocessor Voltage +5V
TP3 V PROG: Unreg. Progr. Voltage +15V
TP4 V PROG 2: Programming Voltage +12V
TP5 GND µP
TP6 VPE 10: Unreg. Peripheral Voltage +10V
TP7 VPE 12: Peripheral Voltage +5V
TP8 VPE 40: Unreg. Peripheral Voltage +30V
TP9 VPE 50: Unreg. Peripheral Voltage +30V
TP10 VPE 51: Peripheral Voltage +24V
TP11 GND PE

PCB A4 Mag. Interface
Sheet 8 of 9

PCB A4 Mag. Interface
Sheet 9 of 9
TP1 VμP: Unreg.Microprocessor Voltage +10V
TP2 VCC: Microprocessor Voltage +5V
TP3 V PROG: Unreg. Progr. Voltage +15V
TP4 V PROG 2: Programming Voltage +12V
TP5 GND μP
TP6 VPE 10: Unreg.Peripheral Voltage +10V
TP7 VPE 12: Peripheral Voltage +5V
TP8 VPE 40: Unreg.Peripheral Voltage +30V
TP9 VPE 50: Unreg.Peripheral Voltage +30V
TP10 VPE 51: Peripheral Voltage +24V
TP11 GND PE
To HUMIDIFIER
A4X31
A4X30
X2
Power Supply
UG2
UG3
L4960
VPE12
VPE12 TP7
VPE10 TP6
VPE 51
VPE 51 TP10
VPE 50
VPE 50 TP9
VPE 40
VPE 40 TP8
GND PE
TP11 GND PE
C107 100nF
C106 100nF
C105 100nF
C89 470μF
C88 470μF
C84 1000μF
C111 100nF
C85 2.2μF
C86 2.2nF
C87 33nF
R67 15k
R66 4.3k
L1
CR4
C114 100nF
C95 470μF
C94 470μF
C90 1000μF
C113 100nF
C91 2.2μF
C92 2.2nF
C93 33nF
R69 15k
R68 4.3k
R70 18k 1%
R71 4.7k 1%
L2
CR5
C115 100nF
C116 1000μF

PCB A5 FILMPOCKET
Sheet 1 of 2

PCB A5 FILMPOCKET
Sheet 2 of 2

TP1 VPE 12: Peripheral Voltage +5V
TP2 VPE 50: Unreg.Peripheral Voltage +30V
TP3 VPE 52: Peripheral Voltage +24V
TP4 GNDPE: Peripheral Ground

PCB A6 MAGAZINE CODE

PCB A7 LEVEL CONTROL

PCB A8 Mag. Interface
Sheet 1 of 10

PCB A8 Mag. Interface
ML2000 Sheet 2 of 10

PCB A8 Mag. Interface
ML2000P Sheet 3 of 10

PCB A8 Mag. Interface
Sheet 4 of 10

PCB A8 Mag. Interface
Sheet 5 of 10

PCB A8 Mag. Interface
Sheet 6 of 10

CIRUIT BOARD A8

PCB A8 Mag. Interface
Sheet 7 of 10

CIRUIT BOARD A8

PCB A8 Mag. Interface
Sheet 8 of 10

TP1 VµP: Unreg. Microproc. Voltage +10V
TP2 VCC: Microprocessor Voltage +5V
TP3 V PROG: Unreg. Prog. Voltage +15V
TP4 V PROG1: Programming Voltage +12V
TP5 GNDµP: GND Microprocessor
TP7 VPE11: Peripheral Voltage +5V
TP8 VPE30: Peripheral Voltage +30V
TP9 VPE31: Peripheral Voltage +24V
TP10 GND PE: Peripheral Ground

PCB A8 Mag. Interface
Sheet 9 of 10

TP1 VµP: Unreg. Microproc. Voltage +10V
TP2 VCC: Microprocessor Voltage +5V
TP3 V PROG: Unreg. Prog. Voltage +15V
TP4 V PROG 1: Programming Voltage +12V
TP5 GNDµP: GND Microprocessor
TP7 VPE11: Peripheral Voltage +5V
TP8 VPE30: Peripheral Voltage +30V
TP9 VPE31: Peripheral Voltage +24V
TP10 GND PE: Peripheral Ground

PCB A8 Mag. Interface
Sheet 10 of 10

PCB A9 DC MOTOR DRIVE
Sheet 1 of 2

TP1 VPE11: Peripheral Voltage +5V
TP2 VPE20: Unreg.Peripheral Voltage +30V
TP3 VPE21: Peripheral Voltage +20V
TP4 GND PE: Peripheral Ground

PCB A9 DC MOTOR DRIVE
Sheet 2 of 2

PCB A10/1 A10/2 ODOMETER

DATA CABLE RS232

3. CIRCUIT BOARD LAYOUTS

PCB A0 POWER SUPPLY

PCB A1 MAIN PROCESSOR

R3 BACKLIGHT SWITCH OFF
R4 DISPLAY CONTRAST
R15 BUZZER VOLUME

TP1 = VCC +5V
TP2 = VµP +10V
TP3 = GND µP
TP4 = BACKLIGHT SUPPLY +4.7V
TP5 = Vee CONTRAST VOLTAGE -10V...-15V

FACTORY SETTING SWITCH S1
S1-1 ON (ON-Board Contrast Poti)*
S1-2 OFF (40 Char / Line)*
S1-3 OFF (Black Characters)*
S1-4 ON (Backlight always on)

S1-4 OFF Backlight ON if roomlight > 120 Lux
Backlight OFF if roomlight < 30 Lux

* Do not change the factory setting of S1-1, S1-2 and S1-3

PCB A2 OPERATOR INTERFACEE

PCB A3 SLAVE PROCESSOR

PCB A4 MAGAZINE

PCB A5 FILMPOCKET

PCB A6 MAGAZINE SENSE

PCB A7 LEVEL CONTROL

PCB A8 CASSETTE INTERFACE

PCB A9 DC MOTOR DRIVER

PCB A10 ODOMETER

4. PNEUMATIC

FILM POCKET
SUCKER BAR
FILM POCKET
BLOW PIPES
CASSETTE
SUCKER BAR
Strainer
and
Water
Trap
A8X38
2
1
-0.4 bar
FILM CHUTE
CYLINDER
Y6/C_PU_VE
Y5/C_PU_S
A8X37
Y3/C_FC
A4X18
-0.4 bar
Y12/M_PU_S
Bleeder
Valve
4 bar
A4X20
Y10/ M_PU_BS
Y11/ M_PU_B
M
M16/M_CP
COMPRESSOR
COOLING
COIL
Strainer and
Water Trap
A4X19
A4X23

PNEUMATICS

PNEUMATIC VALVE ASSEMBLY

5. SIGNAL LIST

INPUT SIGNALS CASSETTE INTERFACE A3/1

FUNCTION CENTERING

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_CE_C}}$	**B11/C_CE_CL CASSETTE CENTERED LEFT**	The CASSETTE is centred when this signal is LOW. SENSORS “CASSETTE CENTERED LEFT” and “CASSETTE CENTERED RIGHT” are connected in line.
$\overline{\text{B_C_CE_C}}$	**B12/C_CE_CL CASSETTE CENTERED RIGHT**	The CASSETTE is centred when this signal is LOW. SENSORS “CASSETTE CENTERED LEFT” and “CASETTE CENTERED RIGHT” are connected in line.
$\overline{\text{B_C_CE_EO}}$	**B10/C_CE_EO CENTERING BARS OPENED**	This signal is LOW when the CENTERING BARS are in their outermost position.
$\overline{\text{B_C_CE_L0}}$	**B13/C_CE_L CASSETTE LENGTH DETECTION**	The CENTERING BARS move in until they are stopped by the CASSETTE (SENSORS “CASSETTE CENTERED LEFT" and “CASSETTE CENTERED RIGHT” are actuated). The amount of pulses (generated by the ODOMETER PCB A10/2) on the signal is used to calculate the CASSETTE LENGTH.
$\overline{\text{B_C_CE_L1}}$	**B13/C_CE_L CASSETTE LENGTH DETECTION**	The signal is LOW when the CENTERING BARS are moving out. The signal is HIGH when the CENTERING BARS are moving in.

FUNCTION FRONT DOOR

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_FD}}$	**B1/C_FD FRONT DOOR SWITCH**	The signal is LOW as long as the FRONT DOOR is closed.

FUNCTION INPUT FLAP

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_IF_EC}}$	**B4/C_IN_EC CASSETTE INPUT FLAP CLOSED**	The signal is LOW when the CASSETTE INPUT FLAP is closed.
$\overline{\text{B_C_IF_EO}}$	**B3/C_IN_EO CASSETTE INPUT FLAP OPEN**	The signal is LOW when the CASSETTE INPUT FLAP is open.

FUNCTION CASSETTE INPUT

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_IN_EM}}$	**B6/C_IN_EM CASSETTE IN ENDSWITCH MIDDLE**	If the ENDSWITCH is actuated by a CASSETTE, the signal goes LOW. CENTERING is started.
$\overline{\text{B_C_IN_R}}$	**B2/C_IN_R CASSETTE REGISTRATION**	The signal goes LOW when the CASSETTE actuates the SENSOR. When a CASSETTE is pushed in by the Operator, the cycle is started.

FUNCTION OPEN CASSETTE

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_OP_P0}}$	**B14/C_OP_P CASSETTE OPENER POSITION**	The ODOMETER PCB A12 generates pulses as long as the OPENER BRACKET moves up or down. The pulses are used to detect the LOWER-, the BLOW- and the HOME-POSITION of the OPENER BRACKET.
$\overline{\text{B_C_OP_P1}}$	**B14/C_OP_P CASSETTE OPENER POSITION**	The signal is LOW when the OPENER BRACKET moves up. The signal is HIGH when the OPENER BRACKET moves down.
$\overline{\text{B_C_OP_EO}}$	**B15/C_OP_EO CASSETTE OPENER END SWICH OPEN**	This signal is LOW when the CASSETTE OPENER is in the HOME POSITION.
$\overline{\text{B_C_OP_RO}}$	**B16/C_OP_RO CASSETTE REALLY OPEN**	The signal is LOW when the CASSETTE is really open.

FUNCTION FILM PICKUP FROM CASSETTE

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_PU_EF}}$	**B17/C_PU_EF CASSETTE FILM PICK UP FRONT**	The signal is LOW when the CASSETTE SUCKER BAR ARRIAGE is in the FRONT POSITION.
$\overline{\text{B_C_PU_ER}}$	**B18/C_PU_ER CASSETTE FILM PICK UP REAR**	The signal is HIGH when the CASSETTE SUCKER BAR CARRIAGE is in the REAR POSITION.
$\overline{\text{B_C_PU_T}}$	**B19/C_PU_T SUCKER BAR TILT**	The signal is LOW when the CASSETTE SUCKER BAR is tilted. The signal is used as an indicator if the FILM in the CASSETTE is picked up or not by the CASSETTESUCKER BAR.

$\overline{\text{B_C_PU_VO}}$	**B20/C_PU_VO** ***VAC*UUM OFF**	The FILM is picked up from the CASSETTE and transported into the CONVEYOR. As soon as it enters the CONVEYOR the SENSOR “VACUUM OFF” is actuated and the signal goes LOW. A short time later the vacuum is turned off to release the FILM from the SUCKERS.

FUNCTION RESET

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_RESET}}$	**PCB A8 S1** **RESET**	When S1 is pressed the signal goes LOW. This resets the SLAVE PROCESSOR PCB A3/1.

FUNCTION INTERLOCK

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_TC_I}}$	**B23/C_TCI** **TOP COVER** **INTERLOCK**	The signal is LOW as long as the TOP COVER is closed

FUCTION RECEIVING MAGAZINE

SIGNAL NAME	SENSOR	PURPOSE
B_C_RM_E	**B24/C_RM_E** **Receiving Magazine** **Entrance**	This signal goes LOW if no FILM is in the MAGAZINE ENTRANCE.
B_C_RM_F	B25/C_RM_F Receiving Magazine Full	This signal goes HIGH if the RECEIVING MAGAZINE is full.

FUNCTION FILM CHUTE (ML2000 only)

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_C_FC_O}}$	**B7/C_FC_O**	This signal is LOW if the FILM CHUTE GUIDES are in the 18x24 position.
$\overline{\text{B_C_FC_C}}$	**B5/C_FC_C**	This signal is LOW if the FILM CHUTE GUIDES are in the 24x30 position.

OUTPUT SIGNALS CASSETTE INTERFACE A3/1

FUNCTION CONTROL SIGNAL

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{G_C_SP_S}}$	**PCB A8 DS1**	This signal turns the red LED on PCB A8 on or off. **LED (red) is off** This may occur after power up only if a RAM-test failureis detected or the bootstrap-software is faulty. **LED (red) is blinking continuously** In this case only the bootstrap software is running. This happens during software load from the Lap Top. **LED (red) displays a rhythmic blinking** In this case a fatal error occurred. A “normal” error code will be displayed too. If the problem cannot be solved try to record the blinking hex error code and pass it on to your local specialist. The problem can then be analysed in the factory. For example the LED blinks as follows: The asterisks means the LED is on. * 0.5 sec pause * * * * * * * 1 sec pause * 0.5 sec pause * * * * * * * and so on. The 2 digit hex code for this example is 17

FUNCTION CASSETTE CENTERING

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_C_CE_C}}$	**M4/C_CE CASSETTE CENTERING**	When this signal goes LOW the CASSETTE CENTERING becomes closed.
$\overline{\text{M_C_CE_O}}$	**M4/C_CE CASSETTE CENTERING**	When this signal goes LOW the CASSETTE CENTERING becomes opened.

FUNCTION INPUT FLAP

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_C_IF}}$	**M1/C_IF CASS. INPUT FLAP**	A LOW turns on the MOTOR CASSETTE INPUT FLAP. To avoid FILM FOGGING this FLAP has to be closed when a CASSETTE is in the ML2000 / ML2000 P. The MOTOR turns only in one direction and is stopped by the SENSOR “CASSETTE INPUT FLAP OPEN” or “CASSETTE INPUT FLAP CLOSED".

FUNCTION CASSETTE INPUT

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_C_IN_F}}$	**M2/C_IN CASSETTE INPUT**	The MOTOR CASSETTE INPUT is turned on in forward by a LOW. The CASSETTE is transported until the CASSETTE IN END SWITCH is actuated.
$\overline{\text{M_C_IN_R}}$	**M2/C_IN CASSETTE INPUT**	The MOTOR CASSETTE INPUT is turned on in reverse by a LOW.

FUNCTION OPEN CASSETTE

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_C _OP_F}}$	**M5/C_OP CASSETTE OPENING**	A LOW turns on the MOTOR CASSETTE OPENING and moves the OPENER BRACKET fully up. The MOTOR is turned off, after SENSOR “CASSETTE OPENER OPEN” is reached.
$\overline{\text{M_C_OP_R}}$	**M5/C_OP CASSETTE OPENING**	A LOW turns on the MOTOR CASSETTE OPENING and moves the OPENER BRACKET fully down. The MOTOR is turned off after the correct amount of pulses is generated by the ODOMETER PCB A12. There is no END SWITCH for the LOWER OPENER BRACKET POSITION.
$\overline{\text{Y_C_OP}}$	**Y4/C_OP CASSETTE OPENER**	A LOW energises the OPENER SOLENOID. The **SOLENOID is energised with maximum current and a short time later the current is reduced. This current control is done by IC U41.**

FUNCTION FILM PICKUP FROM CASSETTE

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_C_PU_F}}$	**M6/C_PU CASS. FILM PICK UP**	The FILM PICK UP MOTOR is turned on in forward by a LOW. The MOTOR is turned off when the SENSOR “CASSETTE FILM PICK UP FRONT” is reached.
M_C_PU_R	**M6/C_PU CASS. FILM PICK UP**	The FILM PICK UP MOTOR is turned on in reverse by a LOW. The MOTOR is turned off when the SENSOR “CASSETTE FILM PICK UP REAR” is reached.
$\overline{\text{M_C_PU_RO}}$	**M7/C_PU_RO ROLLER MOTOR**	The ROLLER MOTOR is in the CONVEYOR and transports the FILM to the FILM CHUTE. It is turned on by a LOW.

FUNCTION FRONT DOOR

SIGNAL NAME	DESTINATION	PURPOSE
Y_C_FD	**Y1/C_FD_L FRONT DOOR SOLENOID**	A LOW energises the FRONT DOOR SOLENOID and the FRONT DOOR can be opened.

FILM PICKUP FROM CASSETTE

SIGNAL NAME	DESTINATION	PURPOSE
Y_C_PU	**Y7/C_PU TILTING SUCKER BAR**	A LOW energises the TILT IN SUCKER BAR SOLENOID (WHITNEY MECHANISM). The SOLENOID is energised with maximum current and a short time later the current is reduced. This current control is done by IC U40.
Y_C_PU_S	**Y5/C_PU_S1 Y6/C_PU_S2 CASSETTE SUCKING**	A LOW energises the CASSETTE SUCKING SOLENOID VALVE. The VACUUM is now built up in the SUCKERS and the FILM is picked up from the BOTTOM SCREEN of the CASSETTE.

FILM CHUTE (ML2000 only)

SIGNAL NAME	DESTINATION	PURPOSE
Y_C_FC	**Y3/C_FC FILM CHUTE**	A LOW energises the FILM CHUTE SOLENOID VALVE Y3. The FILM CHUTE will go into the closed position at the beginning of a cycle. If the signal is HIGH the FILM CHUTE will go to the open position.

PROCESSOR (ML2000 P only)

SIGNAL NAME		PURPOSE
Proc. Interface		This signal is provided by the M35-M Processor Interface. It enables the ML2000 P to unload a CASSETTE.
Proc. Start		This signal is provided by the ML2000 P and starts the M35-M Processor.

ADDITIONAL ML2000P FUNCTIONS

Note

- SENSOR B26 is not retrofitable. It is factory installed only.
- The PROCESSOR READY KIT is an accessory. It is not factory installed.
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SIGNAL NAME		PURPOSE
$\overline{\text{C_CC}}$	**B26/C_CC CHUTE CLOSED**	This signal is provided if the ML2000P is rolled fully over the M35-M Processor.
C_PRON	From PROCESSOR READY KIT	This signal is provided if the M35-M Processoris switched ON.
C_PRDH	From PROCESSOR READY KIT	This signal is provided if the M35-M Processor has reached the set temperature.

INPUT SIGNALS MAGAZINE INTERFACE A3/2

FUNCTION MAGAZINE OPENING

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_M_OP_EC}}$	**B37/M_OP_EC END SWITCH**	The MAGAZINE OPENER is in the bottom position when this signal is LOW.
$\overline{\text{B_M_OP_EO}}$	**B36/M_OP_EO MAGAZINE OPENING SWITCH**	The MAGAZINE OPENER is in the upper position when this signal is LOW. This means all three MAGAZINES are open.

FUNCTION FILMPOCKET POSITION

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_M_PO_HP}}$	**B30/M_PO_HP HOME POSITION.**	This signal is LOW when the FILMPOCKET is in the HOME POSITION. This position is close to MAGAZINE LEVEL 2. The FILMPOCKET is always parked here when in standby.
$\overline{\text{B_M_PO_ML}}$	**B32/M_PO_ML MAGAZINE LEVEL**	This signal is LOW when the FILMPOCKET is at MAGAZINE LEVEL 1 or 2 or at CASSETTE LEVEL.
$\overline{\text{B_M_PO_DS}}$	**B59/M_PU_DS DOUBLE SHEET DETECTOR**	This signal goes LOW when there is more than 1 FILM between the DETECTOR ROLLERS.

FUNCTION FILM PICKUP FROM MAGAZINE

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_M_PU_E}}$	**B60/M_PU_E MAGAZINE EMPTY**	This signal goes LOW when the selected MAGAZINE is found empty.
$\overline{\text{B_M_PU_EF}}$	**B56/M_PU_EF MAGAZINE FILM PICK UP END SWITCH FRONT**	This signal goes LOW when the FILMPOCKET SUCKER BAR ARM is rotated to the fully upright position.
$\overline{\text{B_M_PU_ER}}$	**B58/M_PU_ER MAGAZINE FILM PICK SWITCH REAR**	This signal goes LOW when the FILMPOCKET SUCKER BAR ARM is rotated fully out of the MAGAZINE and fully down.
$\overline{\text{B_M_PU_FS}}$	**B61/M_PU_FS FILM AT SUCKER BAR**	This signal goes LOW when the MAGAZINE SUCKER BAR reaches the top FILM in the MAGAZINE. It stays LOW as long as a FILM is at the SUCKERS.
$\overline{\text{B_M_PU_M}}$	**B57/M_PU_M MAGAZINE FILM PICK UP MIDDLE POSITION**	This signal goes LOW when the MAGAZINE SUCKER BAR is rotated out of the MAGAZINE and reaches an approximately horizontal position.

FUNCTION MAGAZINE SIZE DETECTION

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_M_SD_B1}}$ **$\overline{\text{B_M_SD_B2}}$** **$\overline{\text{B_M_SD_B3}}$** **$\overline{\text{B_M_SD_B4}}$**	See SENSORS on PCB A6/1 A6/2	These signals are used to decode the MAGAZINE SIZE.
B_M_SD_CD	See SENSORS on PCB A6/1 A6/2	This signal is used to detect if the selected MAGAZINE is closed.

FUNCTION RECEIVING MAGAZINE

SIGNAL NAME	SENSOR	PURPOSE
$\overline{\text{B_M_RM_P}}$	**B33/M_RM_P RECEIVING MAGAZINE PRESENT**	This signal is LOW when the RECEIVING MAGAZINE is inserted correctly.
B_M_RM_C	B34/_M_RM_C RECEIVING MAGAZINE CODE	LOW = 24x30 cm HIGH = 18x24 cm

OUTPUT SIGNAL MAGAZINE INTERFACE A3/2

FUNCTION FILM PICKUP FROM MAGAZINE

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{G_M_PU_E}}$	**B60/M_PU_E MAGAZINE EMPTY SENSOR**	This signal is used to turn on and off the MAGAZINE EMPTY SENSOR. The SENSOR is pulsed to avoid FILM FOGGING. This signal turns the red LED on PCB A8 on or off.

FUNCTION MAGAZINE SIZE DETECTION

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{G_M_SD_L1}}$ $\overline{\text{G_M_SD_L2}}$	**PCB A6/1**	These signals are the SELECT LINES for the two MAGAZINE SENSE BOARDS. They are not LOW at the same time.

FUNCTION CONTROL SIGNAL

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{G_M_SP_S}}$	**DS1 on PCB A4**	This signal turns the red LED on PCB A4 on or off. **LED (red) is off** This may occur after power up only if a RAM-test failure is detected or the bootstrap-software is faulty. **LED (red) is blinking continuously** In this case only the bootstrap software is running. This happens during software load from the Lap Top. **LED (red) displays a rhythmic blinking** In this case a fatal error occurred. A “normal” error code will be displayed too. If the problem cannot be solved try to record the blinking hex error code and pass it on to your local specialist. The problem can then be analysed in the factory. For example the LED blinks as follows: The asterisks means the LED is on. * 0.5 sec pause * * * * * * * 1 sec pause * 0.5 sec pause * * * * * * * and so on. The 2 digit hex code for this example is 17

FUNCTION COMPRESSOR

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_M_CP}}$	**M16/M_CP COMPRESSOR**	If this signal goes LOW the COMPRESSOR is turned on. The COMPRESSOR is used to generate pressure and vacuum.

FUNCTION MAGAZINE OPENING

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_M_OP_C}}$	**M14/M_OP MAGAZINE OPENER**	If this signal goes LOW the MAGAZINE OPENER MOTOR is turned on to close all three MAGAZINES.
$\overline{\text{M_M_OP_O}}$	**M14/M_OP MAGAZINE OPENER**	If this signal goes LOW the MAGAZINE OPENER MOTOR is turned on to open all three MAGAZINES.

FUNCTION FILM PICKUP FROM MAGAZINE

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_M_PU_F}}$	**M15/M_PU PICKUP MAGAZINE**	When this signal is LOW MOTOR M15 is turned on forward and the MAGAZINE SUCKER BAR is rotated into the MAGAZINE.
$\overline{\text{M_M_PU_R}}$	**M15/M_PU FILM PICKUP MAGAZINE**	When this signal is LOW MOTOR M15 is turned on in reverse and the MAGAZINE SUCKER BAR is rotated out of the MAGAZINE.
$\overline{\text{Y_M_PU}}$	**PCB A5 U5**	When this signal is LOW the SOLENOID Y14/PU MAGAZINE SUCKER BAR TILTING is energised.
$\overline{\text{Y_M_PU_B}}$	**Y11/M_PU_B MAGAZINE BLOWING**	When this signal is LOW, SOLENOID VALVE Y11 is energised and air is blown into the MAGAZINE to separate the FILMS.
$\overline{\text{Y_M_PU_BS}}$	**Y10/M_PU_BS MAGAZINE BLOW INTO SUCKERS**	When this SIGNAL is LOW SOLENOID VALVE Y10 is energised and air is blown into the SUCKERS of the MAGAZINE SUCKER BAR, to separate the FILM from the SUCKERS, when the FILM is put into the CASSETTE.
$\overline{\text{Y_M_PU_DS}}$	**Y15/M_PU_DS DOUBLE SHEET DETECTOR**	When this signal is LOW SOLENOID Y15 is energised and the spring loaded DOUBLE SHEET DETECTOR ASSY moves forward to the MAGAZINE.
$\overline{\text{Y_M_PU_S}}$	**Y12/M_PU_S MAGAZINE SUCKING**	When this signal is LOW SOLENOID VALVE Y12 is energised. Vacuum can now be built up in the MAGAZINE SUCKERS to pick up a fresh FILM.

FUNCTION FILM TRANSPORT INTO RECEIVING MAGAZINE

SIGNAL NAME	DESTINATION	PURPOSE
$\overline{\text{M_M_E}}$	**M13/M_I STEPPER MOTOR INTERFACE**	A LOW is the ENABLE SIGNAL for the STEPPER MOTOR CONTROL on PCB A4 sheet 4.
$\overline{\text{M_M_I_RE}}$	**M13/M_I STEPPER MOTOR INTERFACE**	A LOW is the RESET SIGNAL for the STEPPER MOTOR CONTROL on PCB A4 sheet 4.
$\overline{\text{M_M_I_ST}}$	**M13/M_I STEPPER MOTOR INTERFACE**	This is the SEP SIGNAL for MOTOR M13. The signal is amplified by the STEPPER MOTOR CONTROL on PCB A4 sheet 4 and converted into the 4 PHASE SIGNALS required by the STEPPER MOTOR.

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