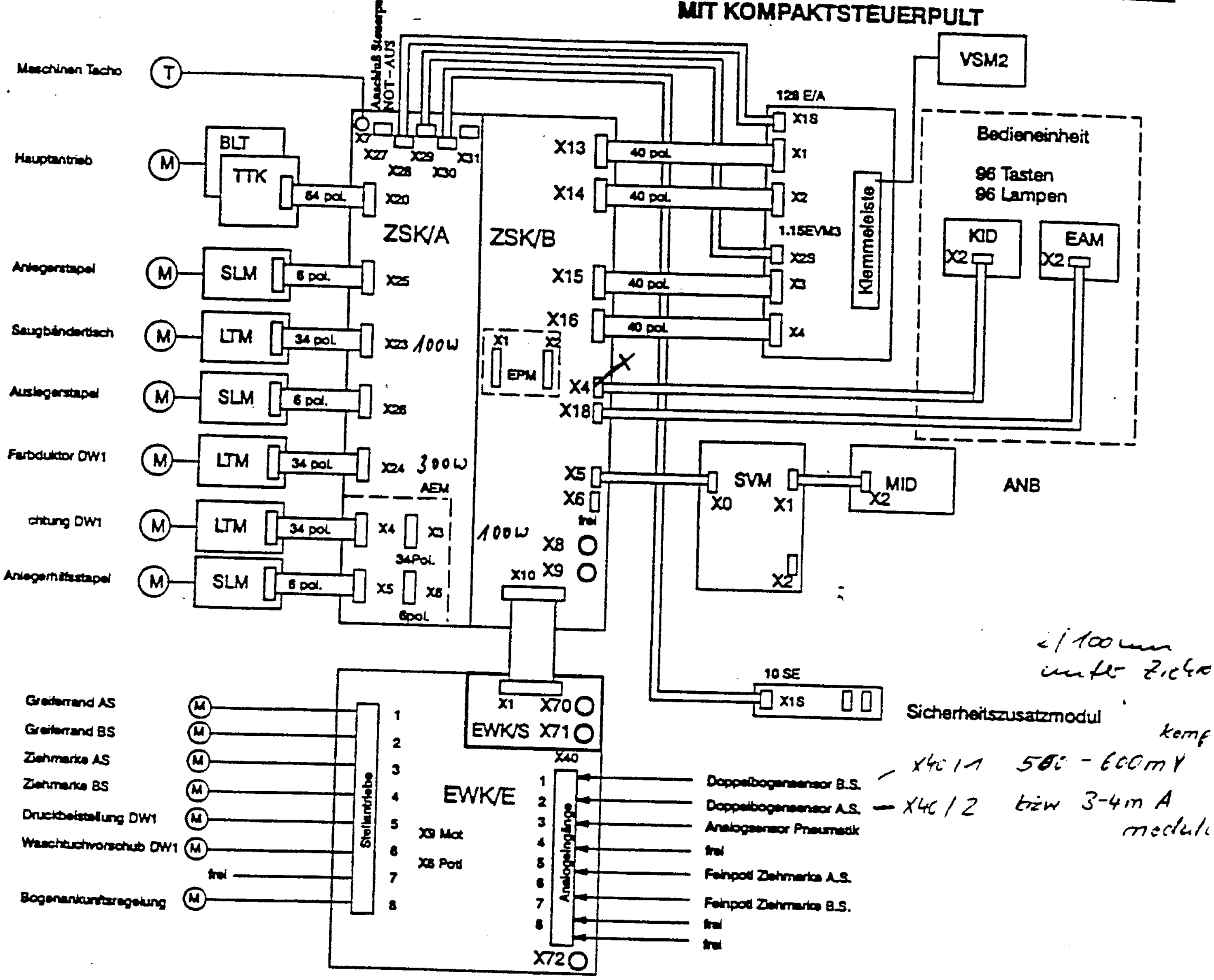
SM52

HEIDELBERG

Forschung und Entwicklung

Kompaktelektronik für G1

MIT KOMPAKTSTEUERPULT



KID Schnittstelle auf EWK1 X34 bis Serienstart

in Plänen jedoch X4

550mV ≙ ca. 1000 Imp.

SM52

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Kompaktelektronik für G2

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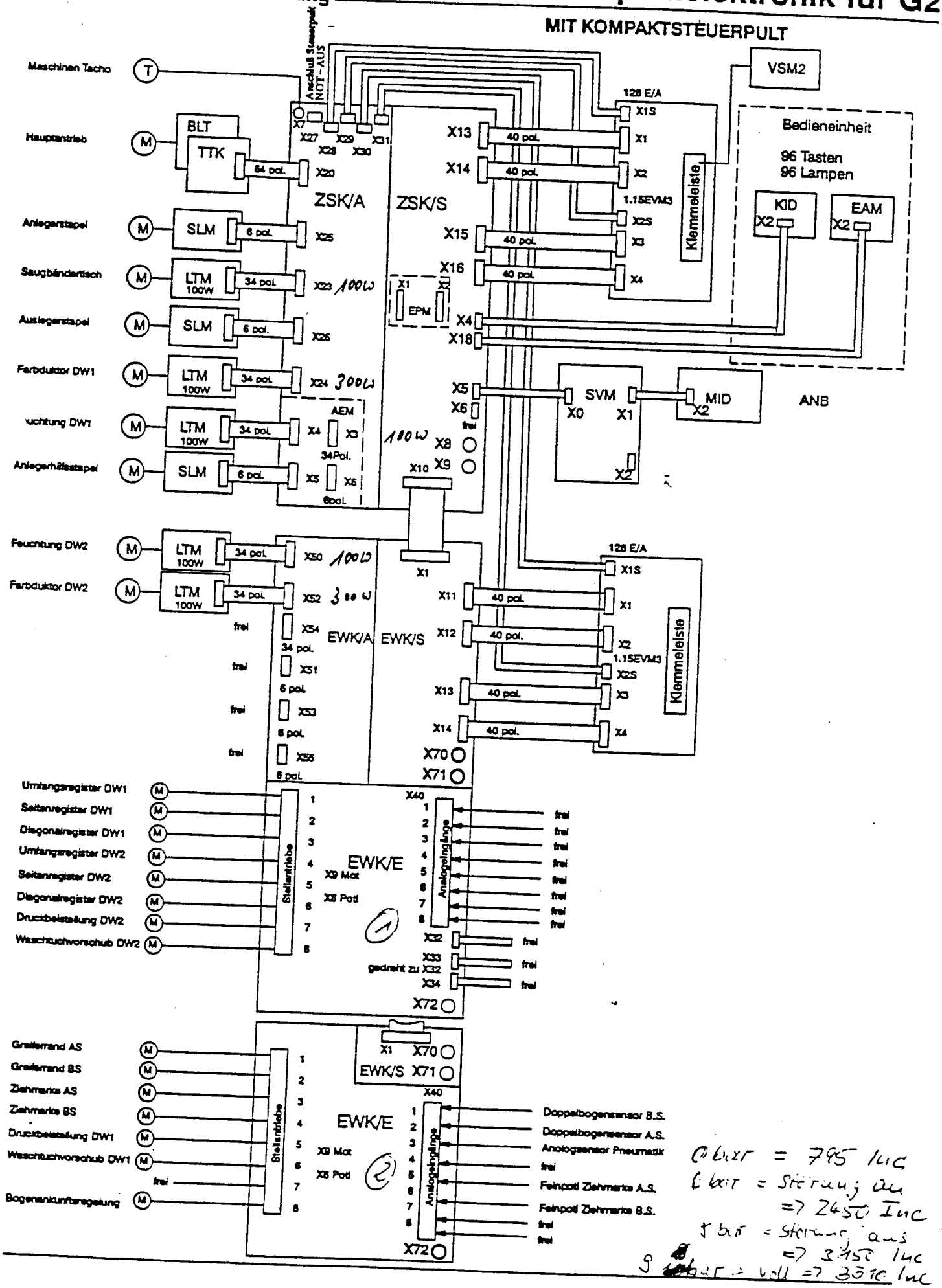

0 bar = 795 Inc

1 bar = Störung an
=> 2450 Inc

2 bar = Störung aus
=> 3450 Inc

3 bar = voll => 3350 Inc

05.05.94 E11.3 Getto

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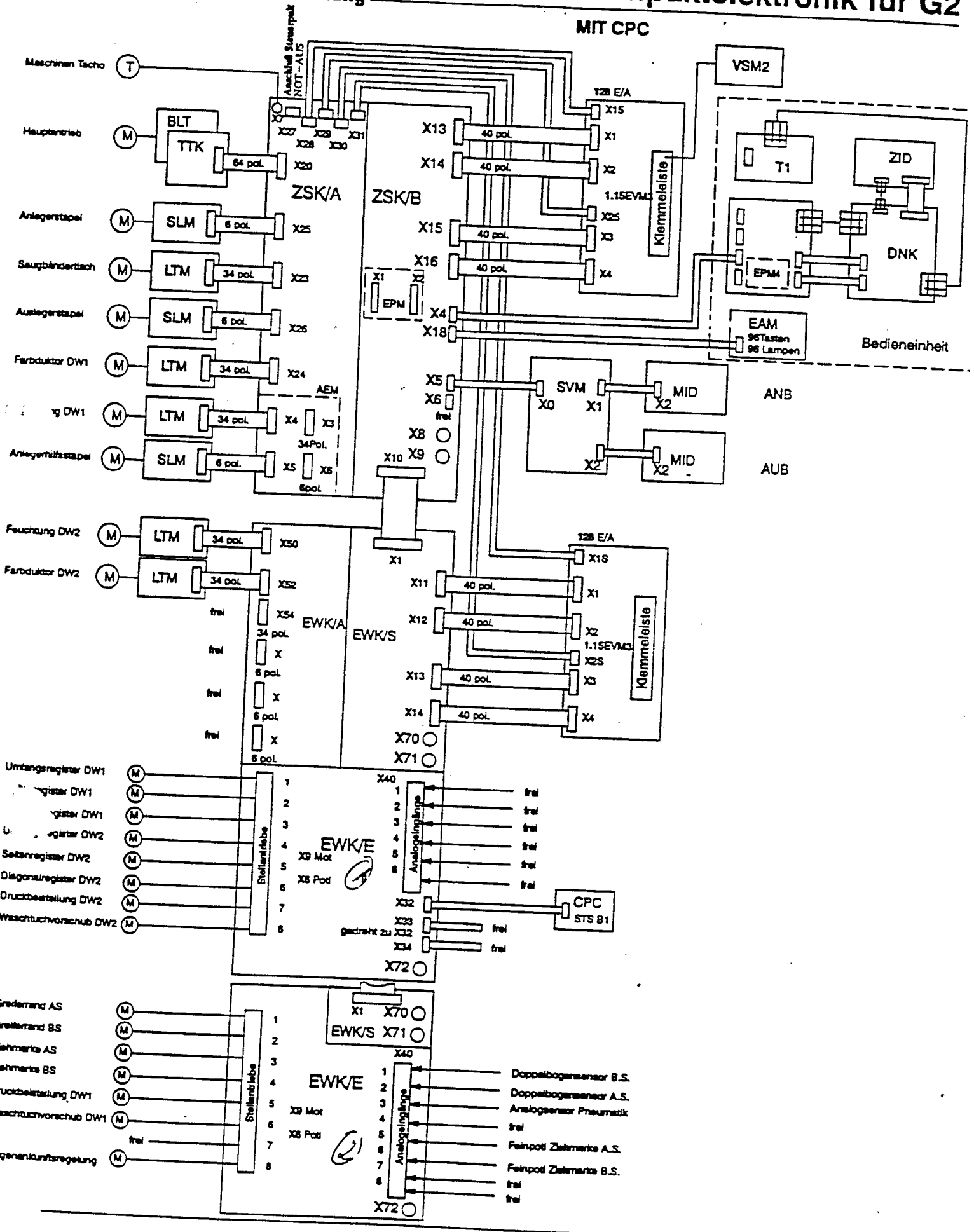
Kompaktelektronik für G2

MIT CPC

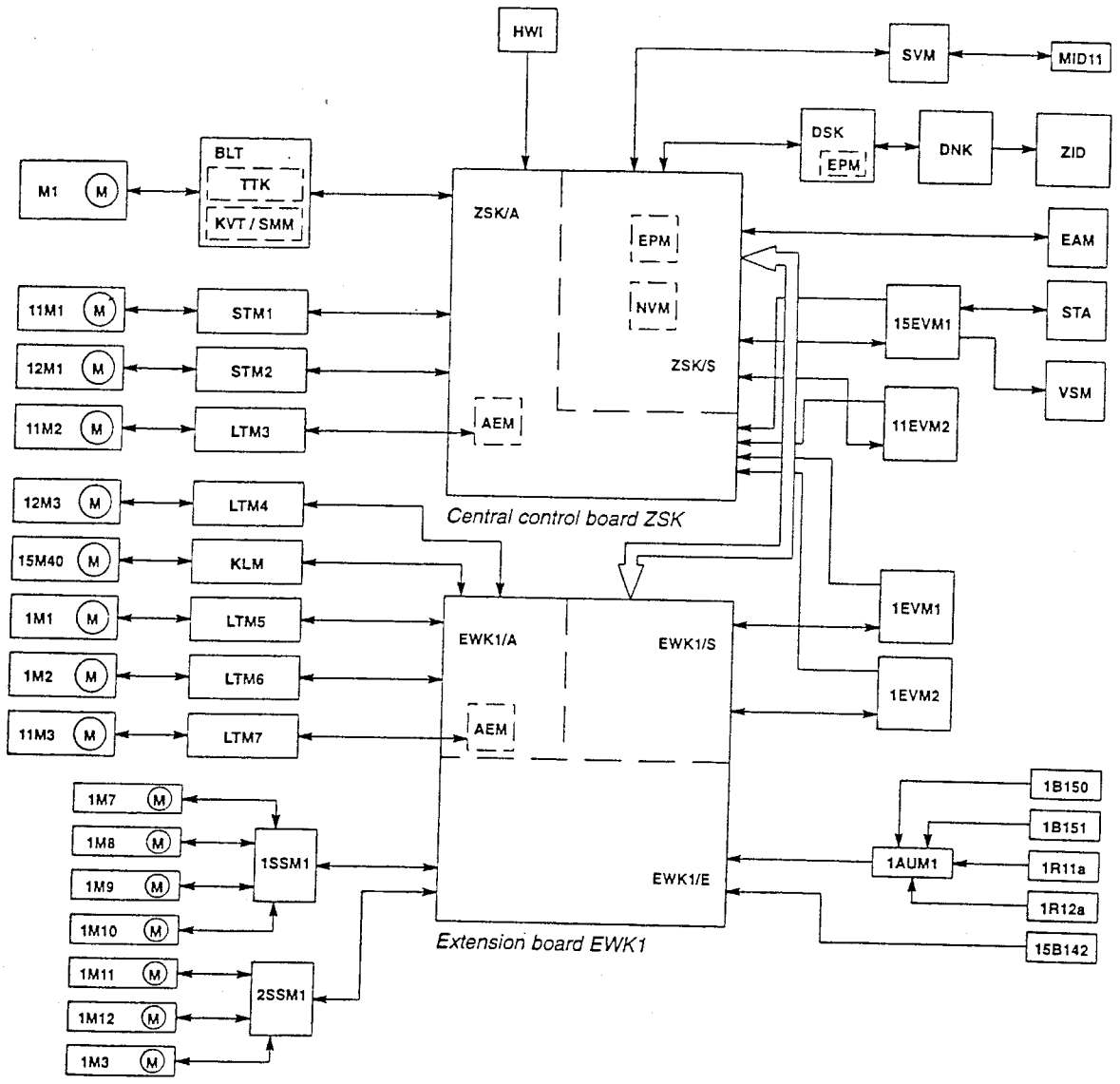


05.05.94 E11.3 Getto

Control system

Block diagram

Block diagram SM74-1



Block diagram for SM74-1

Explanation of the block diagram for SM74-1

"Brushless" main drive:

M1 – Main motor

Auxiliary drives:

11M1 – Main pile motor at feeder
12M1 – Main pile motor at delivery
11M2 – Auxiliary pile motor at feeder
12M3 – Sheet slowdown motor at delivery
15M40 – Blower for sheet slowdown / front edge blower
1M1 – Water pan roller motor at printing unit 1
1M2 – Ink fountain roller at printing unit 1
11M3 – Suction unit at feeder

Servo-drives

1M7 – Automatic sheet arrival control
1M8 – Cover guide height adjustment
1M9 – Print-free margin D.S.
1M10 – Print-free margin O.S.
1M11 – Adjustment of pull lay D.S.
1M12 – Adjustment of pull lay O.S.
1M3 – Adjustment of printing pressure on printing unit 1

Central control board ZSK:

ZSK/A – Drive section of central control board
ZSK/S – Control section of central control board

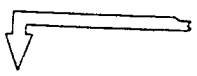
Extension boards EWK 1 and EWK2:

EWK/A – Drive section of extension board
EWK/S – Control section of extension board
EWK/E – Servo-drive section of extension board

Analog inputs

15B142 – Pressure sensor / pneumatic system
1B150 – Sensor / double-sheet detector O.S.
1B151 – Sensor / double-sheet detector D.S.
1R11a – Potentiometer / precision adjustment of pull lay D.S.
1R12a – Potentiometer / precision adjustment of pull lay O.S.

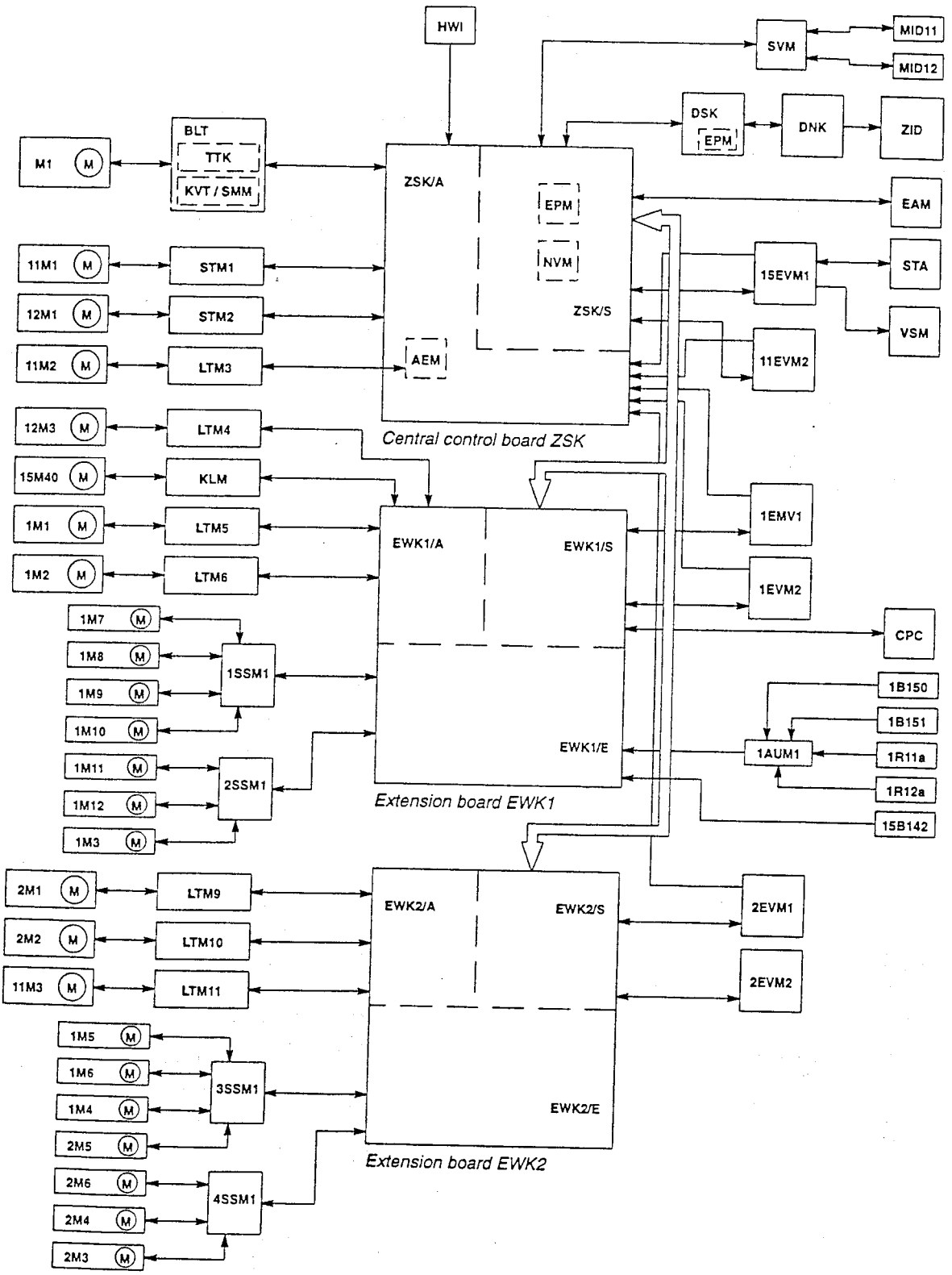
Connections:



Data bus

Directions of signal flow

Block diagram SM74-2



Block diagram for SM74-2

Explanation of the block diagram for SM74-2

"Brushless" main drive:

M1 – Main motor

Auxiliary drives:

11M1 – Main pile motor at feeder
12M1 – Main pile motor at delivery
11M2 – Auxiliary pile motor at feeder
12M3 – Sheet slowdown motor at delivery
15M40 – Blower for sheet slowdown / front edge blower
1M1 – Water pan roller motor at printing unit 1
1M2 – Ink fountain roller at printing unit 1
2M1 – Water pan roller motor at printing unit 2
2M2 – Ink fountain roller at printing unit 2
11M3 – Suction unit at feeder

Servo-drives

1M7 – Automatic sheet arrival control
1M8 – Cover guide height adjustment
1M9 – Print-free margin D.S.
1M10 – Print-free margin O.S.
1M11 – Adjustment of pull lay D.S.
1M12 – Adjustment of pull lay O.S.
1M3 – Adjustment of printing pressure on printing unit 1
1M5 – Circumferential register on printing unit 1 [1]
1M6 – Lateral register on printing unit 1 [1]
1M4 – Diagonal register on printing unit 1
2M5 – Circumferential register on printing unit 2 [1]
2M6 – Lateral register on printing unit 2 [1]
2M4 – Diagonal register on printing unit 2
2M3 – Adjustment of printing pressure on printing unit 2

Central control board ZSK:

ZSK/A – Drive section of central control board
ZSK/S – Control section of central control board

Extension boards EWK 1 and EWK2:

EWK/A – Drive section of extension board
EWK/S – Control section of extension board
EWK/E – Servo-drive section of extension board

Analog inputs

15B142 – Pressure sensor / pneumatic system
1B150 – Sensor / double-sheet detector O.S.
1B151 – Sensor / double-sheet detector D.S.
1R11a – Potentiometer / precision adjustment of pull lay D.S.
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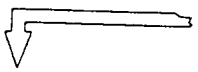
Connections:


Data bus

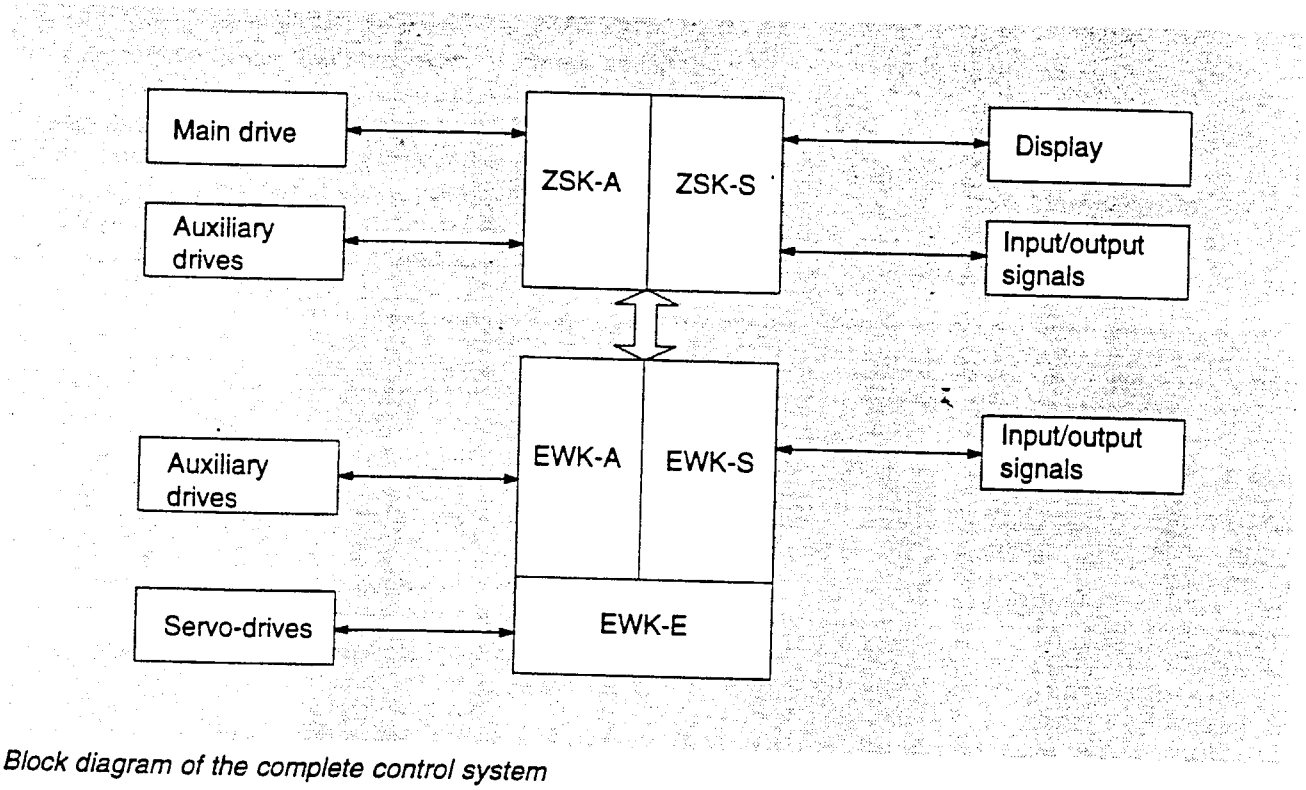
Directions of signal flow

[1] In the case of Speedmaster 74-2 with CPC1 these servo-drives are connected to CPC1

Control overview

Basic control concept

Block diagram



Block diagram of the complete control system

The central part of the press control system "CPTronic compact" consists of the central control board ZSK and the extension board EWK [1]. All control functions are implemented on these electronic boards. The ZSK is divided into the following function areas:

- the control section ZSK-S
- the drive section ZSK-A.

The EWK is responsible for additional functions which are divided into three areas:

- the control section EWK-S
- the drive section EWK-A
- the servo-drive section EWK-E.

This central part thus forms the core of the "CPTronic compact", where all trigger signals for drives and displays come from and where all signals such as tacho and sensor signals and signals from operator buttons and temperature monitoring devices are registered and processed.

[1] One or several EWKs, depending on the press version

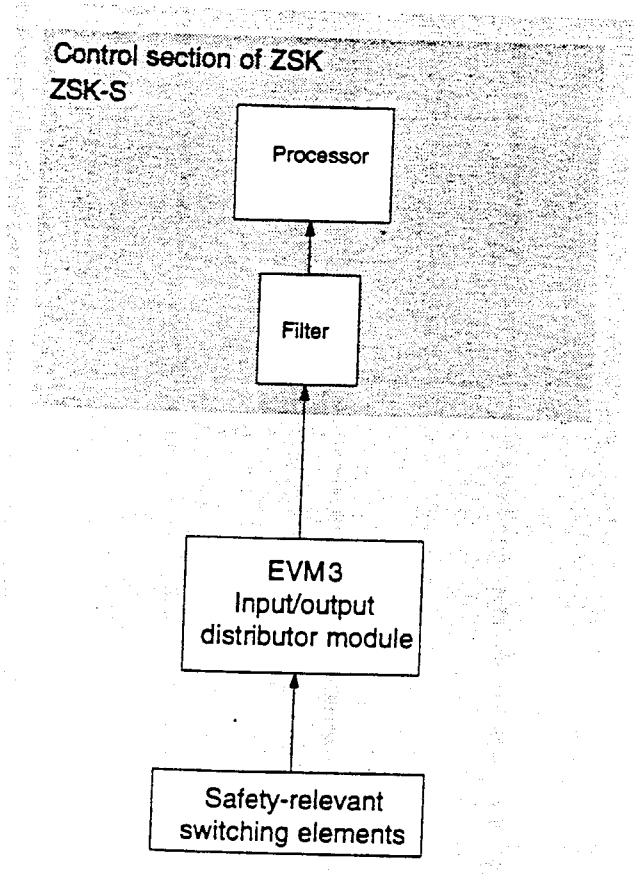
Safety

Safety overview

General

The safety components of the press control system "CPTronic compact" guarantee the safety of the press operator and of the press itself. Technically, these safety and monitoring devices are designed in such a way that the press is always safe, even if one of the electric components fails. In the control system, press protection functions have been implemented which prevent damage in the case of malfunctions or failure of electric components.

Safety inputs

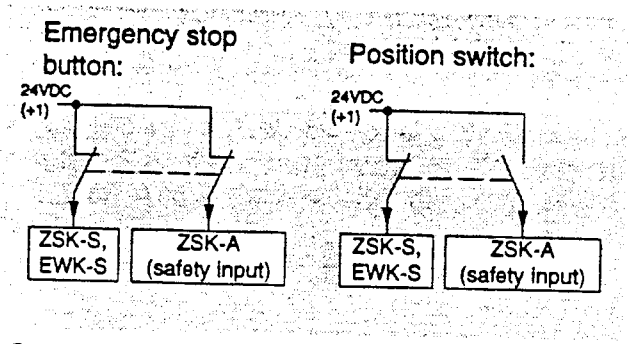


Signal flow of the safety signals

The press is equipped with safety-relevant components such as emergency stop buttons, position switches, guards, main and auxiliary pile stops and finger guards. Actuation of one of these components decelerates the press down to standstill.

The signals from the safety switching elements are passed to the input/output distributor modules EVM3. There the single cores of the switching elements are grouped together to flat cables which lead to the control section of the central control board ZSK. The signals of the safety inputs are filtered on the ZSK, amplified and further processed by the processor of the board.

Safety elements



Connection principle of the safety switches

The signals from the safety switching elements (e.g. "Emergency stop" button) are transmitted via two separate branch circuits. In addition to the safety signal as such, a second signal is passed to the individual control components (e.g. brushless power part BLT) via the control section of the ZSK/EWK. Independently of the safety inputs, these control components also trigger an emergency stop. This ensures the safety function even if one of the branch circuits fails.

ZSK-A drive section of the ZSK

ZSK-S control section of the ZSK

EWK-S control section of the EWK

Safety outputs

On the central control board ZSK safety outputs are provided. If necessary, these outputs can block all connected main, auxiliary and servo-drives of the ZSK. With a further safety output of the ZSK, all auxiliary and servo-drives connected with the extension boards EWK are blocked.

Restarting the press

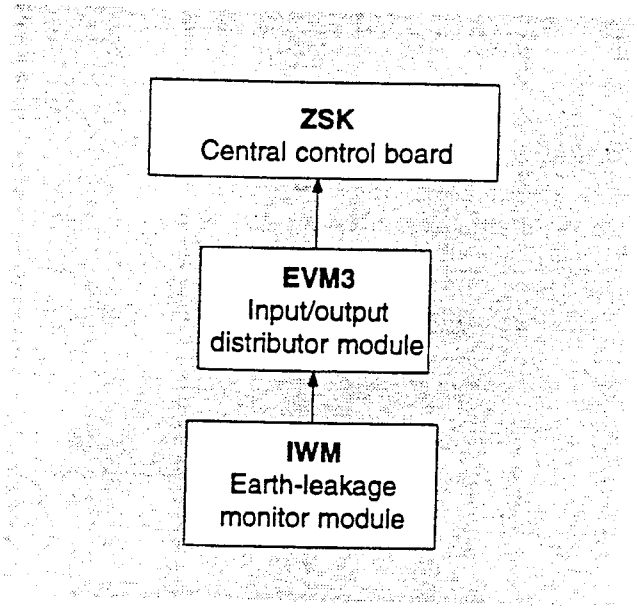
The press can only be restarted, if all safety components are back in the normal operating mode and function state.

IWM Earth-leakage monitor module

Safety function

The earth-leakage monitor module permanently monitors the insulation resistance of the power mains. If an earth fault is detected, it will be signalled to the control electronics. The installation is still ready to run, but the fault *must* be eliminated.

Signal flow



Signal flow after an insulation fault

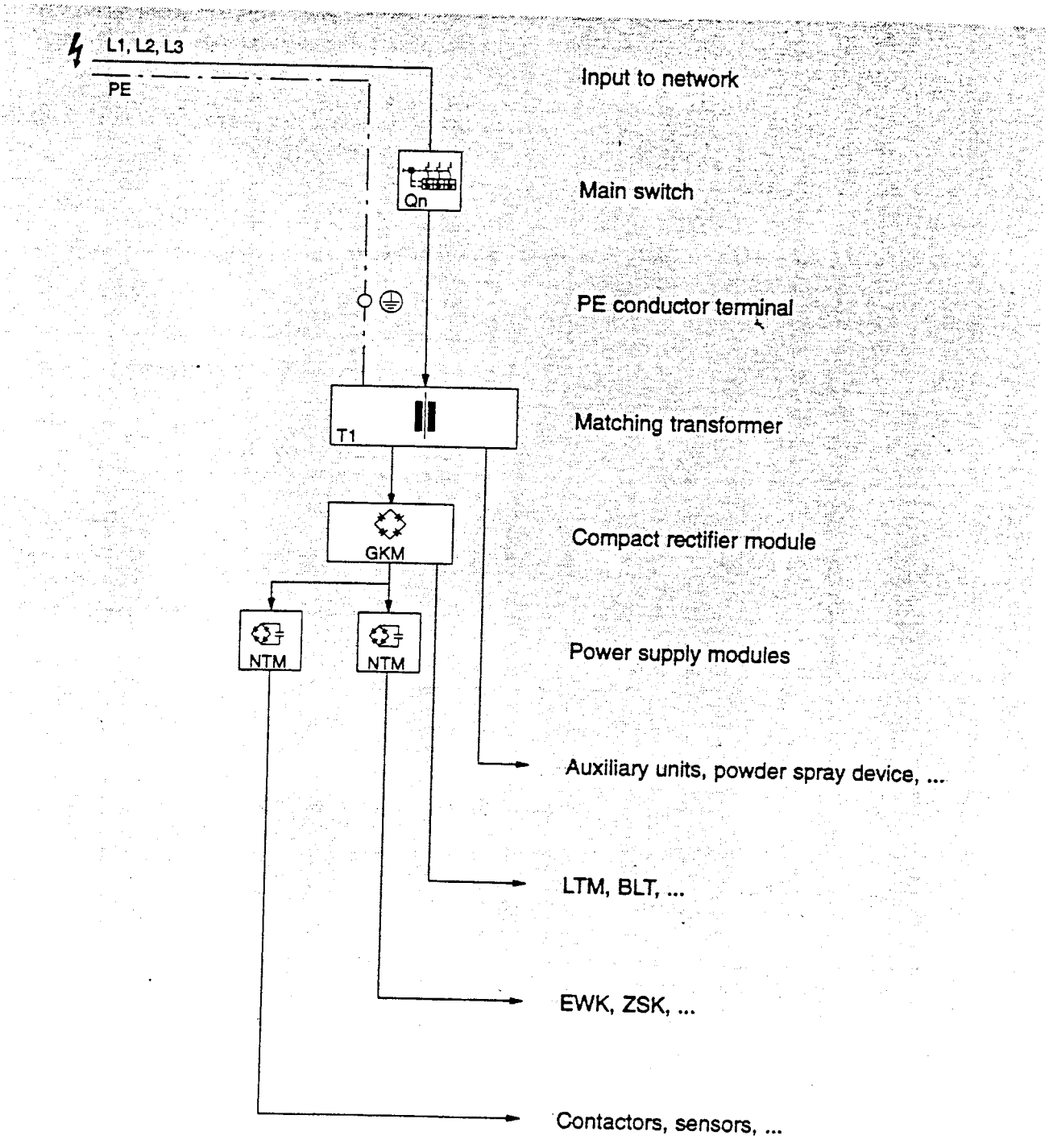
If the earth-leakage monitor module IWM detects an insulation fault, the fault signal is transmitted to the central control board ZSK via the input/output distributor module EVM3 and processed there.

ZSK	Central control board
EVM3	Memory analog board
IWM	Earth-leakage monitor module

Power supply

Relationships

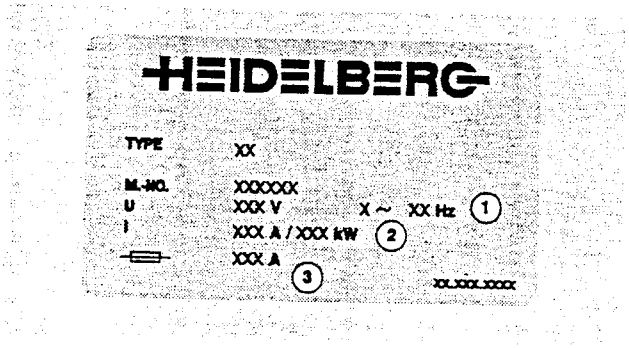
Block diagram



Voltage circuit

Connection to power supply

Power supply is identical for all presses with "CPTronic compact". The mains connection or input to network is effected via the main switch. Behind the main switch, all supply voltages required for the press are made available via the matching transformer. Depending on the component concerned, the voltages are required directly for the consumers of three-phase or alternating current or they are rectified by the compact rectifier module GKM and smoothed and stabilized for different applications (electronic boards) by the power supply module NTM.



Nameplate

Mains voltage/input to network

① Mains voltage, type of voltage, frequency

② Nominal current/nominal power

③ Recommended building-side back-up fuse

The press is supplied with three-phase alternating current with a power frequency of 50 Hz or 60 Hz. The ratings of the back-up fuses depend on the power required by the press and its devices. The power frequency, nominal current and voltage and the recommended building-side back-up fuse are indicated on the nameplate for the electrical equipment.

Main switch

The main switch is a load interrupter with adjustable overload and short-circuit release. The power cable is connected directly to the main switch. For presses requiring more power it is possible to connect two cables to the main switch in order to guarantee the necessary cross-section.

Note:

Observe the local supply conditions!

Matching transformer

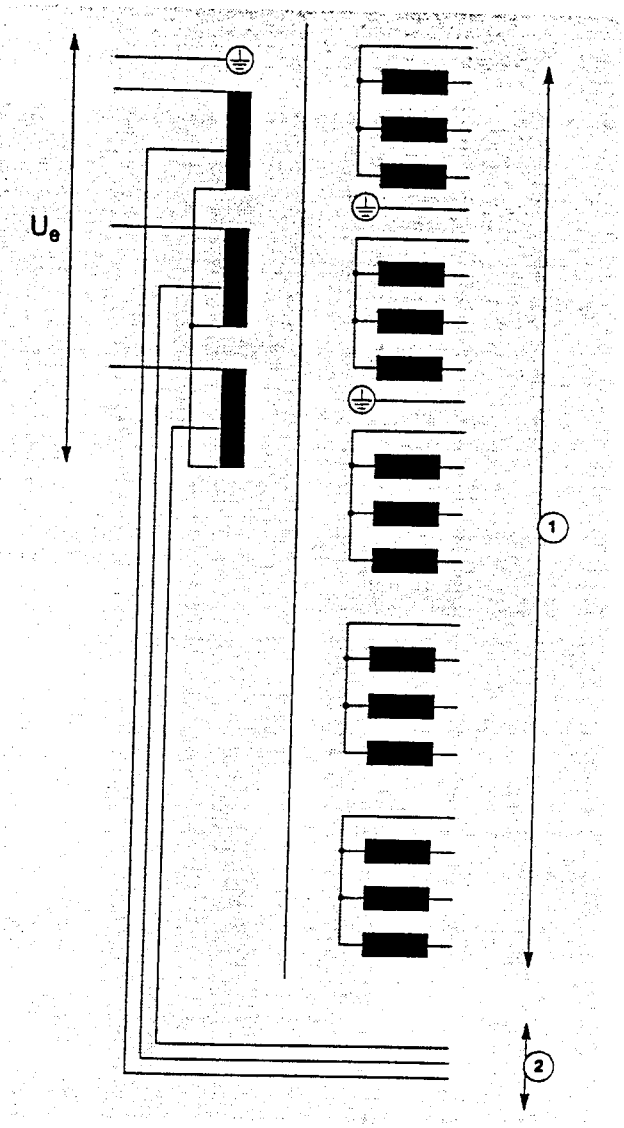


Diagram: matching transformer (example)

① Electrically isolated voltages.

② Non-isolated voltages.

A matching transformer is always required. Its use depends on the press model, local mains voltage and mains frequency. Deviating voltages (supply voltage fluctuations) can be adapted by the matching transformer.

The matching transformer generates different output voltages. On the primary side, several voltages are tapped which are not electrically isolated (autotransformer principle). All output voltages on the secondary side are electrically isolated from the input side.

Note:

Two transformer versions are available:

- transformers working only at 50 Hz or only at 60 Hz which are therefore delivered with the press depending on the country of destination,
- transformers working at 50 Hz and 60 Hz, provided the supply voltage is adapted accordingly.

Voltages not electrically isolated

The non-isolated output voltages supply the three-phase auxiliary units (blowers, compressors) and the external devices (e.g. dampening solution equipment). These auxiliary units are frequency-dependent and are operated at a nominal voltage of 400 V AC and a power frequency of 50 Hz. If the power frequency is 60 Hz, the nominal voltage must be 480 V AC.

Electrically isolated voltages

The electrically isolated output voltages can be divided in four groups:

- voltages which are rectified by the compact rectifier module GKM;
- voltages which are transmitted directly to the three-phase auxiliary drives via the power part modules;
- voltages which are made available to the interface adapter STA and external components such as delivery lamps or static electricity eliminator;
- supply voltage from transformer 13T1 for the display power supply board DNK.

Compact rectifier module GKM

The compact rectifier module rectifies the different voltages of the matching transformer. These voltages are either converted by the power supply modules or used directly to supply certain components (e.g. power part modules).

Power supply module

The power supply module stabilizes the voltages from the GKM which are transmitted to the electronic boards and components.

Input/output control

Signal flow

Components

By input/output control we understand the handling of the input and output signals on the central control board ZSK and the extension board EWK.

The following subassemblies and components are connected to the inputs of the ZSK and EWK and monitored:

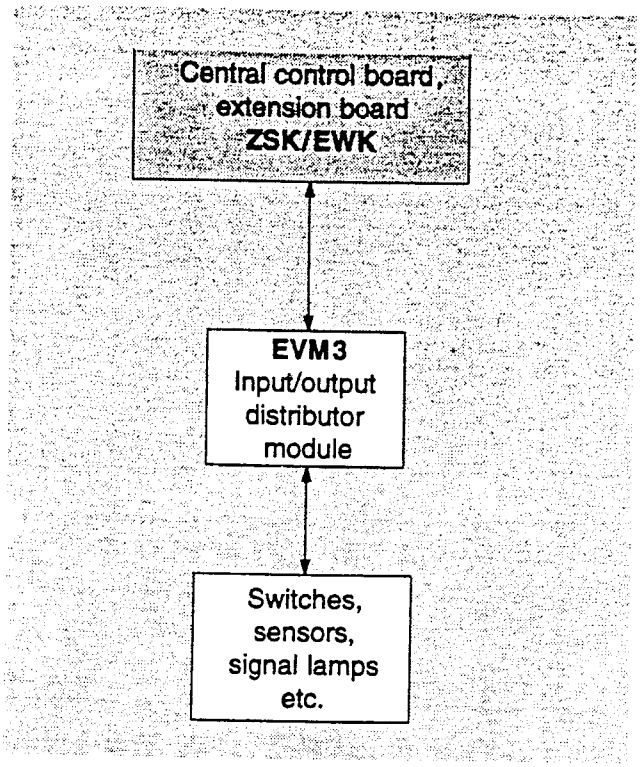
- switches
- buttons
- pressure switches
- motor overload switches
- sensors
- position switches
- electronic subassemblies.

The outputs control the following subassemblies and components:

- signal lamps
- audible signal devices
- solenoid valves
- contactors
- electronic modules
- electronic boards.

The control section of the central control board ZSK is responsible for 128 inputs and outputs and four differential inputs. In addition to the ZSK, the control section of the extension board EWK registers and controls another 128 inputs and outputs and four differential inputs. Since the EWK has no processor, the ZSK is responsible for the signals registered by the EWK. Signals from and to the ZSK and EWK are transmitted via special input/output integrated circuits (I/O-ICs). These I/O-ICs are located on the ZSK and EWK and switch the outputs via output drivers.

EVM3 Input/output distributor module



Input/output control via EVM3

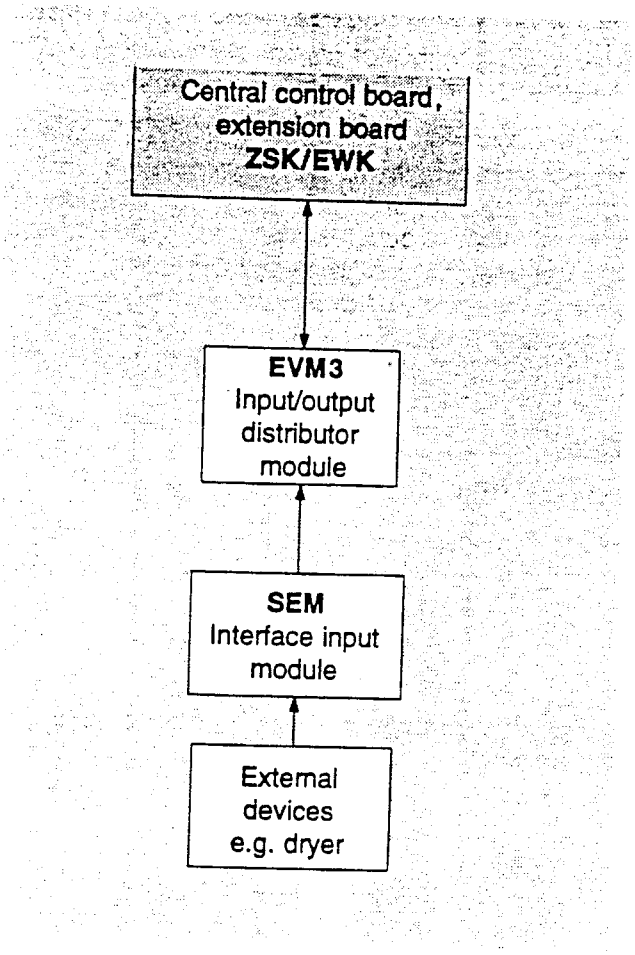
The signals from and to the ZSK and EWK are transmitted via the input/output distributor modules EVM3. One these EVM3 the single cores of the connected components or subassemblies are grouped together to flat cables. The analog signals from the sheet alignment system are passed to the differential inputs of the ZSK or EWK via the EVM3. The signals from the other components and subassemblies are digital switching signals.

ZSK Central control board

EWK Extension board

EVM3 Input/output distributor module

SEM Interface input module



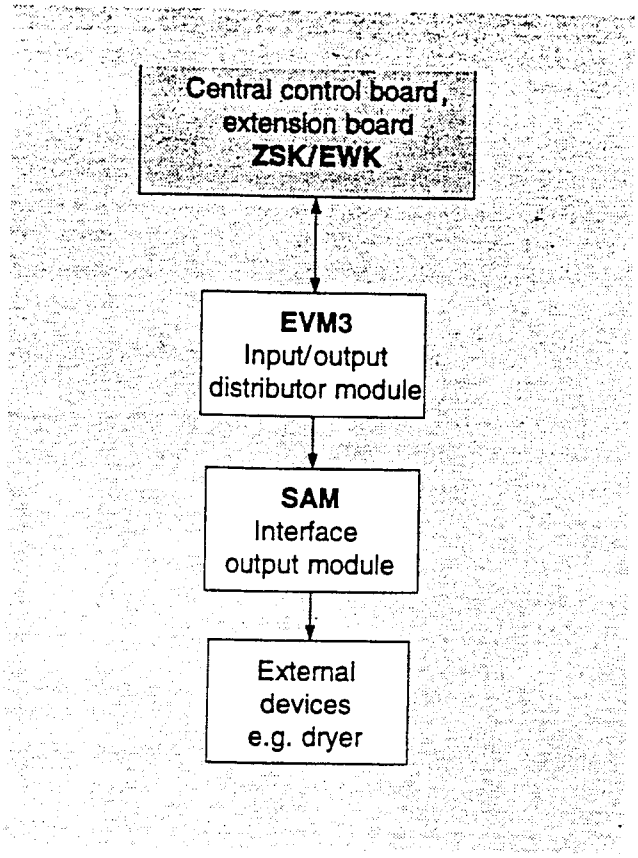
Input control via SEM

The purpose of the interface input module SEM is to isolate the input signals which are passed from the external devices to the EWK and ZSK.

The switching signals from the external devices are passed to the interface input module SEM where they are isolated from the potential of the control electronics via an optocoupler. Via the input/output distributor module EVM3 the signals are transmitted to the ZSK and EWK where they are processed.

ZSK	Central control board
EWK	Extension board
EVM3	Input/output distributor module
SEM	Interface input module

SAM Interface output module



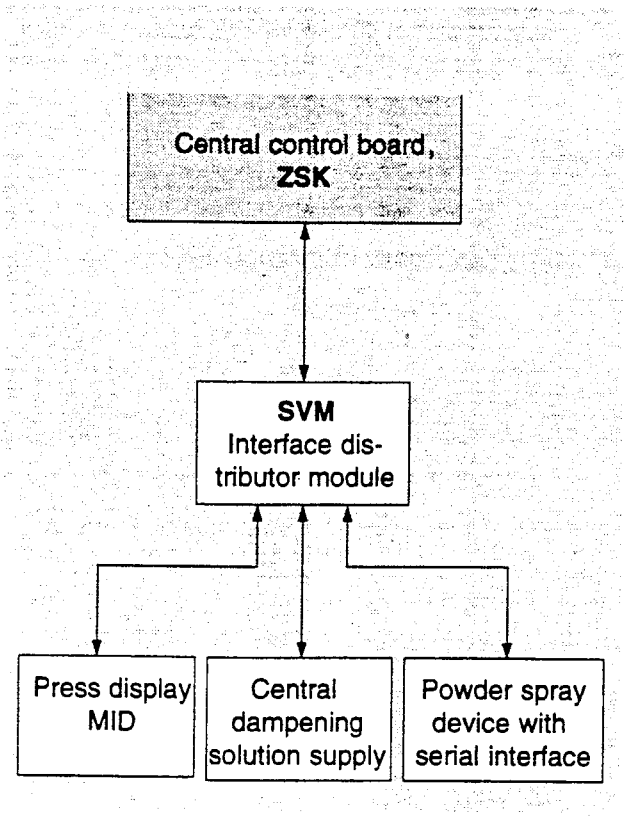
Output control via SAM

The purpose of the interface output module SAM is to isolate the output signals which are passed from the ZSK and EWK to the external devices.

Via the input/output distributor modules EVM3 the output signals of the control electronics are transmitted to the interface output module SAM. On the SAM the output signals are isolated from the potential of the control electronics via optocoupler and then they control the corresponding external devices.

ZSK	Central control board
EWK	Extension board
EVM3	Input/output distributor module
SAM	Interface output module

SVM Interface distributor module



Signal control via SVM

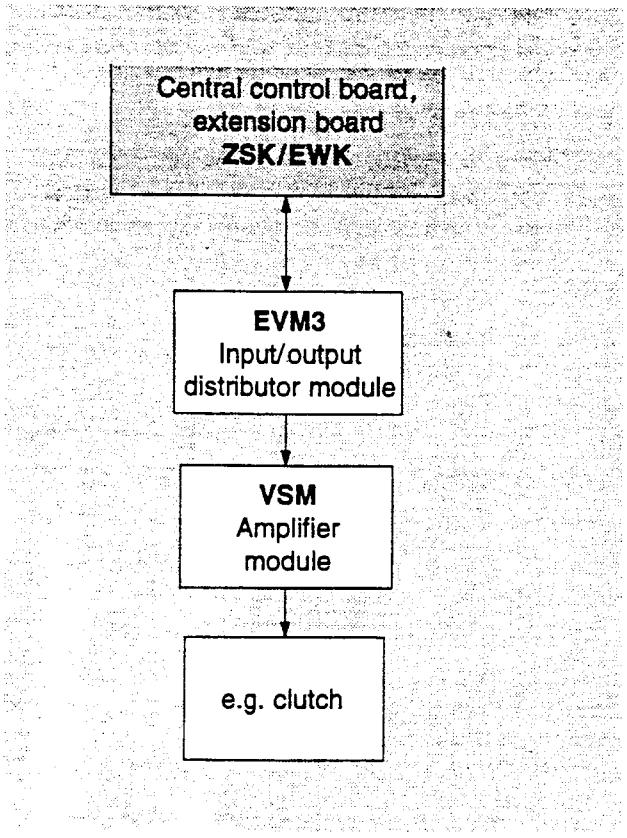
The interface distributor module SVM multiplies the serial interface of the central control board ZSK. Per interface distributor module SVM four serial interfaces are created.

Via the serial interfaces the central control board ZSK, the press display MID and external devices with serial interface communicate with each other.

ZSK Central control board

SVM Interface distributor module

Signal amplification via VSM



Output control via VSM

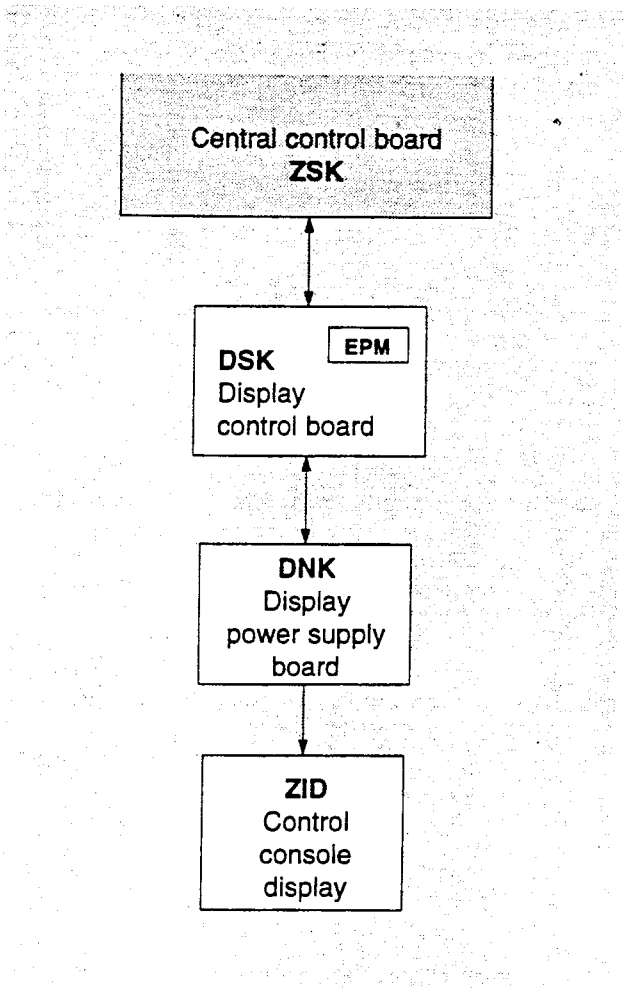
The outputs of the ZSK and EWK can switch max. 2.4 W. For consumers with higher power output the amplifier module VSM (48 W power output) is used.

ZSK	Central control board
EWK	Extension board
EVM3	Input/output distributor module
VSM	Amplifier module

Display control

ZID Control console display

Control



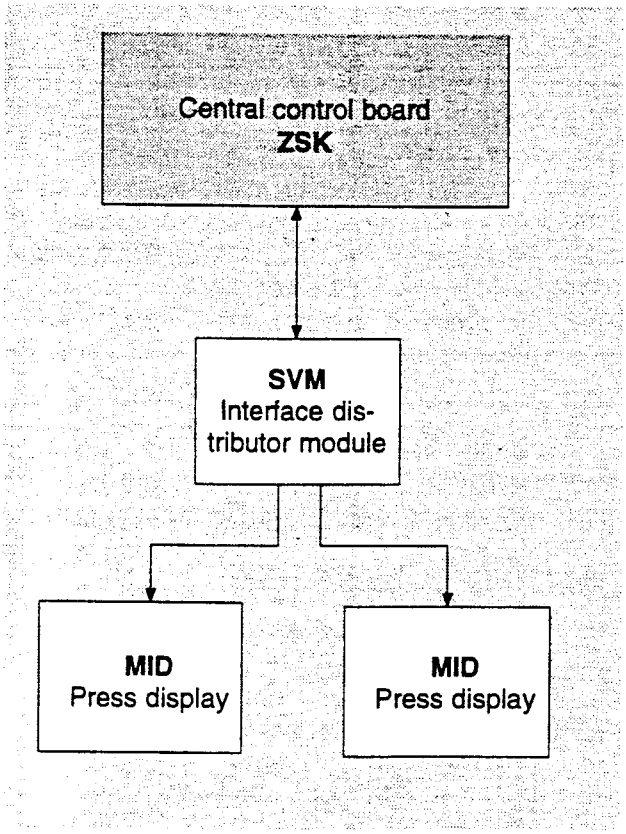
Block diagram: controlling the ZID

The display is controlled by the control section of the central control board ZSK. To control the control console display ZID, the computer of the display control board DSK evaluates the data serially transmitted by the ZSK. With this data and the data from the EPROM module EPM on the DSK, the image to be displayed is built up and stored in the graphic section of the DSK. Via a parallel interface the data is transmitted to the display power supply board DNK. The display power supply board DNK adapts the image data received from the DSK and transmits it to the control console display ZID where it is displayed.

ZSK	Central control board
DSK	Display control board
EPM	EPROM module
DNK	Display power supply board
ZID	Control console display

MID Press display

Control



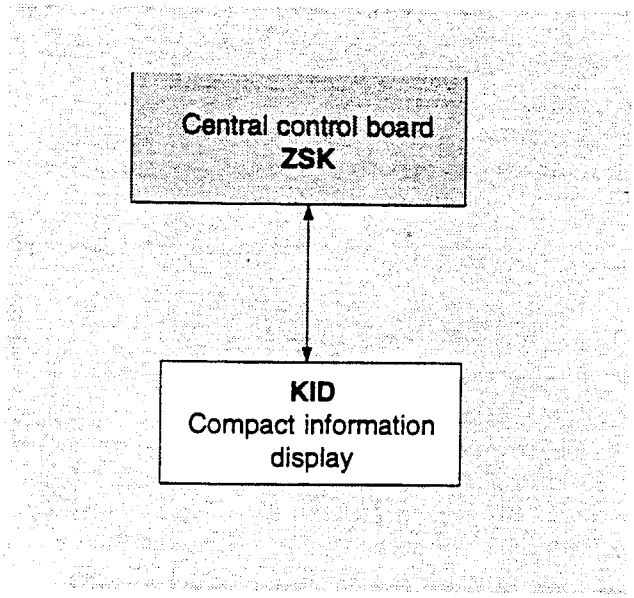
Block diagram: controlling the MIDs

The press displays MID are controlled by the control section of the central control board ZSK. The control signals of the ZSK are transmitted to the interface distributor module SVM. The SVM multiplies the interface of the ZSK. Via the multiplied interfaces the press displays MID are controlled.

ZSK	Central control board
SVM	Interface distributor module
MID	Press display

KID Compact information display

Control



Block diagram: controlling the KID

The compact information display KID consists of the display and an electronic board. Via a parallel interface data is transmitted from the central control board ZSK to the electronic board. The data is processed on the electronic board and appears in the display.

ZSK Central control board

KID Compact information display

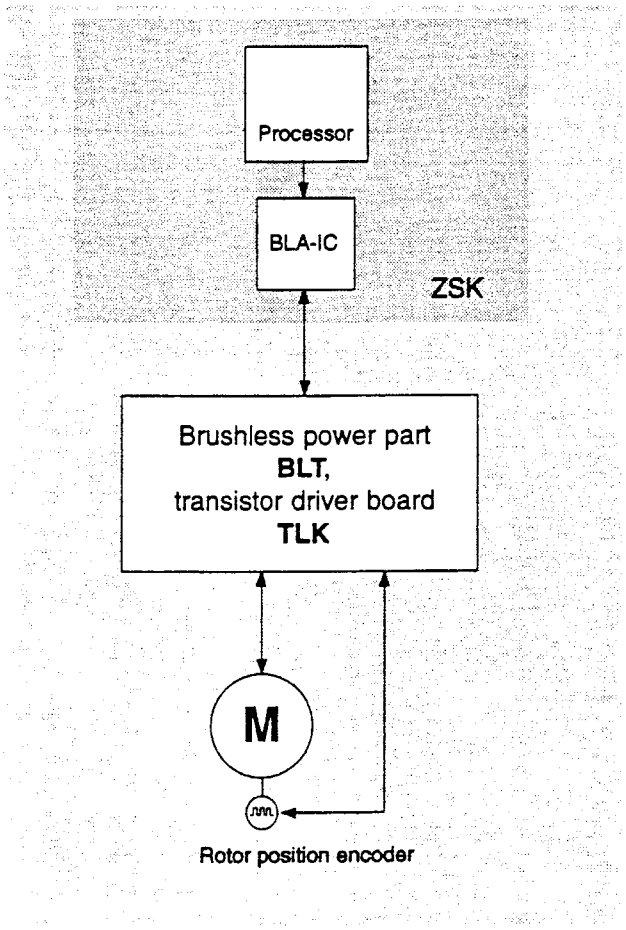
Drives

Main drive control

General

The main drive is the drive unit of the press. It is a brushless d.c. motor with rotor position encoder.

Control overview

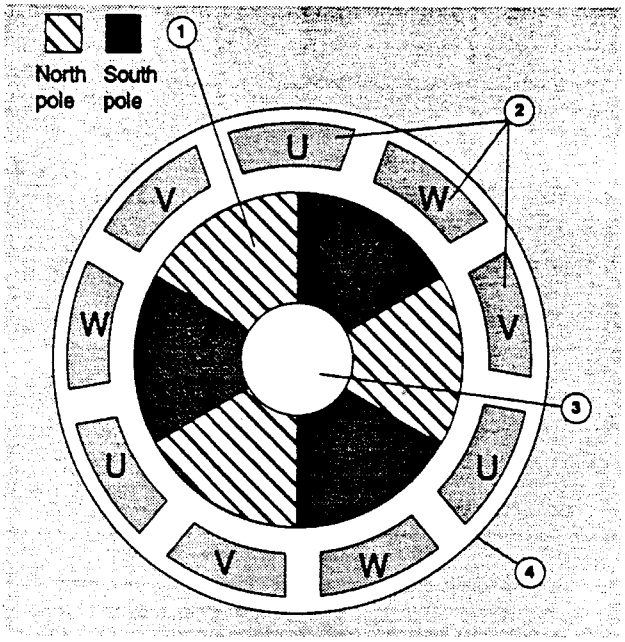


Block diagram: controlling the main motor

The main drive is driven by the drive section of the central control board ZSK via the brushless power part BLT or the transistor power board TLK. The main drive is controlled by a BLA-IC on the ZSK. From the processor the BLA-IC receives presetting information for the main drive. The control signals from the ZSK are transmitted to the BLT or TLK.

The BLT is equipped with the transistor driver board TTK which conditions the control signals. Via six transistors the TTK supplies current to the motor windings. The motor current is determined by a current measuring module SMM and passed on to the ZSK for regulation. The TLK performs the same functions as the BLT, however in a more compact form, i.e. on one board only, and with less power. The intermediate circuit voltage which supplies the motor and the voltages for the electronics of the TTK/TLK are monitored by the BLA-IC. If fault messages are output, the main drive is shut down.

Code resistors are allocated to the components of the brushless power part BLT (SMM, TTK), the TLK and the motor. The ZSK monitors the code resistors and thus checks whether the correct drive components are connected. If the code is wrong, the main drive cannot be started up.

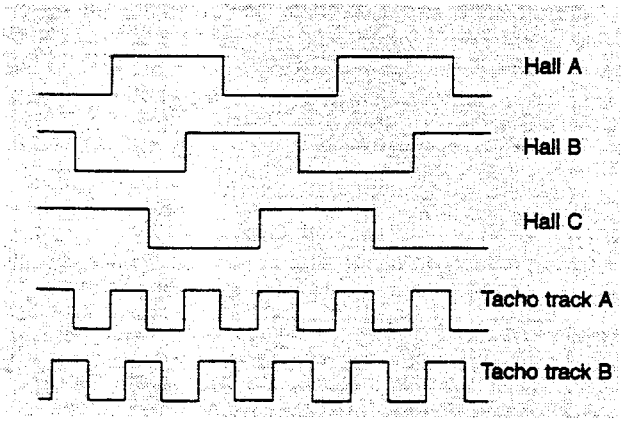


Cross-section of brushless motor

Design

The main motor is a brushless d.c. motor with rotor position encoder. The rotor of the motor consists of a permanent magnet with alternating magnetization. The motor casing contains the motor windings U,V,W, which are supplied with current via the power transistors.

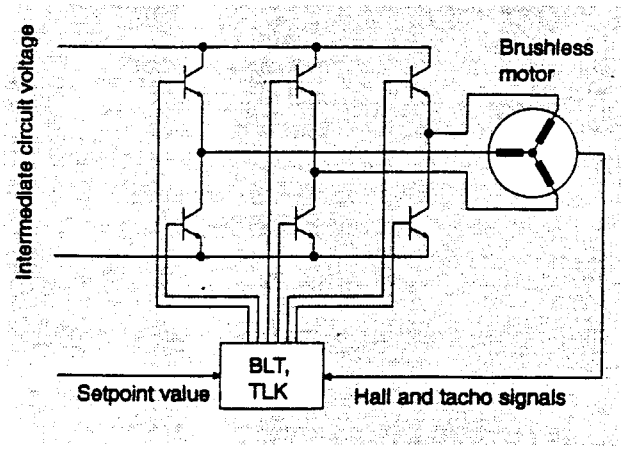
① Multipole permanent magnet
② Motor windings
③ Motor shaft
④ Motor casing



Schematic representation: Hall and tacho signals

Hall and tacho signals

To determine the speed, direction of rotation and rotor position, the rotor position encoder is equipped with 3 Hall sensors (Hall signals A,B,C) and two light barriers (tacho tracks A,B). The brushless power part BLT or the transistor power board TLK receives the generated signals, processes them and passes them on to the drive section of the central control board ZSK.

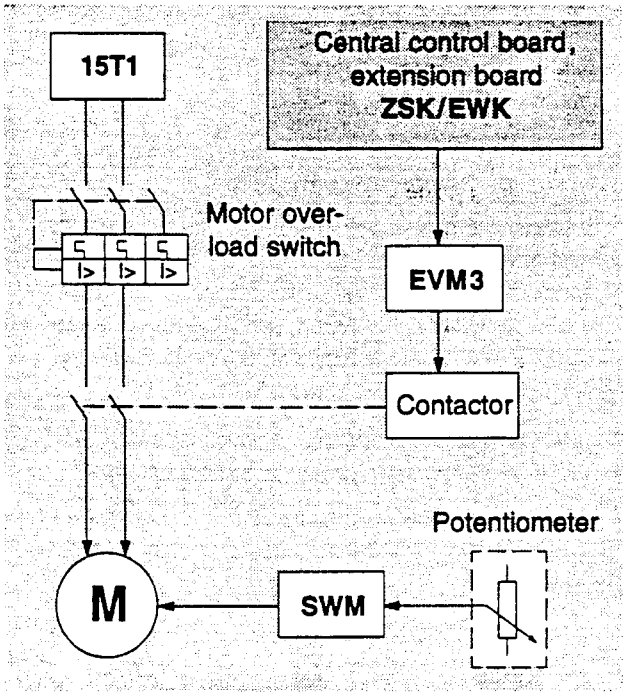


Schematic representation: transistor three-phase bridge

Transistor three-phase bridge

Control is effected by the brushless power part BLT together with the transistor driver board TTK or the TLK. The TTK/TLK controls the six power transistors. These power transistors feed current to the motor windings.

A.C. auxiliary drives



Controlling a.c. auxiliary drives

15T1 Transformer

EWK Extension board

ZSK Central control board

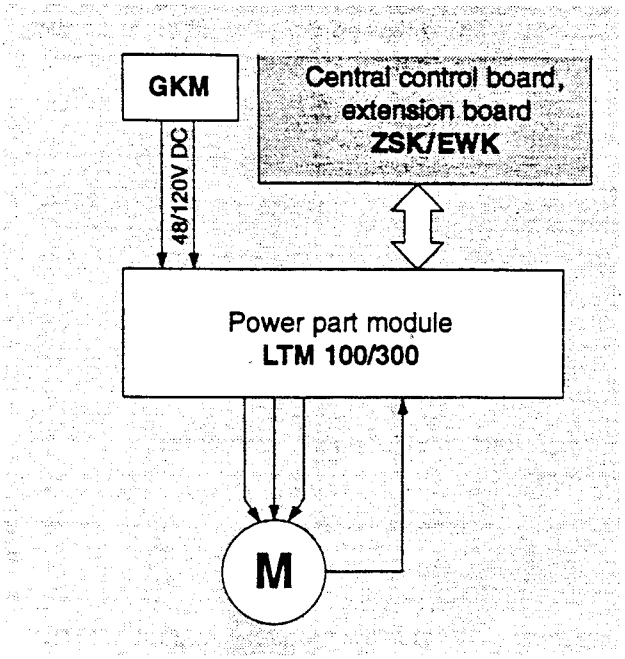
EVM3 Input/output distributor module

SWM Setpoint module

A.C. drives (e.g. sheet decurler, front edge blowers) are brought into circuit by contactors. The ZSK/EWK controls the contactor allocated to the auxiliary drive via the input/output distributor module EVM3. The contactor then switches the voltage through to the motor. The motors have an internal electronic system which controls the motor output. Control is effected via a potentiometer and a setpoint module SWM.

The supply voltage comes from the transformer. The motor overload switch which is in series with the drives is responsible for several a.c. drives.

Control via LTM100 and LTM300



Auxiliary drive control via LTM100/300

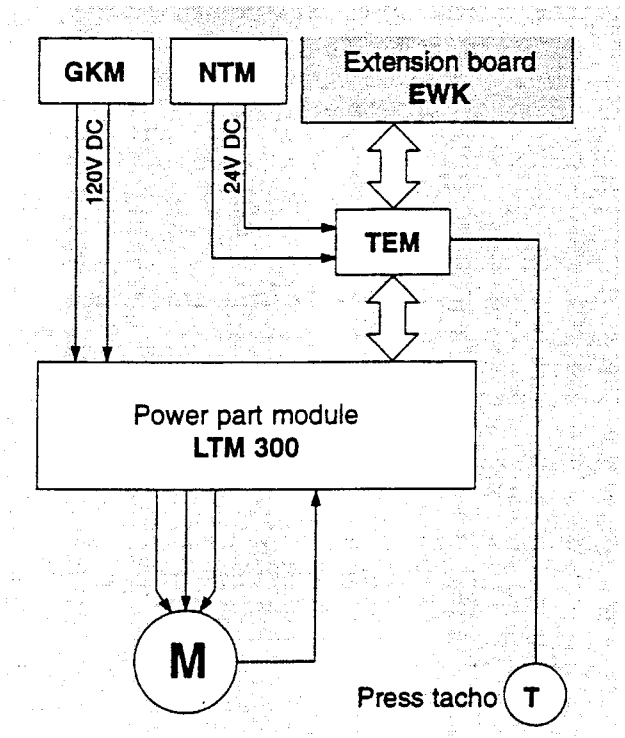
The power part modules LTM100 and LTM300 contain the power electronics required to control the brushless auxiliary drives.

On the basis of the setpoint values received from the central control board ZSK and/or the extension board EWK, the LTMs actuate the different auxiliary drives (e.g. ink fountain roller, pan roller).

The compact rectifier module GKM provides the LTMs with the supply voltage:

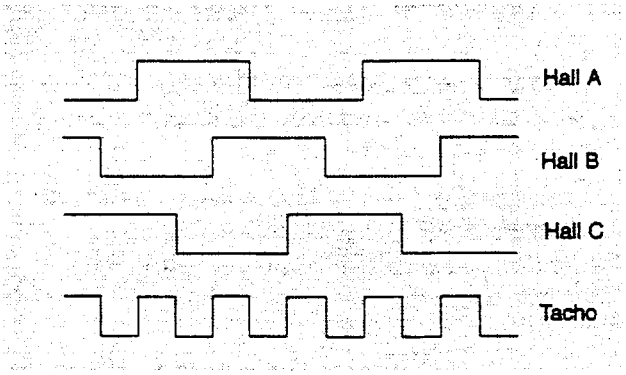
LTM100 – approx. 48V DC

LTM300 – approx. 120V DC



Controlling the auxiliary drive for the sheet reversing device

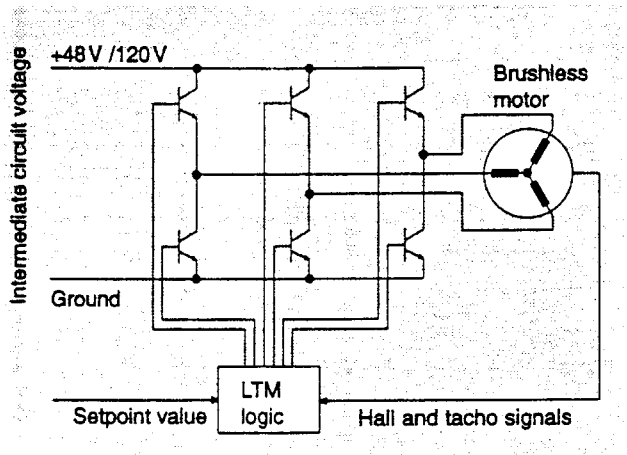
For the auxiliary drive motor for the sheet reversing device the tacho input module TEM is used in addition. A press tacho registers the current position of the press which is then passed on to the control electronics (EWK) via the TEM. The power supply for the TEM comes from the NTM (24V DC).



Schematic representation: Hall and tacho signals

Hall and tacho signals

The drives used are brushless d.c. motors. The casings of the drives contain the motor electronics which, via the power part module LTM, transmits Hall and tacho signals, temperature and code values to the ZSK and EWK.



Schematic representation: transistor three-phase bridge

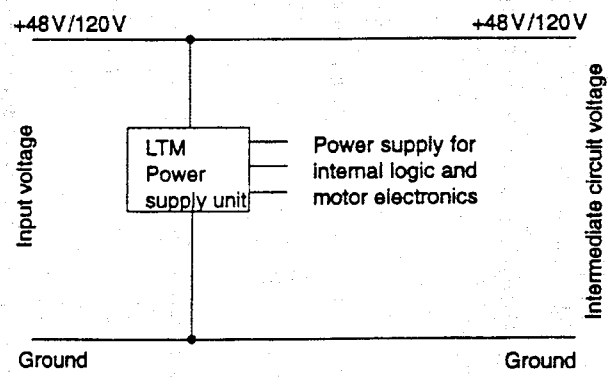
Transistor three-phase bridge

The LTM100 and LTM300 differ by their power output:

LTM100 – approx. 100W

LTM300 – approx. 300W.

From the ZSK or EWK the LTM receives setpoint values which are processed and evaluated together with the Hall and tacho signals of the motor. Via a transistor three-phase bridge consisting of six transistors current is fed to the motor windings. In the case of auxiliary drives with integrated brake the brake is controlled directly by the LTM.

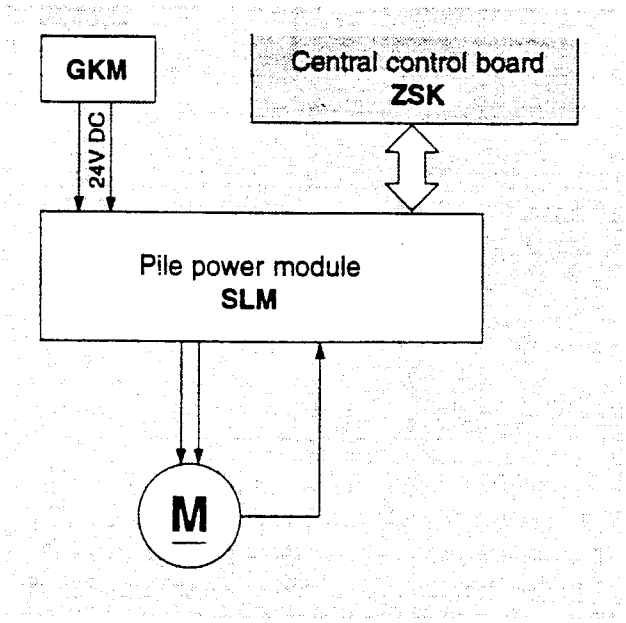


Schematic representation: power supply

Supply voltages

The LTM100 and LTM300 differ by their supply voltages. The LTM100 receives 48V DC and the LTM300 receives 120V DC. The voltages for the internal logic of the LTM and for the motor electronics are generated from these 48V DC or 120V DC.

Control via the pile power module SLM

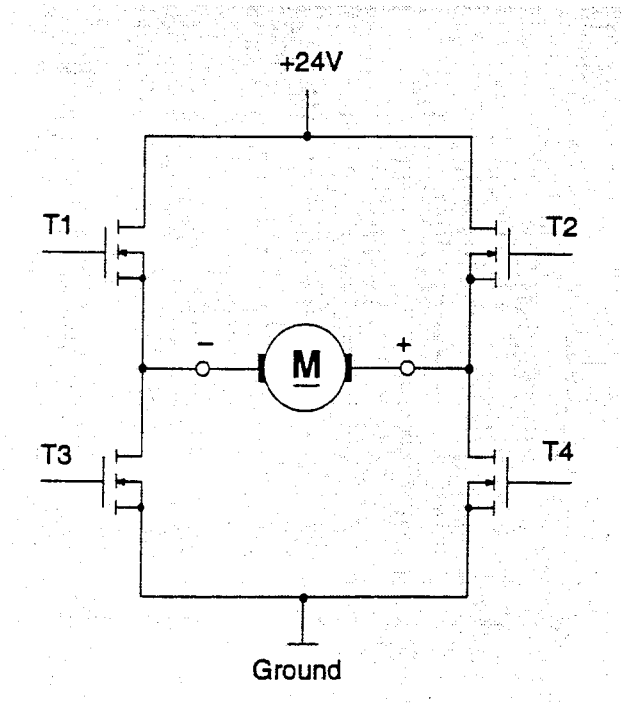


Controlling the pile drives via the SLM

The pile power module SLM controls the pile drives of the press.

The pile motors are d.c. motors with built-in tacho. Based on the information received from the central control board ZSK, the pile power module SLM feeds current to the pile motor. The motor is controlled intermittently. The built-in motor tacho monitors the distance the pile board travels (defined number of motor revolutions corresponds to defined distance). This monitoring function is only used for the pile drives at the feeder.

The power supply for the pile drive comes from the compact rectifier module GKM (24V DC).

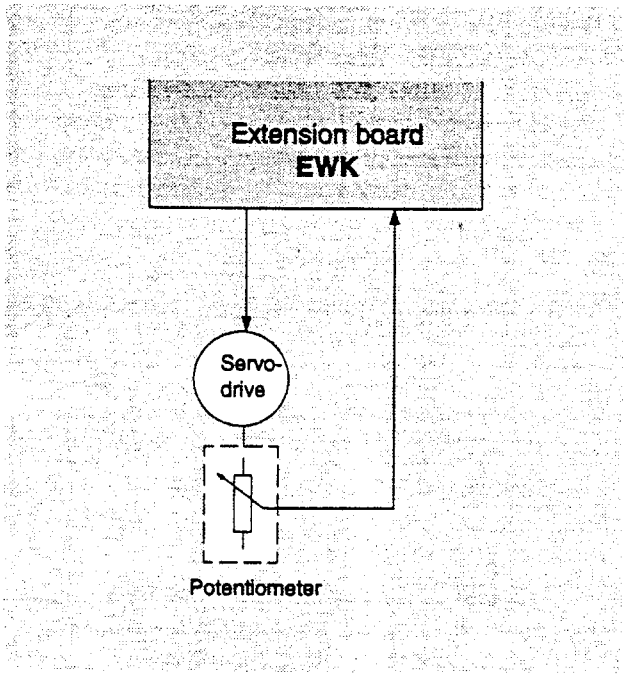


Power transistors with pile drive

The central control board ZSK transmits the setpoint values necessary for motor operation to the pile power module SLM. The electronic system on the SLM then controls the pile drive with the transistors T1, T2, T3 and T4. In the process, the motor is supplied with current via the + and – connection of the power transistors. Polarity reversal changes the direction of rotation.

Servo-drive control

Control overview: servo-drives



Controlling the servo-drives via the EWK

General

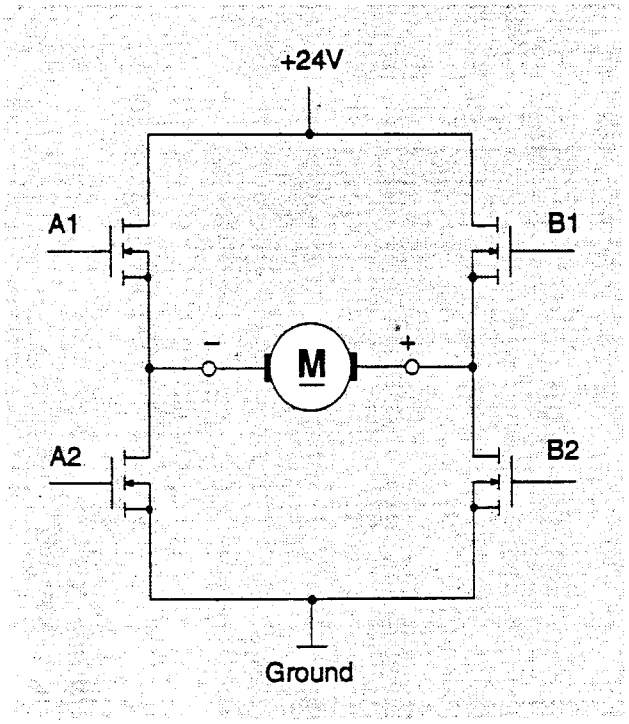
Servo-drives are used to position final controlling devices. These drives are only operated while the final controlling device changes its position. Servo-drives are d.c. motors with brushes which are equipped with a potentiometer for position feedback.

Control

For control of the servo-drives the central control board ZSK and the extension board EWK are required. All functions for control of the servo-drives are integrated in the servo-drive section of the EWK. The EWK can control and monitor up to eight servo-drives.

EWK Extension board

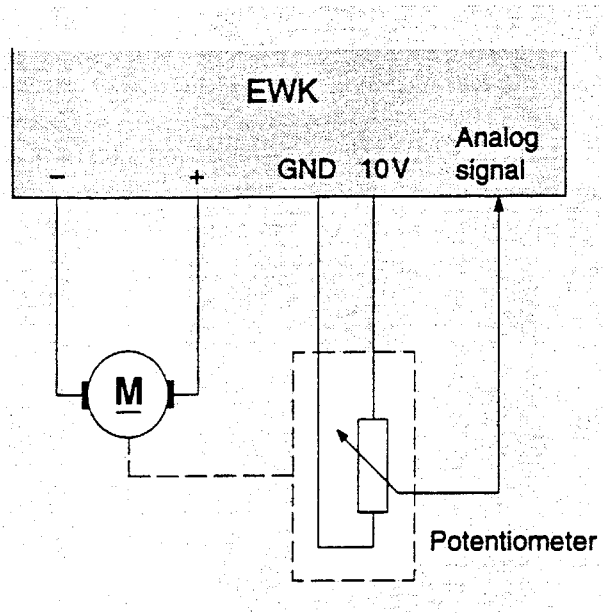
Control principle



Power transistors with servo-drive

Power transistors for motor control

The processor on the ZSK generates the setpoint values and transmits them to the EWK via the interface IC (dual-port RAM). The setpoint values for positioning are processed in the processor for the servo-drive IC. With the transistors A1, A2, B1 and B2 the servo-drive IC controls the servo-drive. During this process, the motor is supplied with current via the + and – connection.



Servo-drive motor with position feedback

Potentiometer feedback

Position feedback is obtained by means of a potentiometer at the servo-drive. The supply voltage for the potentiometer is 10V DC. The centre-tap of the potentiometer is read via the analog voltage inputs of the EWK. The voltage which is proportional to the potentiometer setting is transmitted to a multiplexer on the EWK. The multiplexer is responsible for all analog inputs of the EWK. The analog signals are digitized by an A/D converter which transmits the digital values to the processor of the EWK. The processor on the EWK compares the setpoint values with the actual values from the position feedback. If the values differ, the processor corrects the position of the servo-drive until the actual value and setpoint value coincide.

Abbreviations

Standardized code letters are used for general electrotechnical equipment.

Example:
S for switch, H for signal lamp

AEM	Drive extension module
ANB	Operating panel at feeder
ANK	Sensor sheet alignment control
AUB	Operating panel at delivery
AUM	Analog conversion module
BLT	Brushless power part
CPC	Computer Print Control
CPT	CPTRONIC
DBE	Double-sheet detector
DGP	Basic display board
DNK	Display power supply board
D.S.	Drive side of press
DSK	Display control board
DWB	Operating panel at printing unit
EAM	Input/output module
EPM	EPROM module
EVM	Input/output distributor module
EWK	Extension board
FÜK	Sensor overshooting-sheet control
FVM	Flat-cable connection module
GKM	Compact rectifier module
HLM	Auxiliary drive logic module
HTM	Auxiliary drive driver module
IDS	Encoder
IWM	Earth-leakage monitor module
KID	Compact information display
KLM	Compact power module
KSP	Compact control console
KVM	Terminal amplifier module
KVT	Heat sink unit
LTM XXX	Power part module (XXX = 100 or 300 W)
LVT	Distribution box
MID	Press display
NTM	Power supply module
NVM	NV-RAM module
O.S.	Operator side of press
PU	Printing unit
REK	Processor board
RER	Backplane of computer plug-in unit
RSK	Plug-on control board 120 V
SAK	Memory analog board
SAM	Interface output module
SEM	Interface input module
SMM	Current measuring module
SSM	Servo-drive conversion module
STA	Interface adapter
STM	Pile control module
SUM	Signal conversion module
SVM	Interface distributor module
SWM	Setpoint module
TEB	Manual
TEM	Tacho input module
TLK	Transistor power board
TTK	Transistor driver board
VSM	Amplifier module
ZID	Control console display
ZSG	Central control cabinet
ZSK	Central control board
ZSP	Central control console

Description of pin abbreviation CPtronic RSC-Bangkok, Futterlieb

EAR

---EAxx_PAx = input or output,ref. to I/O list[input high=24VDC=on, output low=gnd=on]
---EAxx_SAx = input or output,ref. to I/O list ["]
---EAxx_SP1 = daisy chain pulse-output upper plug[24VDC pulse]
---EAxx_SP4 = daisy chain pulse-output lower plug "
---EAxx_SP3 = daisy chain pulse-input upper plug "
---EAxx_SP6 = daisy chain pulse-input lower plug "
---/AB_x = adressebus
---/DB_x = databus/bidirectional
---/WR = write signal[µpc write data]
---/RD = read signal[µpc read data]
---/ACKN = acknowledge of EAK(not used for SEK)
---/INIT = carry out initiation of bus-arbiter
---/EAINIT=init for SEK, output of EAK during power-up display time of reset
---EARES = reset for EAK
---/BLFQ = for flash function, i.e.light-bulbs flash function
---/1.25MHZ = system clock, synchronise all multibus-linked p.c. boards
---/EAxx_INT = interrupt from EAK to ESK
---SE_xE_x = safety input of SEK
---/HWxNOT = hardware emergency signal x,SEK output x
---CODEx = slot code 8 to B of plugged board to declare slot address
---SEK_TST = init signal for SEK
---BEWSP = SEK output a5
---/BETRSP = SEK output a6
---TIPPOGR = SEK output a7
---TIPPMGR = SEK output a8
---SSSP = SEK output a9
---SExHA = SEK output 10 to 13
---/SRNOT = not used
---SERE = not used

n.c. = not connected / used
---/ =low active
--- =high active

NTK`s

---HA_UIO_x = voltage ok signal of NTK for HAK supply
---BR_UIO_x = voltage ok signal of NTK for mainmotor-brake & +3terminals
---EA_UIO_x = voltage ok signal of NTK for EAK supply
---/HA_PFI_1 = powerfail of NTK for HAK supply
---/BR_PFI_1 = powerfail of NTK for brake& +3 terminals
---/EA_PFI_1 = powerfail of NTK for EAK supply
---M_MON_xx1 = ground for current-monitoring inputs
---I_MON_xx1 = current-monitoring output of xx NTK
---UREF_xx = general reference voltage
---FERN_xx = remote switch off signal for xx NTK
---I_GRENZ_xx = not used
---/+-SENSE_xx = not used
---AP_xx = actual reference
---A5_xx to A24_xx = preset pins to set output-voltage of xxNTK

---M_x_xx = ground of xxNTK
---+xV_xx = output-voltage of xxNTK
---/-U_EIN_xx = ground input-voltage of xxNTK
---/+U_EIN_xx positive input-voltage of xxNTK

☞SERIAL INTERFACE
---SDA
---SDB = pin A&B[diff. signal] send data(TXD)
---RDA
---RDB = pin A&B[diff. signal] receive data(RXD)
---RSA
---RSB = pin A&B[diff. signal] request to send(RTS),handshake signal
---CSA
---CSB = pin A&B[diff. signal] clear to send(CTS),handshake signal
---DMA
---DMB = pin A&B[diff. signal] data mode ready(DMR)
---TRA
---TRB = pin A&B[diff. signal] terminal ready(DTR)
---EG_x_x =ground of received signals
---NEXTBY = next byte requested(serial interface control)
---MEZG_x = alive signal of external unit connected via s.interface

☞SERIAL INTERFACE(SSK)
---SSSP = SEK output, emergency stop signal for servo drives
---SSRES = reset for SSK
---/SSREQ = SSK request datatransmission from SAK
---SSNFA = remote off for NTK-SSR, when actual current exceed max.current

☞SLOTS
---/INTxx = interruptsignals from ESK
---/BUSY = [high] indicates, the multibus is available, the highest prior arbiter access to the multi-bus and pulls it [low]
---/XACK = acknowledge
---/MWTC = memory write of buscontroller (/MEMW of µpc)
---/IOWC = input output write of buscontroller (/IOW of µpc)
---/AMWC = advanced memory write of buscontroller
---/INH1 = not used*
---/CBRQ = common bus request input/output to indicate from other busarbiter`s a bus request [when they pull it low]to the active bus arbiter the multi-bus-system
---/INIT = input initialise all busarbiter(reset) [low=initialize]
---/MRDC = memory read of buscontroller(/MEMR of µpc)
---/IORC = input output read of buscontroller(/IOR of µpc)
---/INH2 = not used*
---/BHEN = bus high enable, used to enable high data bus D8-D15 in 16bit mode [low=D8-D15]
---/BCLCK = multibusclock 10MHZ from SAK to sync.ser.interf./REK&clockgen.ESK P02

---BPR_x = input, instruct bus arbiter of REK X to be the highest prior arb.on multibus
which should acquire bus access at next /BCLCK[high active]

---/BREQ_1 = output bus request, indicate the busarbiter request multibus access[low active]
---/CPU_ON_x = µprocessor address latch enable have to trigger monoflop within 100ms,
indicating successful bus-acsess(ready ok), otherwise error-rutine&reset
[ok=low]
---BUE =batteryback-up SPK/SAK lower 2.5VDC
---BATT=battery out +3VDC
---TEST_1 = not used*
---TEST_2 = not used*
---/FRG = release signal from SRK to REK1(block regulator when HW1NOT or STP is set)
---/ST_00 = p.interface ch0 REK1 to SRK, handshake
---ST_01 = " ch0 SRK to REK1, handshake
---/ST_10 = " ch1 "
---ST_11 = " ch2 "
---AKZ = actual firing pulse
---VZ_x = pos/neg indication
---SRM_2 = SRK message of faulty data received via p.interface
---SRM_1 = SRK message, firingpulses disenabled or SRK error message
---UB_x = check sum bit (ch x)
---D_00 to D_09 = p.interface ch0, send >100µs data when mainmotor is active
---D_10 to D_19 = p.interface ch2, send >300ns data "
---SEG_1.1 =ground*
---R_ST_11 =not used*
---INTR_1 = p.interface SRK interrupt during it read data from p.interface from REK1
---PRTR_1 = p.interface SRK to REK1 pretrigger signal, get stored until REK1 reacted
---STP_1 = stop for main drive
---IMPF_1 = impulse release input of SRK
---/PFI_1 = input of 5V NTK not ok
---/PFI_2 = output of 5V NTK not ok(>4.75V)
---SYN_1 = sychron signal, synchronising firing-pulses to main voltage supply frequency
---REK1 =brake signal *
---REK2 = *
---REK3 = *
---A_GND = analog ground
---K_X = analog input

☞SRK-SLT
---AG = analog ground analog value
---UD = armature voltage analog value
---UN = main voltage analog value
---UST(USR) = phase ST & SR value
---UF1 = field voltage analog value
---IF1 = field current analog value
---FS = control signal for field-power supply
---RES = not used
---ID1(ID2) = armature current analog value(differece signal)

---TH1(TH2) = temperature analog value
---C11..C22 = code signals
---MG = temp.&code ground
---SIMP = sum impulse of firing pulses
---DG = firing pulses ground
---IMP1...IMP6 = firing pulses
---R1 = forward revolve direction
---R2 = backward revolve direction
---+IMP = powersupply for imp.amplifier
---+IMPN = powersupply for imp.amplifier from SLT
---0VN = ground SLT power supply

☞MSK-BLT
---/FLT = enable BLT[low=release]
---/BR = release break[low=release]
---STP = stop BLT[high=stop]
---REGLER = current / speed control mode[low=current]
---RESET = reset for MSK[high250ms=reset]
---HW1NOT = hardware emergency stop[low=stop]
---PWM = puls-with-modulated set-value for current / speed control [frequ.=2,5khz]
---VZ_PWM = forward / backward main-motor [high=forward]
---ANALOG = set-value for speedregulator [0-10VDC]
---EXT_I = set-value for currentregulator [0-10VDC]
---TACHO_x = encoder-input [differecial signal]
---CODE_STK1 = code-resistor-input
---RES_x1 = not used
---DRH = speed-information calculated of hall-signals[high=right spin]
---DRT = speed-information calculated of tacho-signal[high=right spin]
---NIST_TACHO = tacho-signal
---HW1NOT = hardware-emergency stop signal 1
---FRG.OK = enable offset compensation (for SMM1)
---U/D.OK = up / down offset compensation (for SMM1)
---/FM = error message [low=error]
---/FW = error warning [low=error]
---HALLx = x-hall-signal
---CODEx = coderesistor x
---FM_BR = error-message brake-control[high=error]
---TEMPxx = temparature analog-value [0.134VDC = 30deg., 0.130VDC = 35deg.]
---Tx = transistor-control signal x

☞ENCODER
---IN_x_2
---/IN_x_2
---OUT_x_2
---/OUT_x_2

☞HAR&SERIAL INTERFACE

---SRDx = send&receive data(differential signal pin a&b)
---HADR_x_x = adresse-bus to select HAK & HAK channel
---/HADEF = of HAK to indicate ESK all tests positive
---/KONSET = UIO signal of NTK-HAR
---/STS_x = sender tristate
---/EA_x = ESK to HAK serial-interface switch off
---HARES = reset
---SWNOT = interrupt to selected HAK channel & motor stop[high] after /HW2NOT
---NEXBY_1 = next byte, interface control signal
---/KON_1 = HAK is plugged in slot
---/KST = signal generate reset for all HAK`s, if a HAK is plugged in or out while power on
---CODEx = slot-code of HAK
---LEIx = not used
---KBx = not used

☞PARALLEL INTERFACE(LTK,BAK,STK)

---Tx+ = upper transistor control signal, coil a(TB,TC for coil B & C)}software-commutation
---Tx - = lower transistor control signal, coil a } "
---TA- =[low]speed-up motor, [high]slow-down motor }hardware-commutation
---TB =[high]motor on } "
---TC+ =[high]motor up, [low]motor down } "
---TC- =[high]speed slow, [low]speed fast } "
---CG = ground of 5V NTK-HAR
---CLx = code powerpart
---CMx = code motor
---PWM = pulse with modulated signal(for LTK speed or torque info)(for STK brake on)
---/FLT = power part enable
---BRM = brake quick de-excitation [low motor run]
---WU = low/high speed switch over[high=low speed][pulsed=high speed]
---SH = software/hardware commutation [high = hardware kommutation]
---PGK = power normal/increased *1.5, (high = normal power output]
---RES = reset
---/FW = malfunction warning code, used to request data-read-out from HAK
---/FM = malfunction message code [low until motor is one time operated, after power up]
---DTx = motor tacho signal(STK input HKZ1)}x=a=channel a,x=b=ch. b, x=c=ch. c
---DAx = hall a } "
---DCx = hall b (STK input HKZ2) } "
---DEx = hall c } "
---HA x = ground hall x
---TF = governor foot, approx.. switch 12b69 [high = g. foot not operated]
---FG = additional error signal
---CG = (Mx) powerpart ground (galv. separated from HAK ground)

☞**SSR**

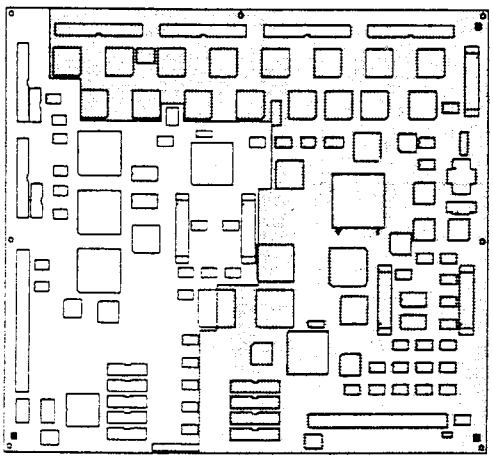
---AG = analog ground
---POTxx_10V = 10V poti supply
---POTxx_GND = poti ground
---POTxx_SL = poti feedback

☞**DISPLAY**

---/VSYNC = vertical sync pulse
---/HSYNC = horizontal sync pulse
---/DATAx = display data
---/SCK = clock
---ENA = display enable

Task

Together with extensions (e.g.PEK/EWK)[1] the central control board ZSK forms the „central processing unit" of the CPTronic compact.
They implement all control functions.
The software required for these functions is stored in the EPROM module of the ZSK.
The ZSK is divided into two essential function areas:

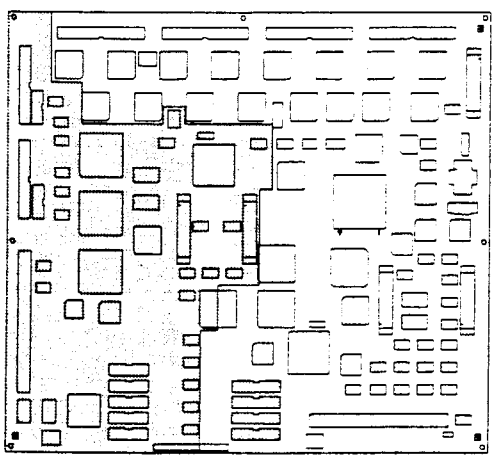


Control section ZSK-S

Control section ZSK-S

The control section ZSK-S is responsible for

- the processes in the electronic control system,
- 128 inputs and outputs and four differential inputs,
- four serial interfaces,
- the interface to the connected extensions.



Drive section ZSK-A

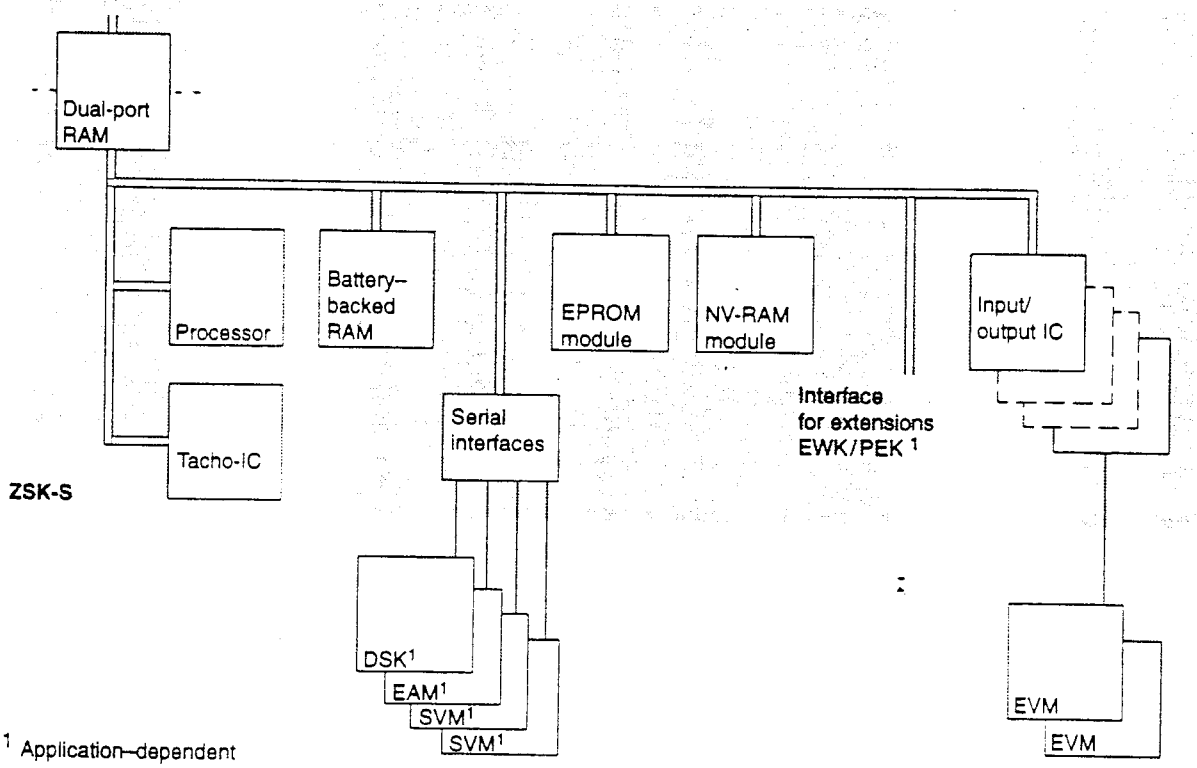
Drive section ZSK-A

The drive section ZSK-A

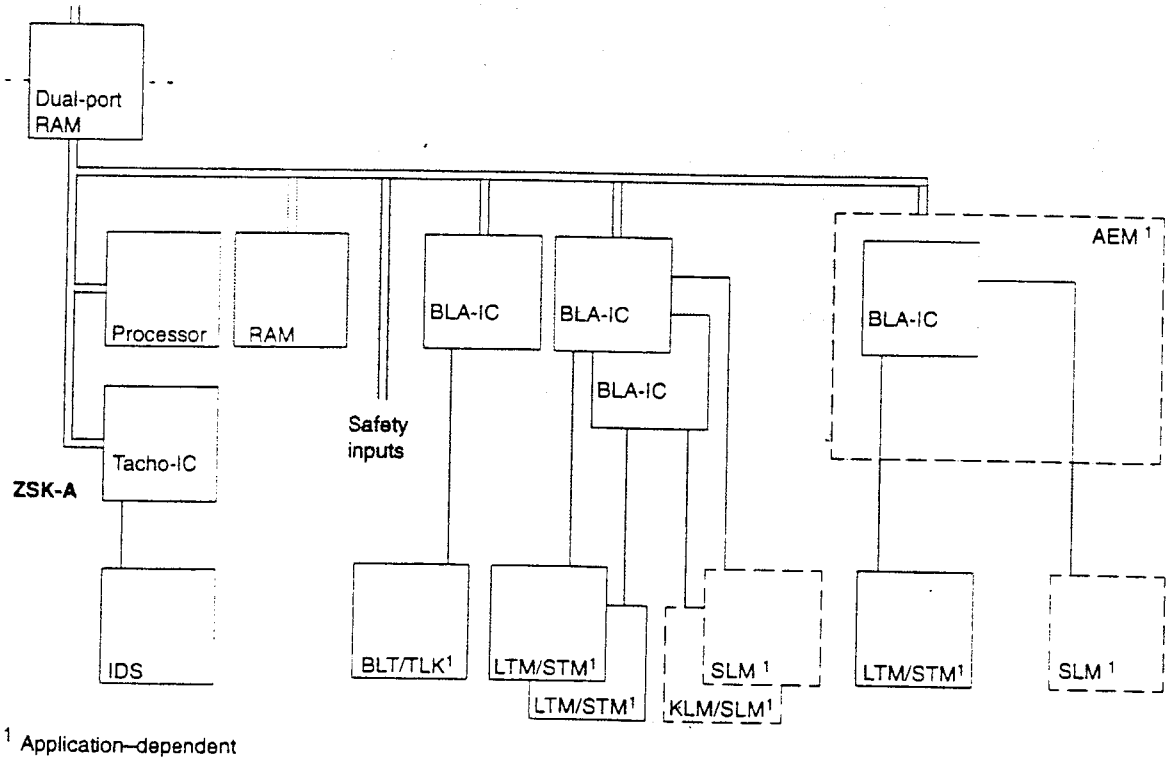
- controls the main drive and auxiliary drives,
- controls the self–regulating auxiliary drives,
- controls other self–regulating auxiliary drives by the AEM [1],
- controls other auxiliary drives by the AEM [1],
- monitors up to 32 safety–relevant redundant inputs.

[1] Application–dependent

Block diagram



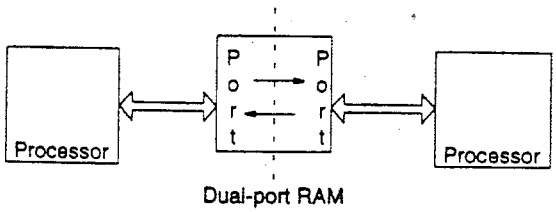
Simplified block diagram of ZSK-S



Simplified block diagram of ZSK-A

Components

Function



Schematic representation of dual-port RAM

The two function areas of the ZSK are almost independent of each other regarding their purpose. Both function areas have their own processors. The communication and data exchange between the two function areas is effected via a dual-port RAM.

Dual-port RAM

The dual-port RAM is a memory IC and serves as interface between the individual function areas. It allows two processors to access the same memory. Both ports can be controlled separately.
Both processors have independent read and write access to this IC. Internal lock–outs ensure consistent information.

Battery–backed RAM, ZSK-S

Printing–related presettings, e. g. dampening values, colour values, setting values for feeder and compressor, are stored in the battery–backed RAM. In the case of a power failure or while the press is switched off, the stored data is retained with the help of a battery or capacitor.

NV-RAM-module, ZSK-S

Press–specific data, e. g. totalizer reading and variant code, is stored in the "non–volatile memory" NV-RAM.
When the press is switched off, this data is not deleted. When the press is switched on again, the stored data can be retrieved.
The NV-RAM is a plug–type module. When exchanging the ZSK, the NV-RAM must be plugged onto the new ZSK to transfer the press–specific data to the new ZSK.

EPROM-module EPM, ZSK-S

The sequential control software of the CPTronic compact is stored in an EPROM-module. The processor of the ZSK-S-part accesses the EPM. The EPROM module is a plug–type module. When replacing the ZSK, the EPM must be plugged onto the new ZSK (see 'Replacing the ZSK').

Input/output integrated circuit (I/O-IC), ZSK-S

The signals from the 24V DC–inputs and outputs (except for safety inputs) for the electronic control system of the press pass through the input/output ICs.
If the I/O-IC has been programmed to serve as output, it switches eight outputs via output drivers. These outputs are short–circuit–proof.
When the I/O-IC has been programmed to input, feelers, sensors, position switches etc. are read in via the inputs.

Tacho integrated circuit (tacho-IC), ZSK-S

For further control functions, the tacho-IC of the ZSK-S receives signals conditioned by the tacho-IC of the ZSK-A section.

Tacho integrated circuit (tacho-IC), ZSK-A

The tacho-IC of the ZSK-A receives the signals of the incremental encoder system IDS (press speedometer).
It serves as an interface between the IDS and the processor of the relevant function area and is used everywhere where degree–dependent control functions are required. This allows direct evaluation of the necessary signals without delays between the function areas.

The following functions are implemented by the tacho–IC:

- determination of speed,
- determination of direction of rotation,
- signal conditioning,
- ...

With the help of these and other functions the pulses coming from the IDS are synchronised, checked, filtered, converted and preprocessed for the processor.

Safety inputs, ZSK-A

The signals from the safety inputs (redundant switches, e.g. emergency stop, position switches) are passed through separate input filters. These input signals are redundant processed by the processor of the ZSK-A-part.

Brushless drive integrated circuit (BLA-IC), ZSK-A

All functions necessary to control a brushless d.c. drive and a self–regulating drive are integrated in the BLA-IC. With its BLA-ICs, the ZSK controls the main drive and the auxiliary drives. The software allocates the BLA-ICs accordingly.
The following functions are implemented by the BLA-IC:

- current regulation,
- winding changeover,
- enabling of power part,
- brake control,
- default for the direction of rotation,
- determination of speed (Hall/tacho),
- . . .

The BLA-IC monitors these functions and generates fault signals for certain malfunctions. The processor in the ZSK–A–part evaluates these fault signals.

① X23 Male connector / auxiliary drives (LTM/STM)

② X24 Male connector / auxiliary drives (LTM/STM)

③ X26 Male connector / self-regulating auxiliary drives

④ X25 Male connector / self-regulating auxiliary drives

⑤ X13 Male connector
- inputs/outputs 1 ... 32 (EVM)
- CPC 3 distributor board CVK [1]

⑥ X9 Screw terminal / ground 5 V (compensating ground)

⑦ X14 Male connector / inputs/outputs 33 ... 64 (EVM)

⑧ X22 Female connector / drive extension module AEM

⑨ X21 Female connector / drive extension module AEM

⑩ X15 Male connector /inputs/outputs 65 ... 96 (EVM)

⑪ X16 Male connector / inputs/outputs 97 ... 128 (EVM)

⑫ X12 Male connector / NV-RAM module

⑬ X3 Male connector / power supply ZSK

⑭ X90 Male connector / power supply ZSK [1]

⑮ X2 Male connector / EPROM module EPM

⑯ X1 Male connector / EPROM module EPM

⑰ X10 Male connector / parallel bus EWK/PEK [1]

⑱ X6 Male connector / serial interface (SVM) [1]

⑲ X18 Male connector / serial interface (EAM)

⑳ X4 Male connector / serial interface (DSK)

㉑ X5 Male connector / serial interface (SVM) [1]

㉒ X27 Male connector / inputs/outputs (EVM)

㉓ X28 Male connector / inputs/outputs (EVM)

㉔ X29 Male connector / inputs/outputs (EVM)

㉕ X30 Male connector / inputs/outputs (EVM)

㉖ X31 Male connector / inputs/outputs (EVM)

㉗ X7 Female connector / encoder HWI

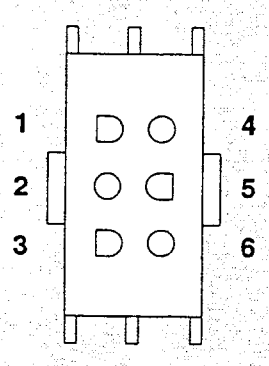
㉘ X8 Screw terminal / ground 5 V (compensating ground),
- extension board for plate image reader PEK [1]

㉙ X20 Male connector / main drive (TTK)

[1] Application-dependent

Pin assignment

X3

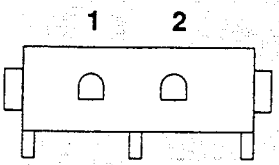


Female connector X3

X3 Power supply ZSK

Pin	Function
1	PFI 5V [2] hi/L = ok
2	5V DC
3	Ground 5V
4	24V DC
5	Ground 24V
6	Ground 24V

X90



Female connector X90

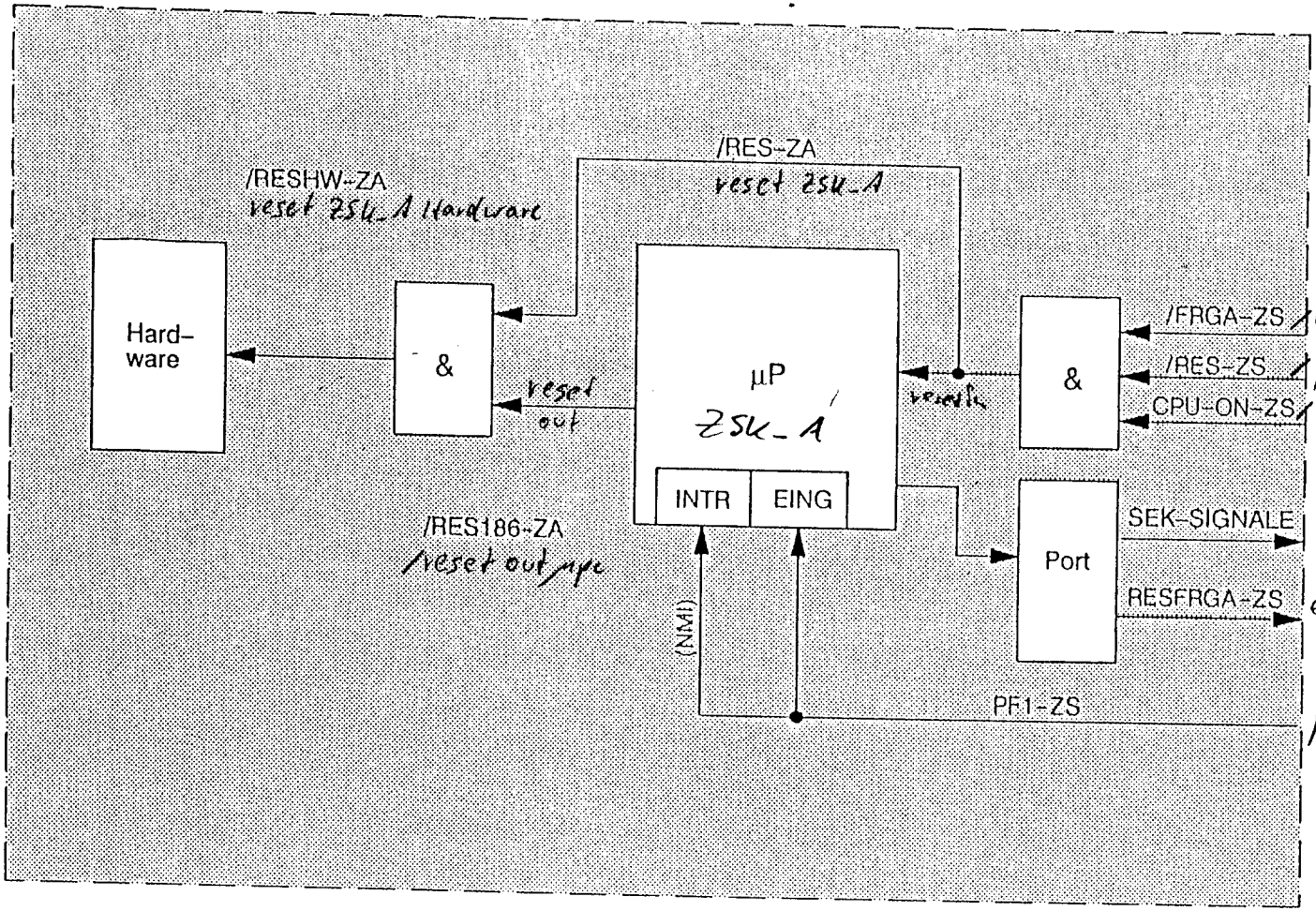
X90 Power supply ZSK [1]

Pin	Function
1	5V DC
2	Ground 5V

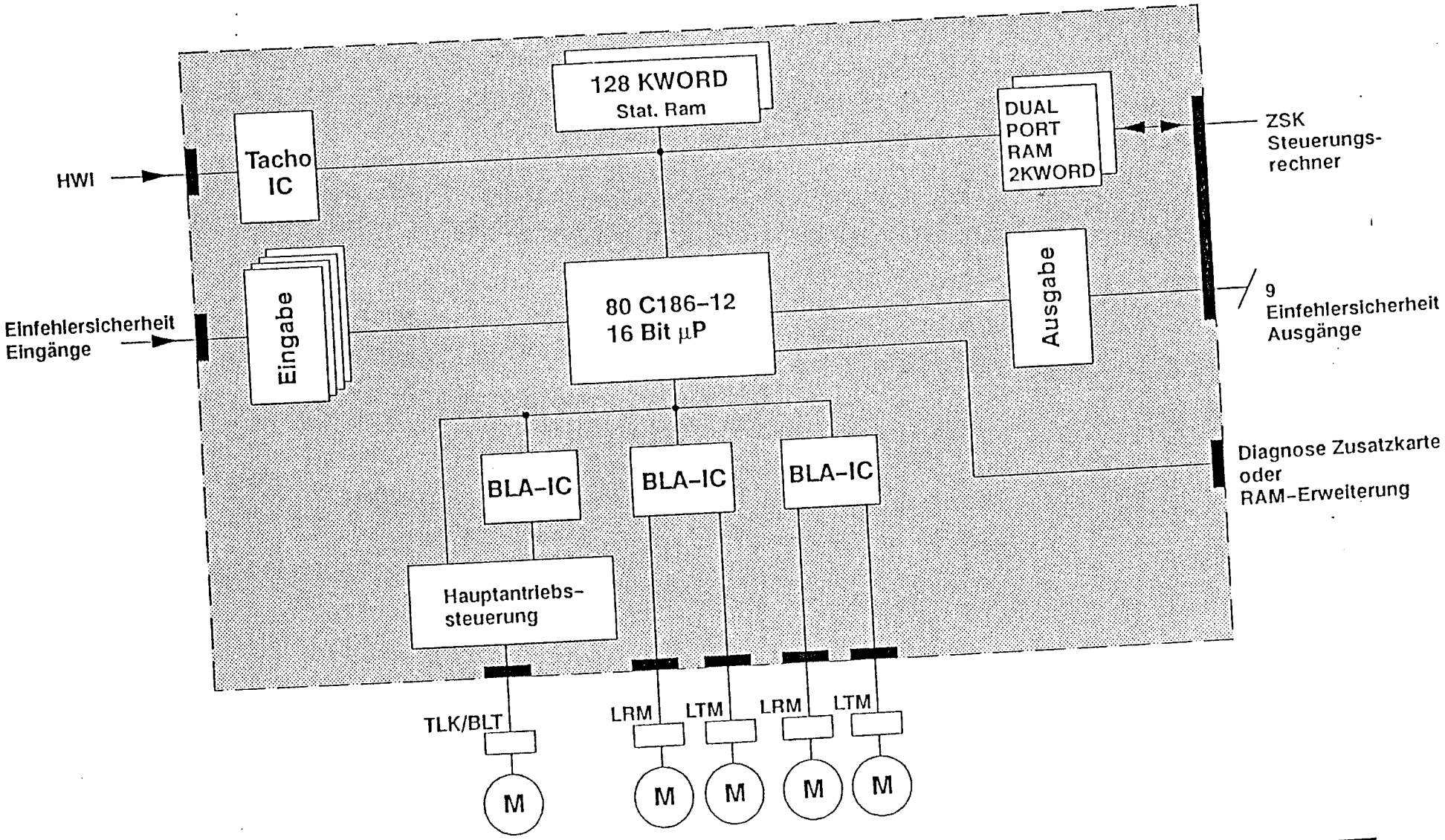
[1] Application-dependent

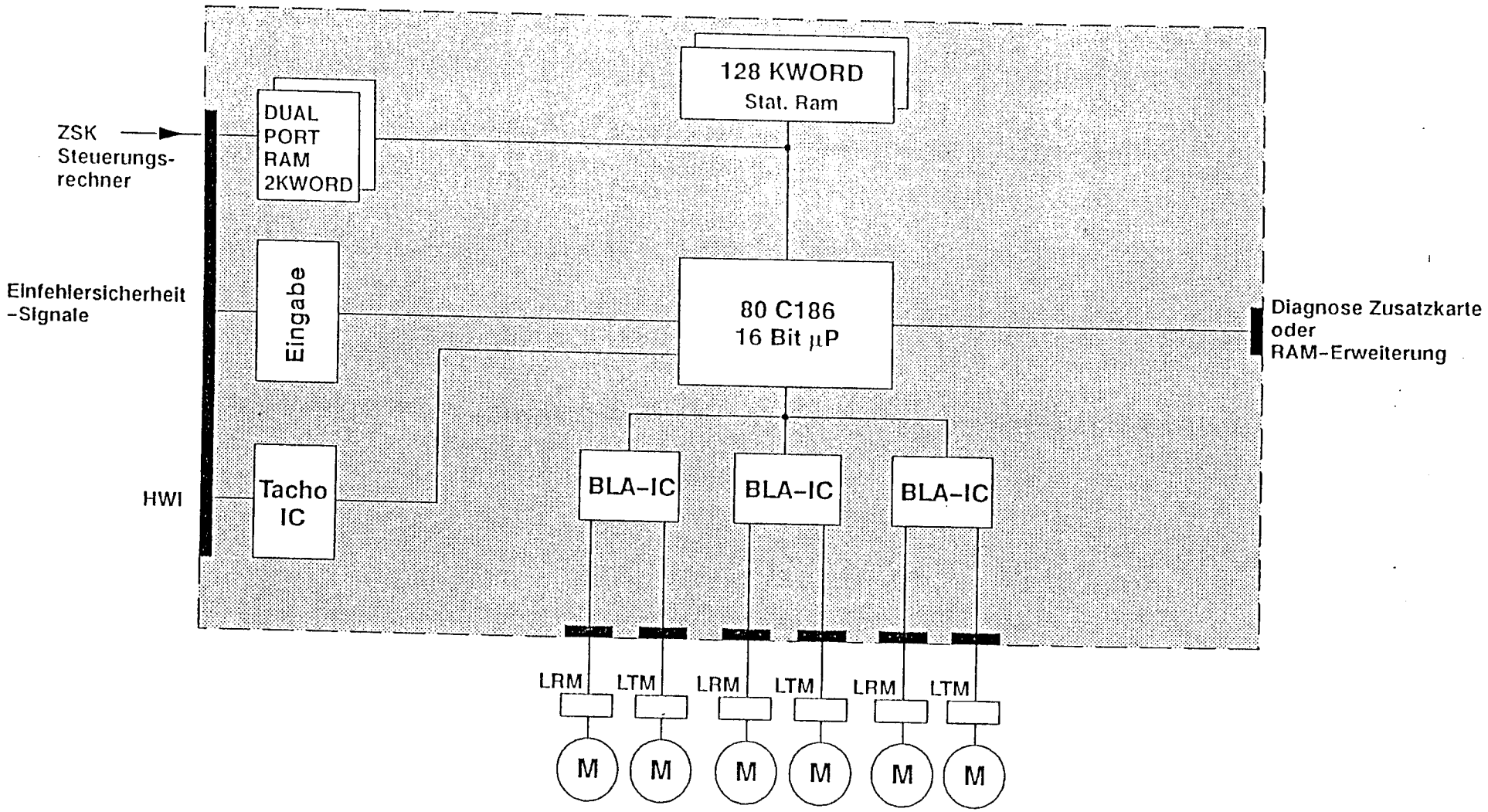
2 Signal is:

0V	U < 4.9V DC	
5V	U > 4.9V DC	→ OK

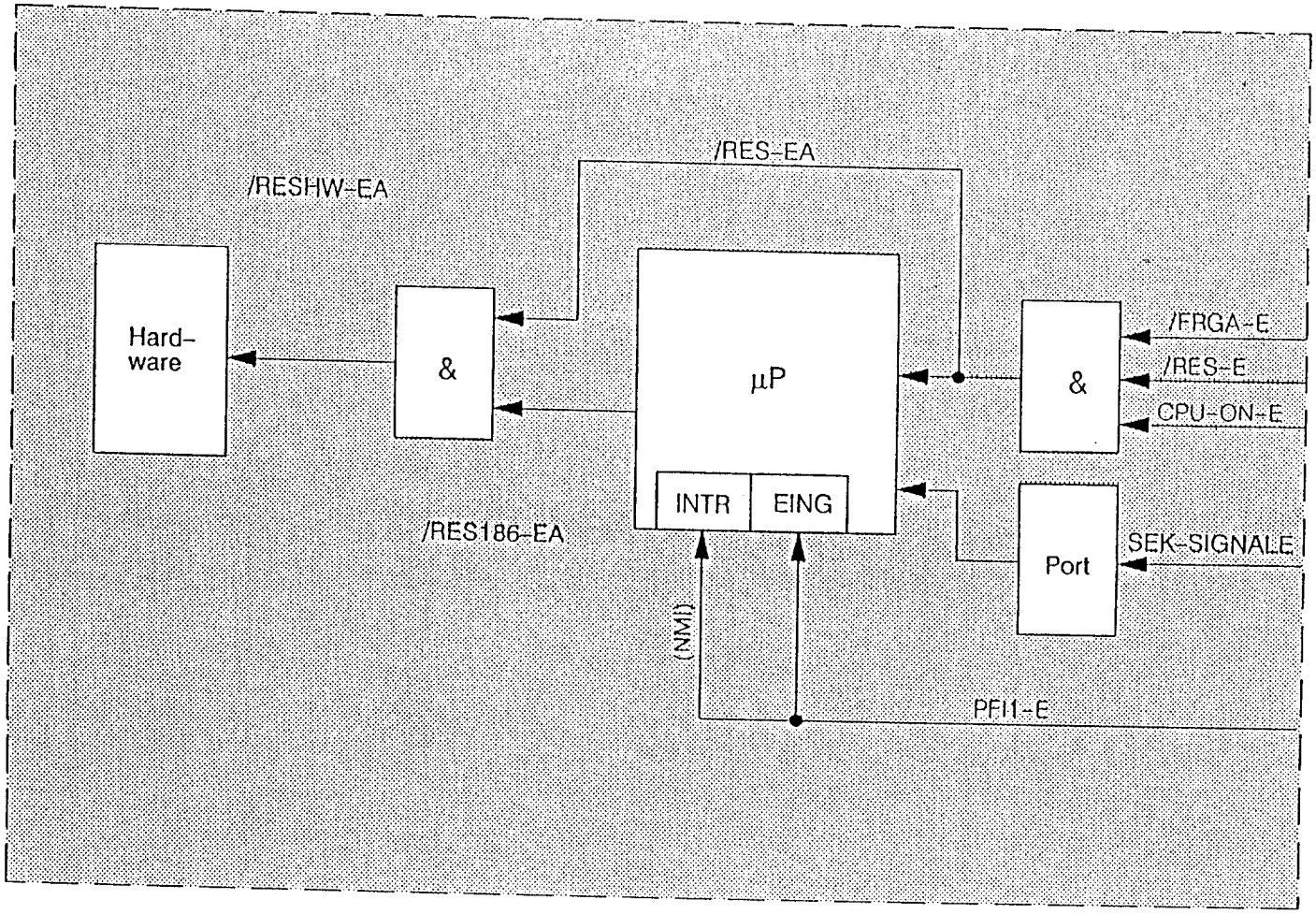


Einfehlersicherheit- und Üb rwachungssignale ZSK/A

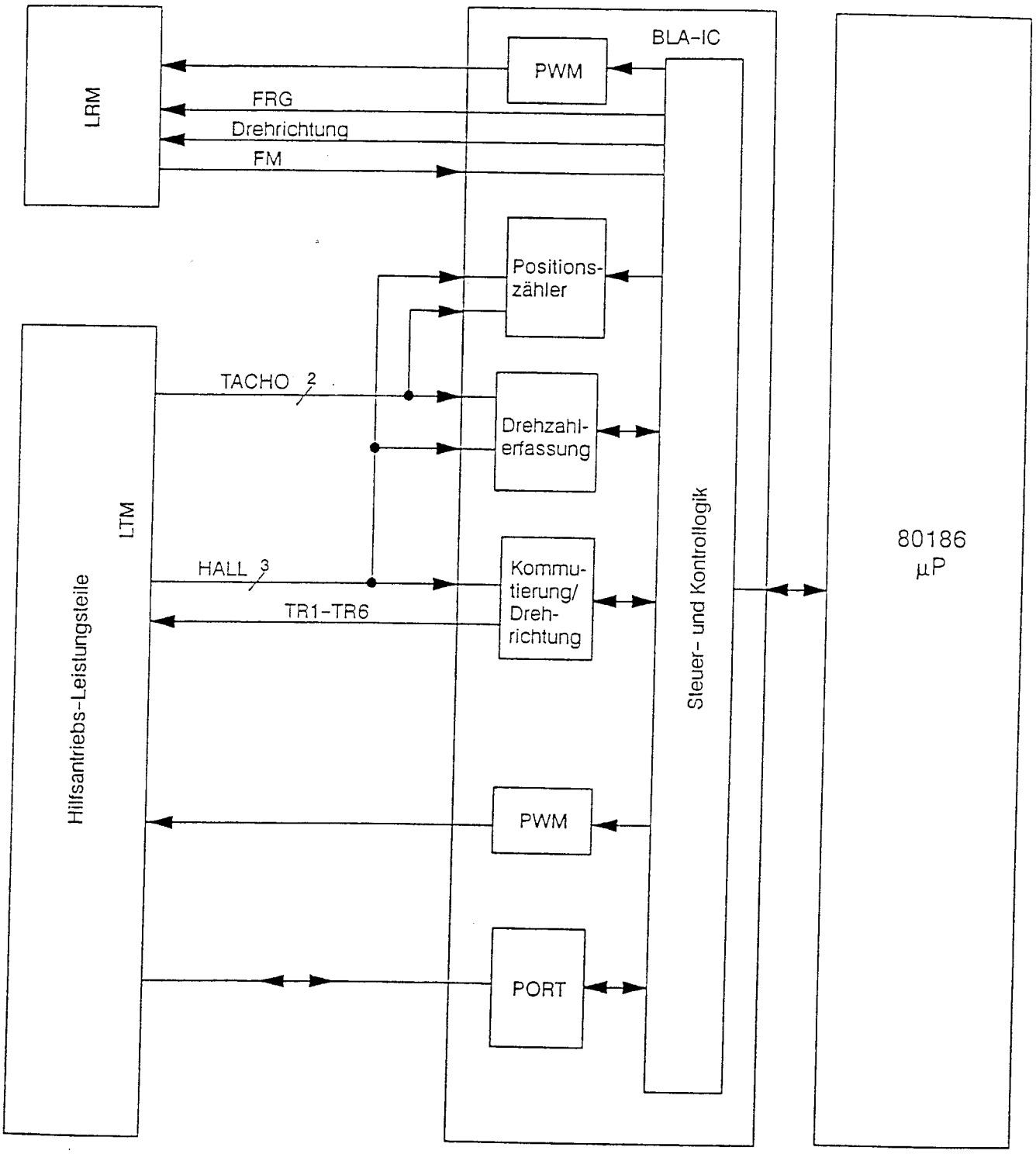

128 KWORD
Stat. Ram
DUAL
PORT
RAM
2KWORD
ZSK
Steuerungs-
rechner
HWI
Tacho
IC
Eingabe
Einfehlersicherheit
Eingänge
80 C186-12
16 Bit µP
Ausgabe
9
Einfehlersicherheit
Ausgänge
BLA-IC
BLA-IC
BLA-IC
Diagnose Zusatzkarte
oder
RAM-Erweiterung
Hauptantriebs-
steuerung
TLK/BLT
LRM
LTM
LRM
LTM
M
M
M
M
M

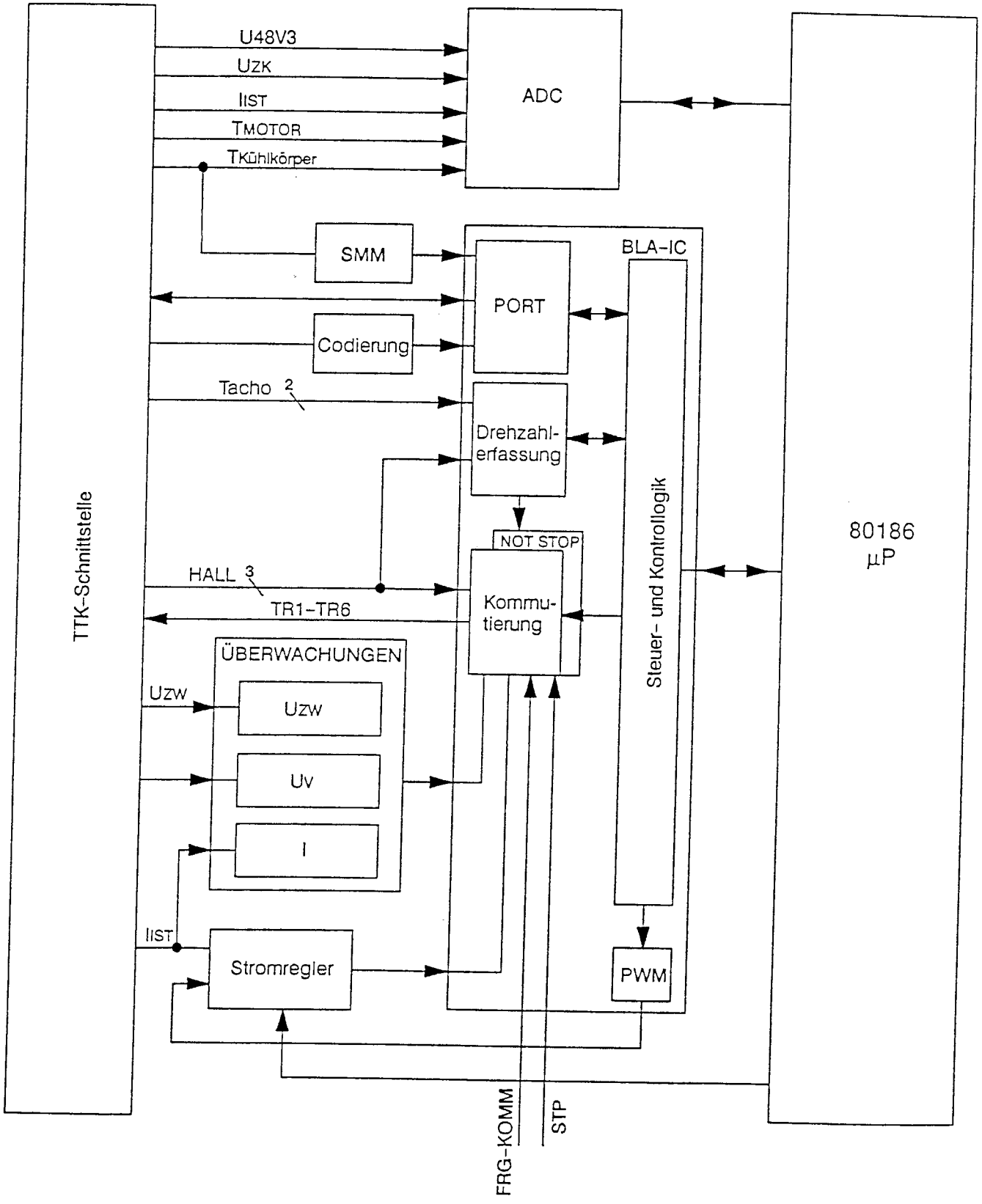


Blockschaltbild EWK/A

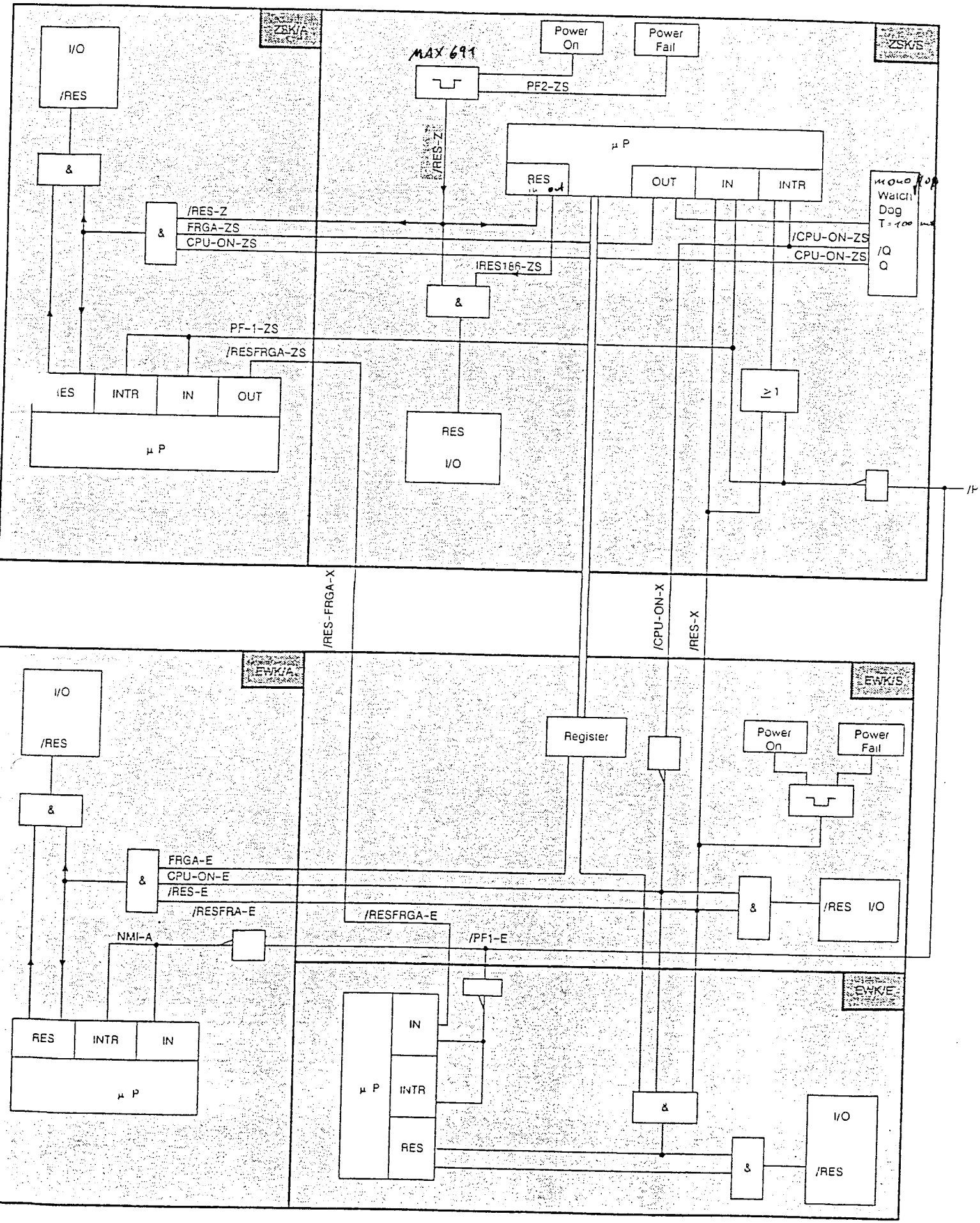


Einfehlersicherheit- und Überwachungssignale EWR A


LRM
BLA-IC
PWM
FRG
Drehrichtung
FM
Positions-
zähler
TACHO 2
Drehzahl-
erfassung
LTM
Hilfsantriebs-Leistungsteile
HALL 3
TR1-TR6
Kommu-
tierung/
Dreh-
richtung
Steuer- und Kontrollogik
80186
µP
PWM
PORT

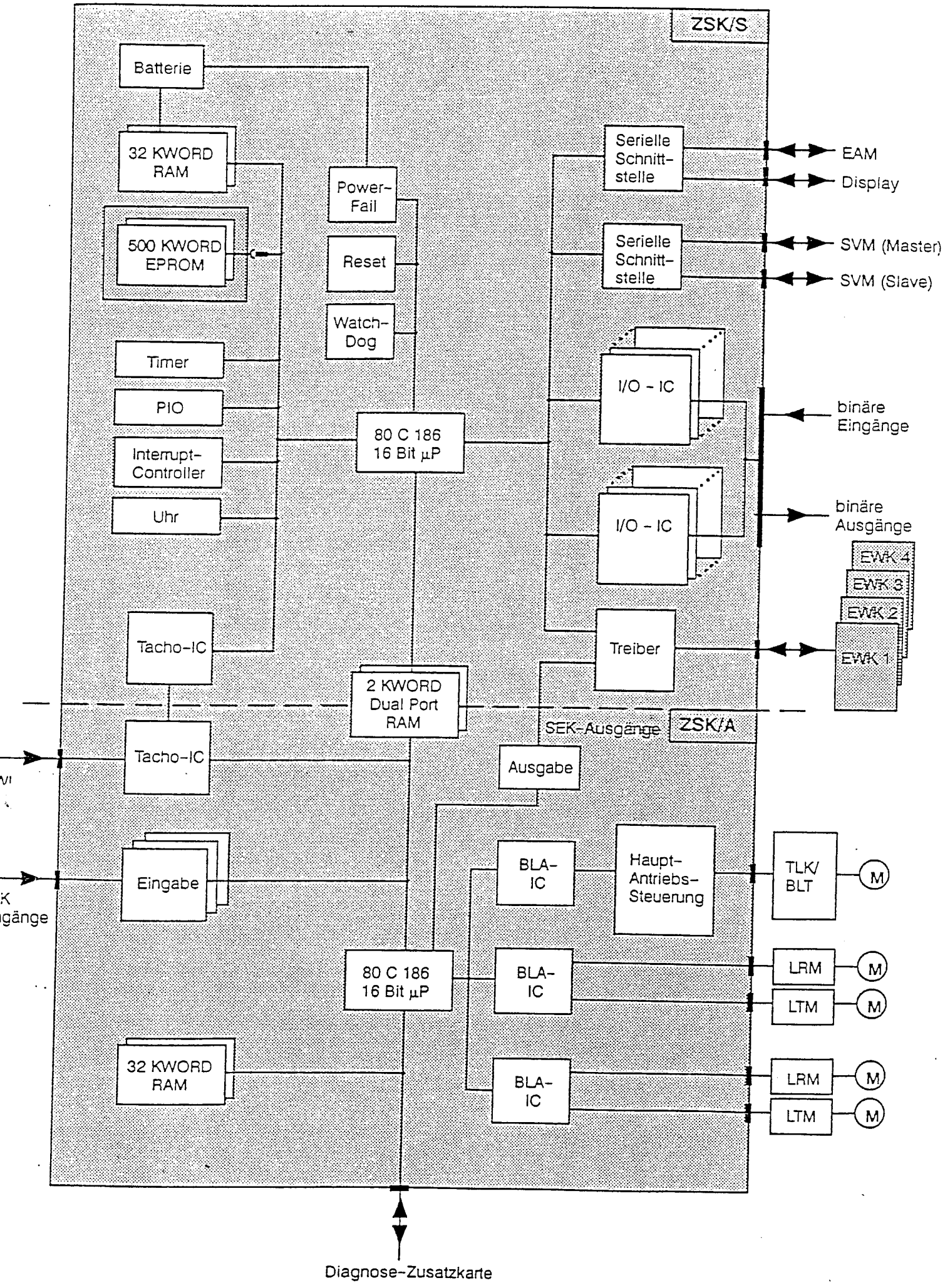


ZSK/A-Hauptantriebssteuerung



Reset- und Power-Fail-Schaltung für KE

Blockschaltbild ZSK



Steckerbelegung serielle Schnittstelle:

5.1 Master-Stecker X5 (Kanal B)

1	3	5	7	9	11	13	15
MEZG	SDA	-	RDB	-	/OUT0	/OUTB	/OUTA
-	SDB	-	RDA	-	OUT0	OUTB	OUTA
2	4	6	8	10	12	14	16

5.2 Slave-Stecker X6 (Kanal B)

1	3	5	7	9	11	13	15
RDA	-	-	-	-	RSA	SDA	MZGA
RDB	-	-	-	-	RSB	SDB	MZGB
2	4	6	8	10	12	14	16

5.3 Stecker X54 (Kanal A)

1	3	5	7	9	11	13	15
-	SDA	-	RDB	CSA	RSA	-	-
-	SDB	-	RDA	CSB	RSB	-	-
2	4	6	8	10	12	14	16

a) Geregelter Antrieb

Pin	Signal	Funktion
X24 /1		
/2	CL2C	
/3	TR1C	
/4	TR2C	
/5	TR3C	
/6	TR4C	
/7	TR5C	
/8	TR6C	
/9	PWM–IC	
/10	FRG–IC	
/11	BRC	
/12	WUC	
/13	SHC	
/14	PGKB	
/15	RES–A0C	
/16	RES–A1C	
/17	/FW–C	
/18	/FM–IC	
/19	Tacho AC	
/20	RES–A2C	
/21	HALL AC	
/22	RES–A3C	
/23	HALL BC	
/24		
/25	HALL CC	
/26		
/27	CLC	
/28	/TF1C	
/29	CM2C	
/30	CMC	
/31	FGC	
/32	Tacho BC	

b) Selbstregelnder Antrieb

Pin	Signal	Funktion
X26 /1		
/2	FRG–NC	
/3	DR–NC	
/4	SSC	
/5	PWM–NC	
/6		

a) Geregelter Antrieb

Pin	Signal	Funktion
X23 /1		
/2	CL2B	
/3	TR1B	
/4	TR2B	
/5	TR3B	
/6	TR4B	
/7	TR5B	
/8	TR6B	
/9	PWM–IB	
/10	FRG–IB	
/11	BRB	
/12	WUB	
/13	SHB	
/14	PGKB	
/15	RES–A0B	
/16	RES–A1B	
/17	/FW–B	
/18	/FM–IB	
/19	Tacho AB	
/20	RES–A2B	
/21	HALL AB	
/22	RES–A3B	
/23	HALL BB	
/24		
/25	HALL LB	
/26		
/27	CLB	
/28	/TF1B	
/29	CM2B	
/30	CMB	
/31	FGB	
/32	Tacho BB	

b) Selbstregelnder Antrieb

Pin	Signal	Funktion
X25 /1		
/2	FRG–NB	
/3	DR–NB	
/4	SSB	
/5	PWM–NB	
/6		

	Pin	Signal	Funktion
RS 422 zu DGP	X4 /1	%	
	/2	%	
	/3	SD1A	Transmit Data
	/4	SD1B	Transmit Data
	/5	%	
	/6	%	
	/7	RD1B	Receive Data
	/8	RD1A	Receive Data
	/9	CS1A	Clear to send
	/10	CS1B	Clear to send
	/11	RS1A	Request to send
	/12	RS1B	Request to send
	/13	%	
	/14	%	
	/15	%	
	/16	%	
RS 422 zu EAM	X18 /1	RES2A	Resetsignal für EAM
	/2	RES2B	Resetsignal für EAM
	/3	RD2A	Receive Data
	/4	RD2B	Receive Data
	/5	BTA	Blinktakt für EAM
	/6	BTB	Blinktakt für EAM
	/7	SD2B	Transmit Data
	/8	SD2A	Transmit Data
	/9	RS2A	Request to send
	/10	RS2B	Request to send
	/11	%	
	/12	%	
	/13	%	
	/14	%	

	Pin	Signal	Funktion
Externen Geräten Master zu SVM	X5 /1	/MZG	MZG–Signal
	/2	%	
	/3	SD3A	Transmit Data
	/4	SD3A	Transmit Data
	/5	%	
	/6	%	
	/7	RD3B	Receive Data
	/8	RD3A	Receive Data
	/9	%	
	/10	%	
	/11	/OUT0	Ø–Impuls HWI
	/12	OUT0	Ø–Impuls HWI
	/13	/OUTB	Spur B HWI
	/14	OUTB	Spur B HWI
	/15	/OUTA	Spur A HWI
	/16	OUTA	Spur A HWI
RS 422 Slave Reserve	X6 /1	RD4A	Receive Data
	/2	RD4B	Receive Data
	/3	%	
	/4	%	
	/5	%	
	/6	%	
	/7	%	
	/8	%	
	/9	%	
	/10	%	
	/11	RS4A	Request to send
	/12	RS4B	Request to send
	/13	SD4A	Transmit Data
	/14	SD4B	Transmit Data
	/15	MZGA	MZG–Signal
	/16	MZGB	MZG–Signal

Steckerbelegung SEK – Eingangsignale

Pin	Signal	Funktion
X27 /1	SEK 1	
/2	SEK 2	
/3	SEK 2	
/4	SEK 2	
/5	SEK 3	
/6	SEK 3	
/7	SEK 3	
/8	SEK 4	
/9	SEK 4	
/10	SEK 4	
X28 /1	SEK 5	
/2	SEK 6	
/3	SEK 6	
/4	SEK 7	
/5	SEK 8	
/6		
/7		
/8		
/9	SEK 2	
/10		

Pin	Signal	Funktion
X29 /1		
/2		
/3		
/4		
/5		
/6	SEK 3	
/7		
/8	SEK 17	
/9	SEK 26	
/10	SEK 32	
X30 /1	SEK 18	
/2	SEK 19	
/3	SEK 20	
/4	SEK 21	
/5	SEK 22	
/6	SEK 23	
/7	SEK 24	
/8	SEK 25	
/9	SEK 31	
/10	SEK 4	

Steckerbelegung Ein– Ausgänge

Pin	Signal	Funktion
X13/1	Diff 1+	
/2	Diff 1–	
/3	AE 01 0	
/4	AE 01 1	
/5	AE 01 2	
/6	AE 01 3	
/7	AE 01 4	
/8	AE 01 5	
/9	AE 01 6	
/10	AE 01 7	
/11	AE 02 0	
/12	AE 02 1	
/13	AE 02 2	
/14	AE 02 3	
/15	AE 02 4	
/16	AE 02 5	
/17	AE 02 6	
/18	AE 02 7	
/19	AE 03 0	
/20	AE 03 1	
/21	AE 03 2	
/22	AE 03 3	
/23	AE 03 4	
/24	AE 03 5	
/25	AE 03 6	
/26	AE 03 7	
/27	AE 04 0	
/28	AE 04 1	
/29	AE 04 2	
/30	AE 04 3	
/31	AE 04 4	
/32	AE 04 5	
/33	AE 04 6	
/34	AE 04 7	

Pin	Signal	Funktion
X14/1	Diff 2+	
/2	Diff 2–	
/3	AE 05 0	
/4	AE 05 1	
/5	AE 05 2	
/6	AE 05 3	
/7	AE 05 4	
/8	AE 01 5	
/9	AE 05 6	
/10	AE 05 7	
/11	AE 06 0	
/12	AE 06 1	
/13	AE 06 2	
/14	AE 06 3	
/15	AE 06 4	
/16	AE 06 5	
/17	AE 06 6	
/18	AE 06 7	
/19	AE 07 0	
/20	AE 07 1	
/21	AE 07 2	
/22	AE 07 3	
/23	AE 07 4	
/24	AE 07 5	
/25	AE 07 6	
/26	AE 07 7	
/27	AE 08 0	
/28	AE 08 1	
/29	AE 08 2	
/30	AE 08 3	
/31	AE 08 4	
/32	AE 08 5	
/33	AE 08 6	
/34	AE 08 7	

X15/1	Diff 3+	
/2	Diff 3–	
/3	AE 09 0	
/4	AE 09 1	
/5	AE 09 2	
/6	AE 09 3	
/7	AE 09 4	
/8	AE 09 5	
/9	AE 09 6	
/10	AE 09 7	
/11	AE 10 0	
/12	AE 10 1	
/13	AE 10 2	
/14	AE 10 3	
/15	AE 10 4	
/16	AE 10 5	
/17	AE 10 6	
/18	AE 10 7	
/19	AE 11 0	
/20	AE 11 1	
/21	AE 11 2	
/22	AE 11 3	
/23	AE 11 4	
/24	AE 11 5	
/25	AE 11 6	
/26	AE 11 7	
/27	AE 12 0	
/28	AE 12 1	
/29	AE 12 2	
/30	AE 12 3	
/31	AE 12 4	
/32	AE 12 5	
/33	AE 12 6	
/34	AE 12 7	

X16/1	Diff 4+	
/2	Diff 4–	
/3	AE 13 0	
/4	AE 13 1	
/5	AE 13 2	
/6	AE 13 3	
/7	AE 13 4	
/8	AE 13 5	
/9	AE 13 6	
/10	AE 13 7	
/11	AE 14 0	
/12	AE 14 1	
/13	AE 14 2	
/14	AE 14 3	
/15	AE 14 4	
/16	AE 14 5	
/17	AE 14 6	
/18	AE 14 7	
/19	AE 15 0	
/20	AE 15 1	
/21	AE 15 2	
/22	AE 15 3	
/23	AE 15 4	
/24	AE 15 5	
/25	AE 15 6	
/26	AE 15 7	
/27	AE 16 0	
/28	AE 16 1	
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/31	AE 16 4	
/32	AE 16 5	
/33	AE 16 6	
/34	AE 16 7	

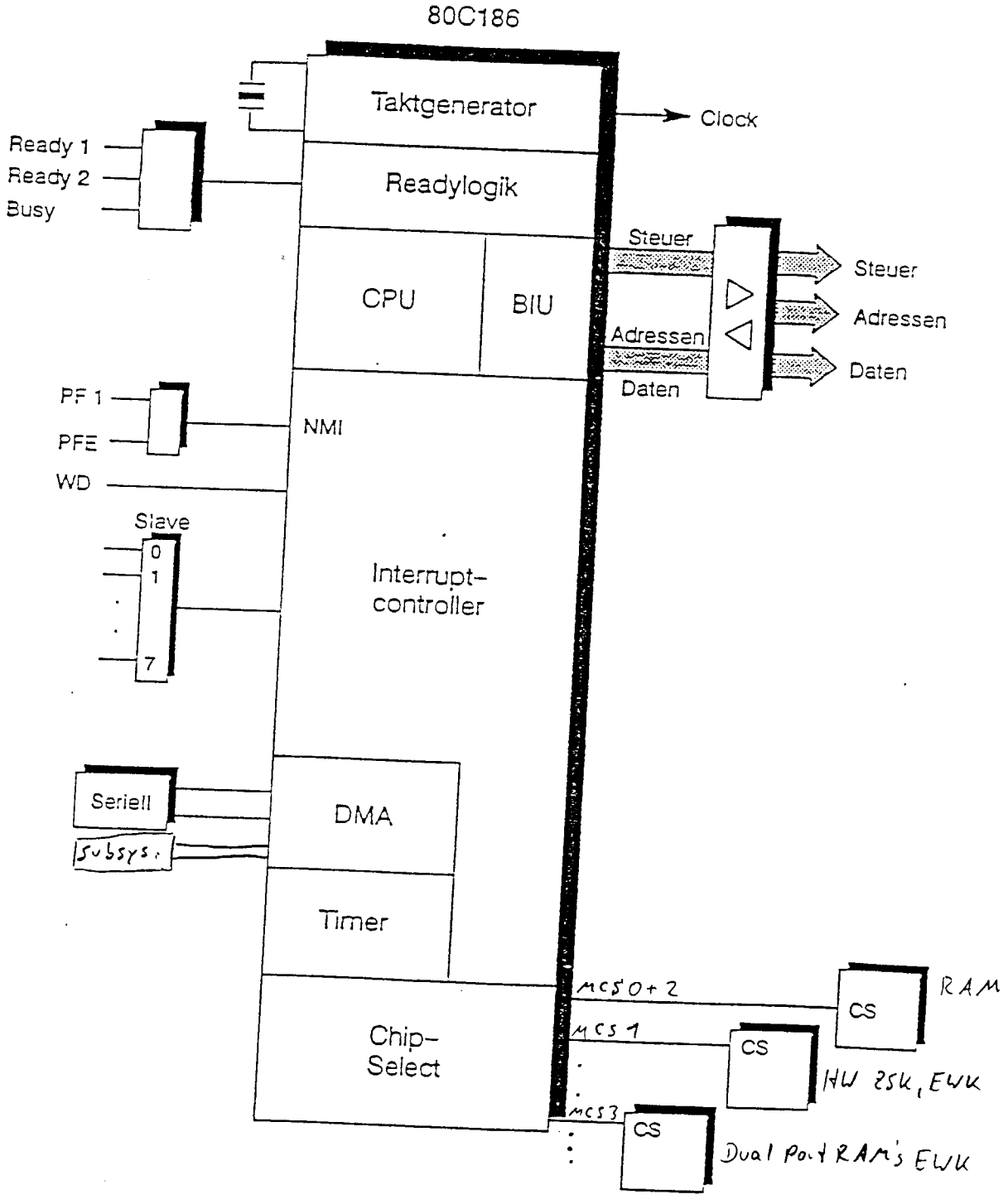


Bild 4.2.1: Blockschaltbild des Mikroprozessor 80C186

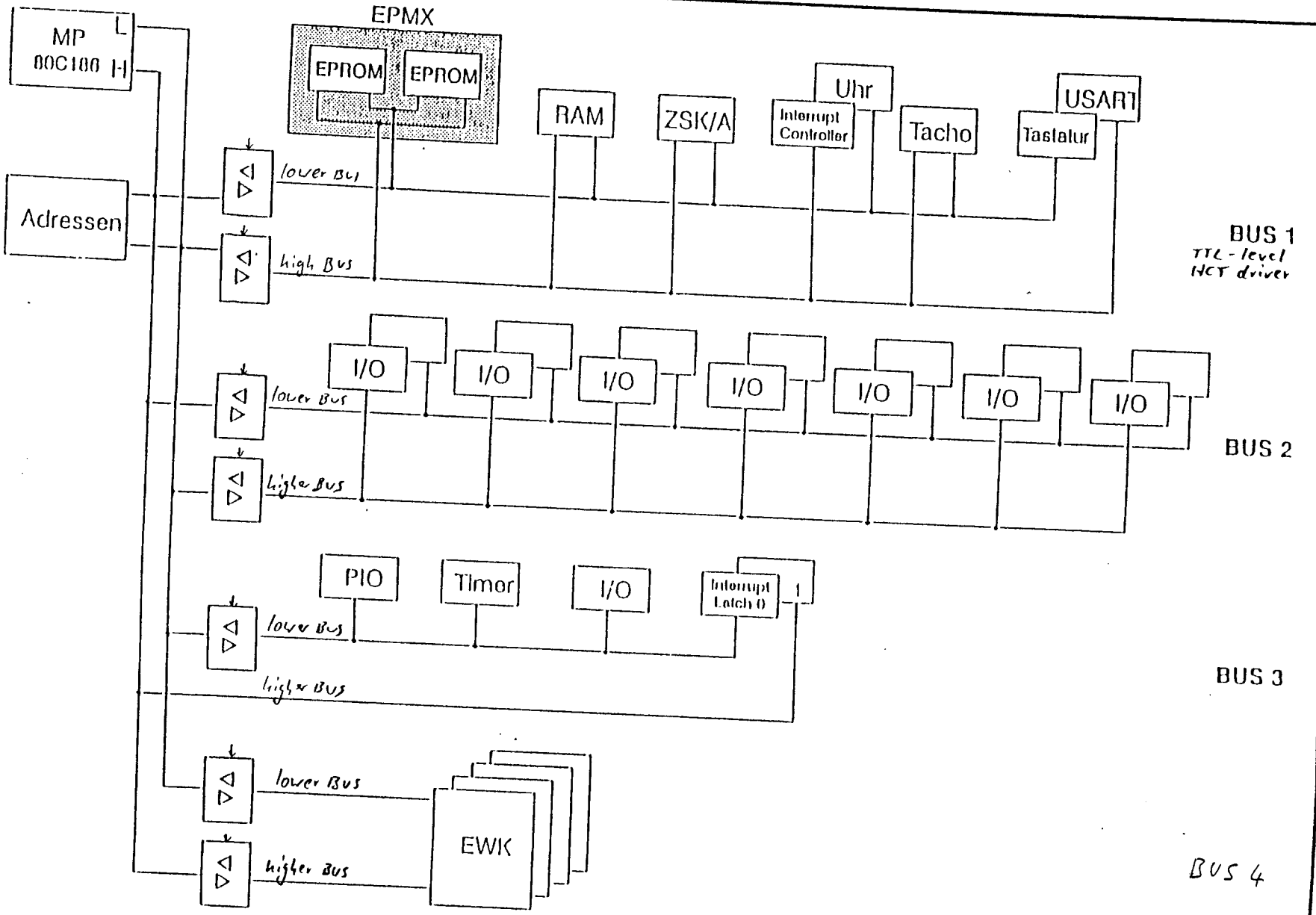


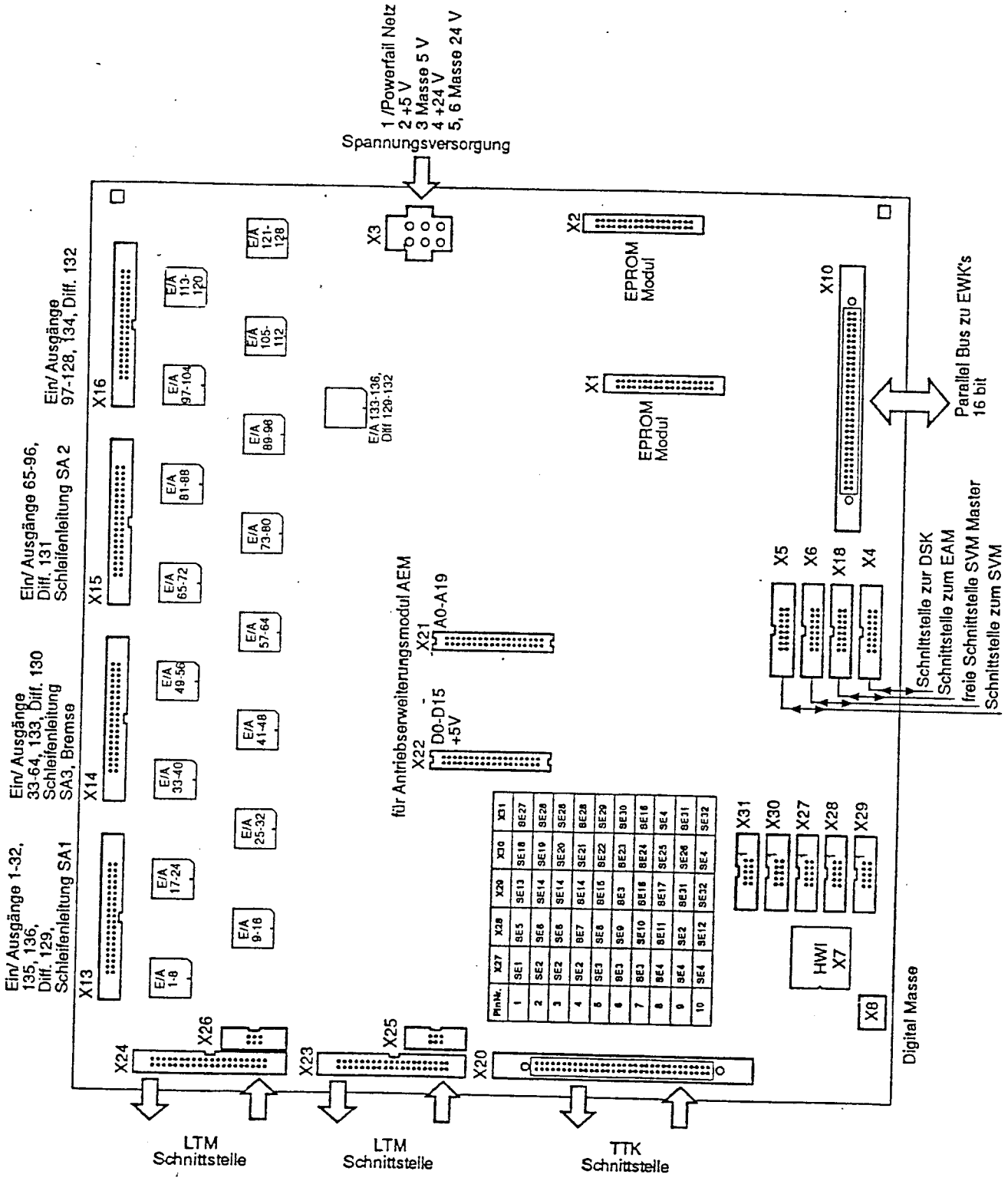
Bild 4.2.4.1: Datenbusaufteilung

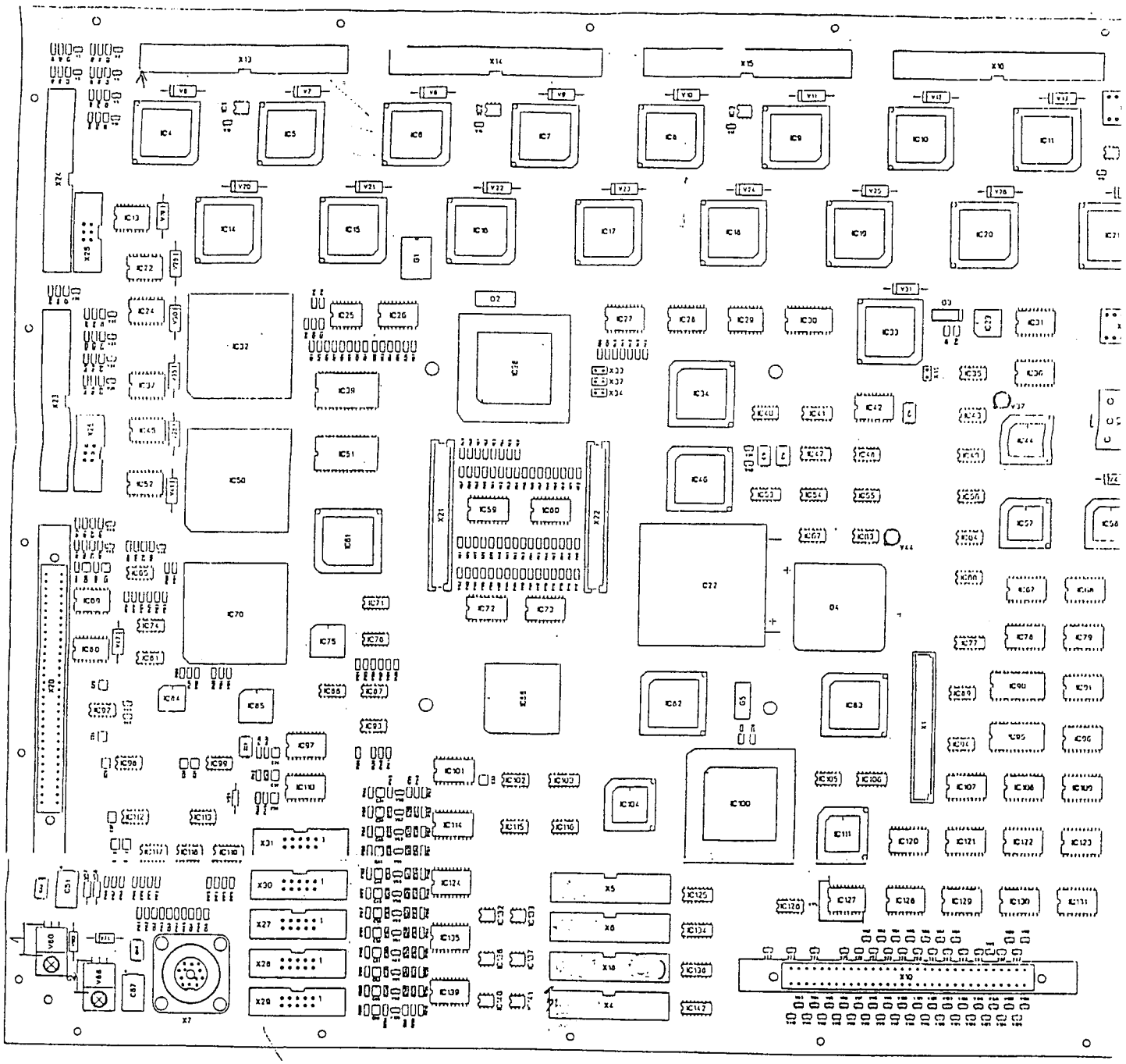
Gez.
Sachb.
Gen.
Ausgabe

Heidelberger Druckmaschinen Aktiengesellschaft

Dokumentation "ZSK/S"
vorläufig

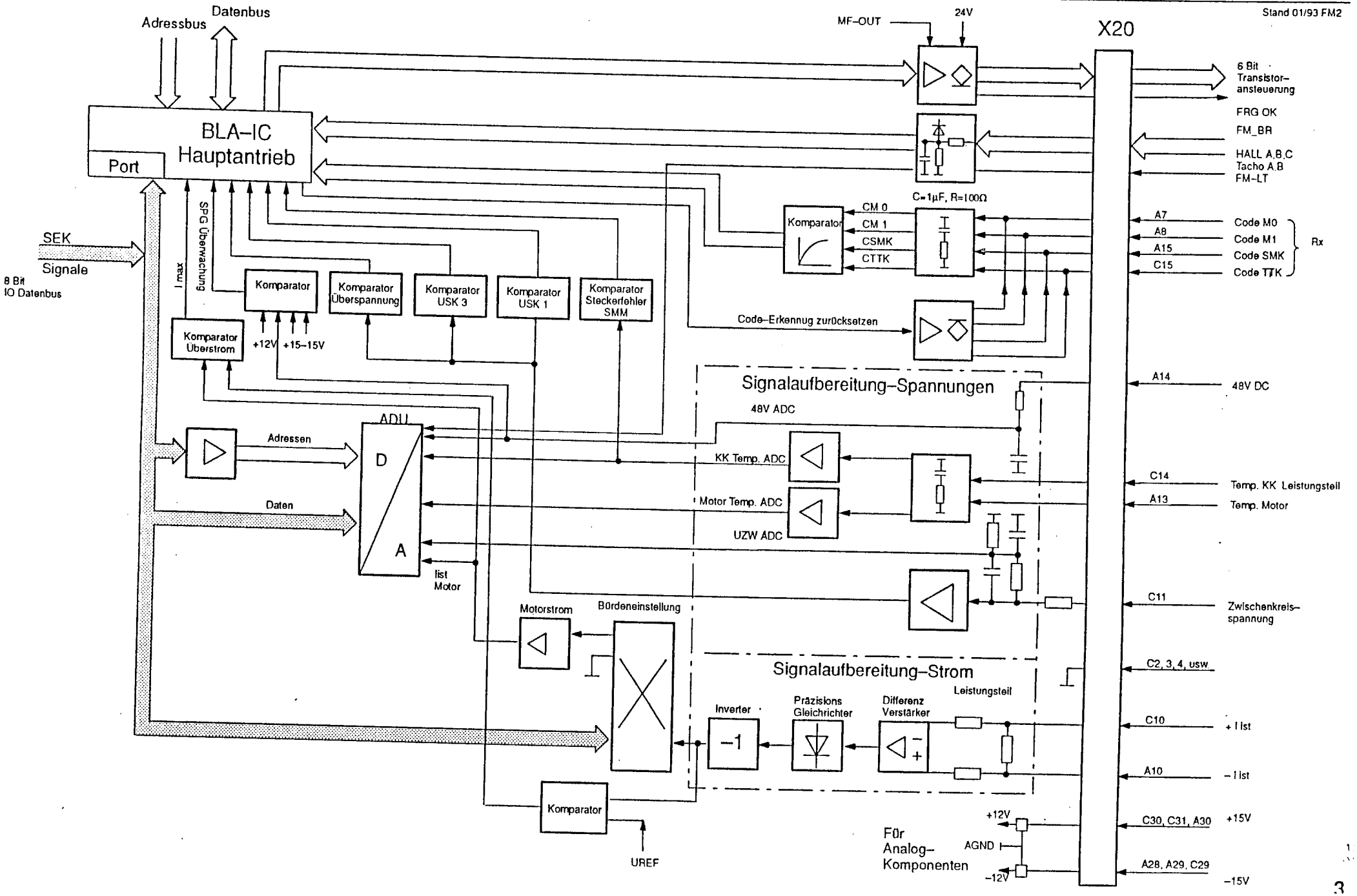
Steckerbelegung ZSK



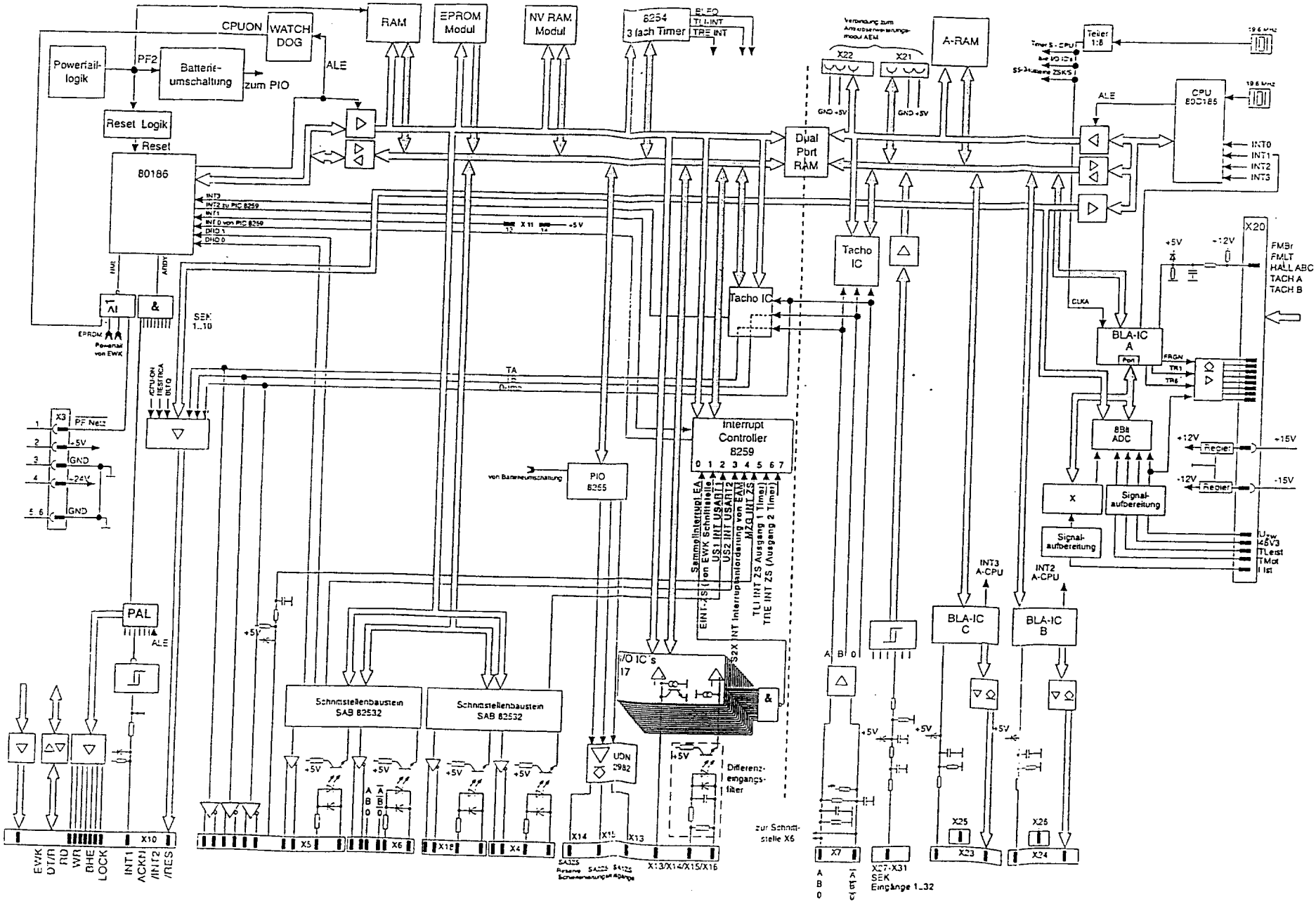


Blockschaltbild ZSK
Antriebsteil Hauptantriebssteuerung

HEIDELBERG

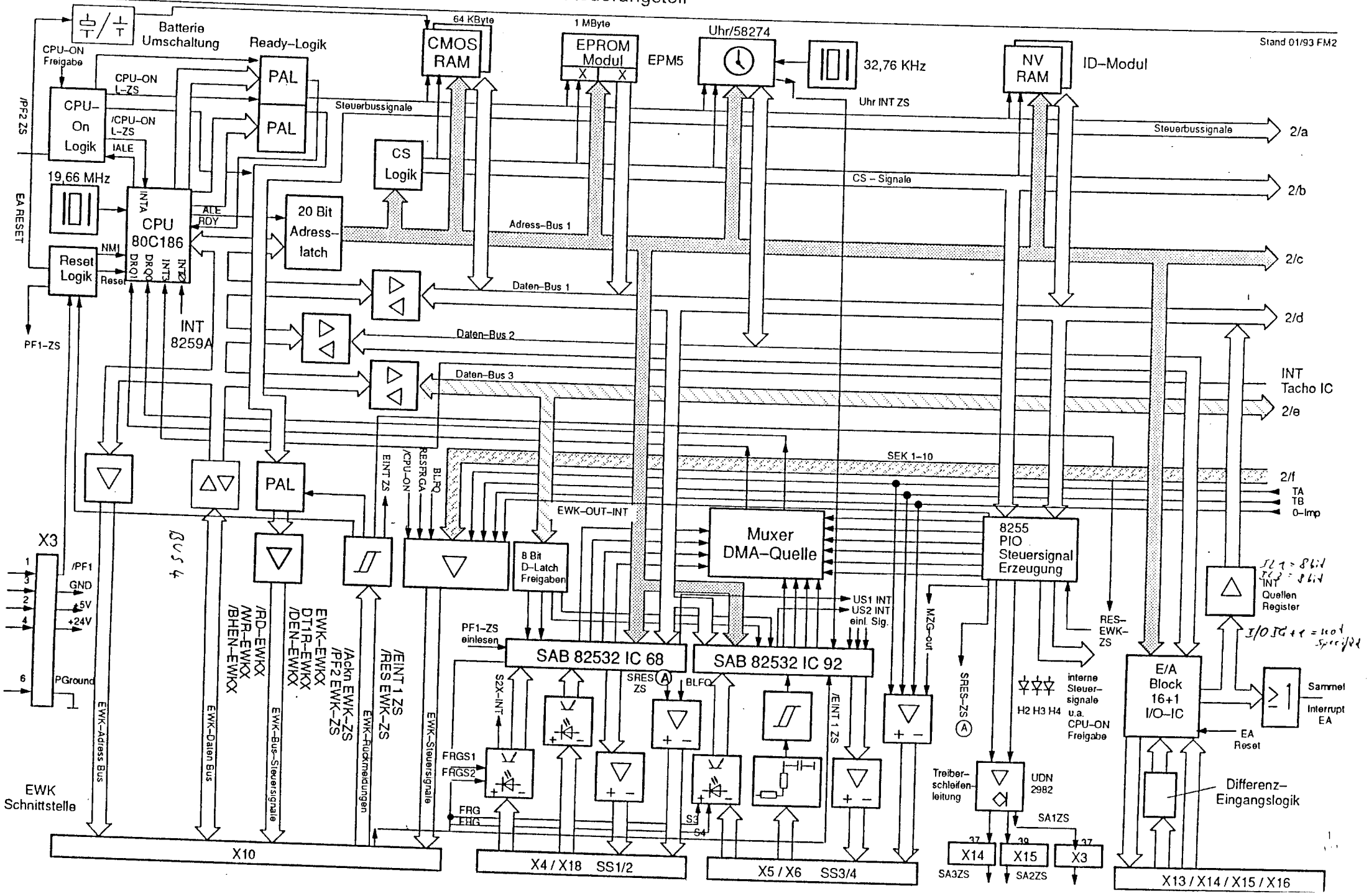


Blockschaltbild ZSK

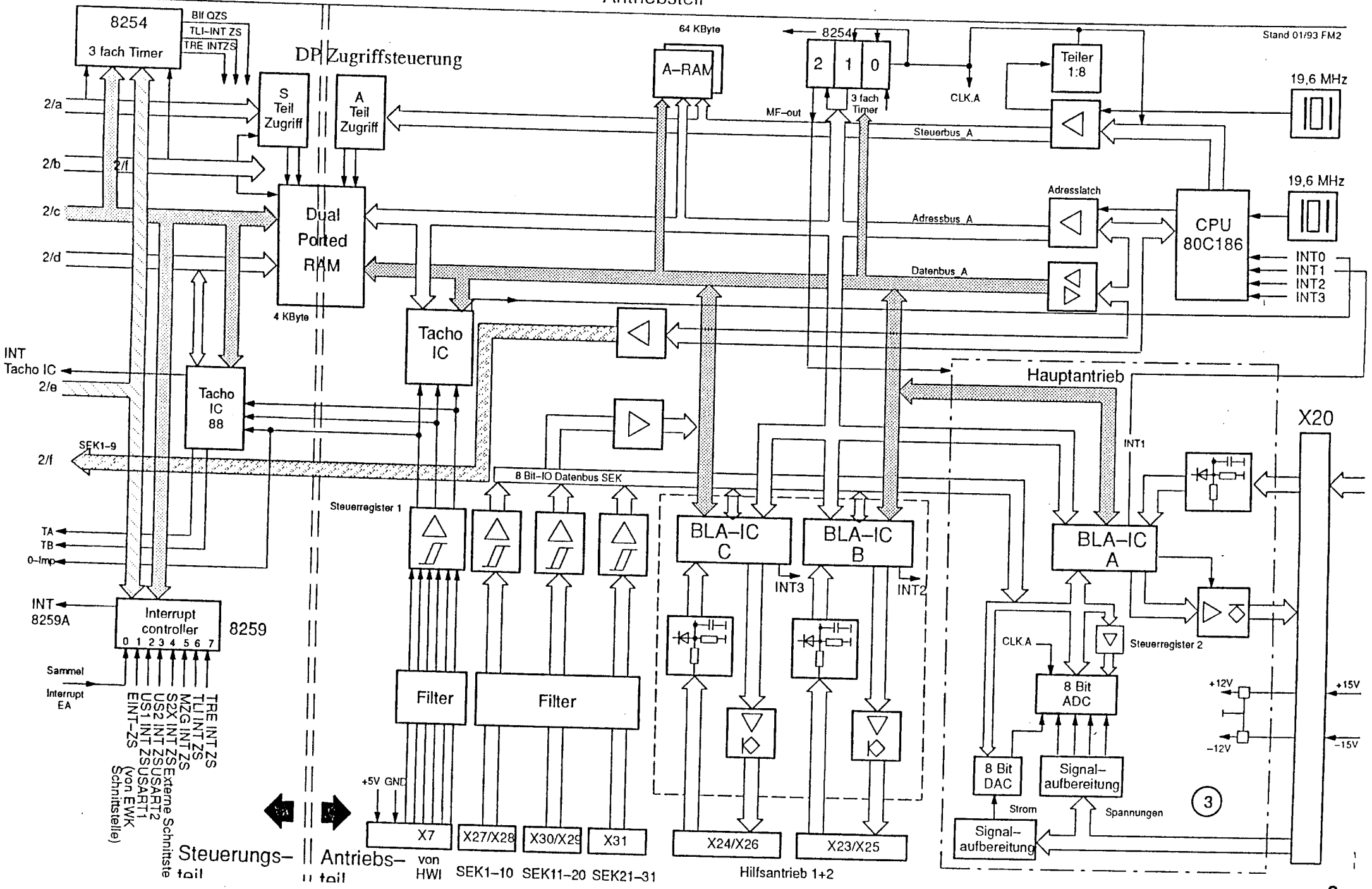


Blockschaltbild ZSK
Steuerungsteil

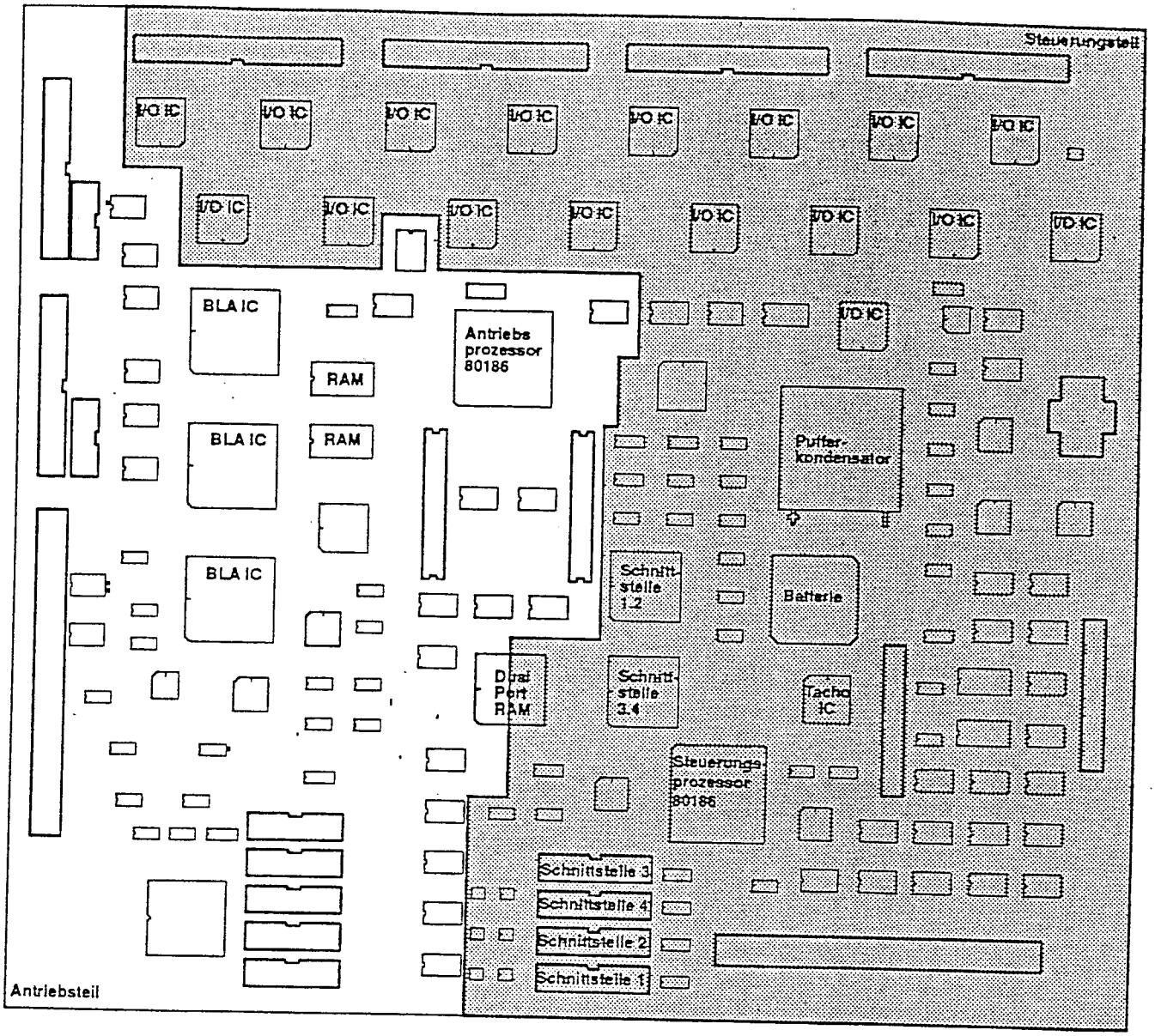
HEIDELBERG



Blockschaltbild ZSK Antriebsteil

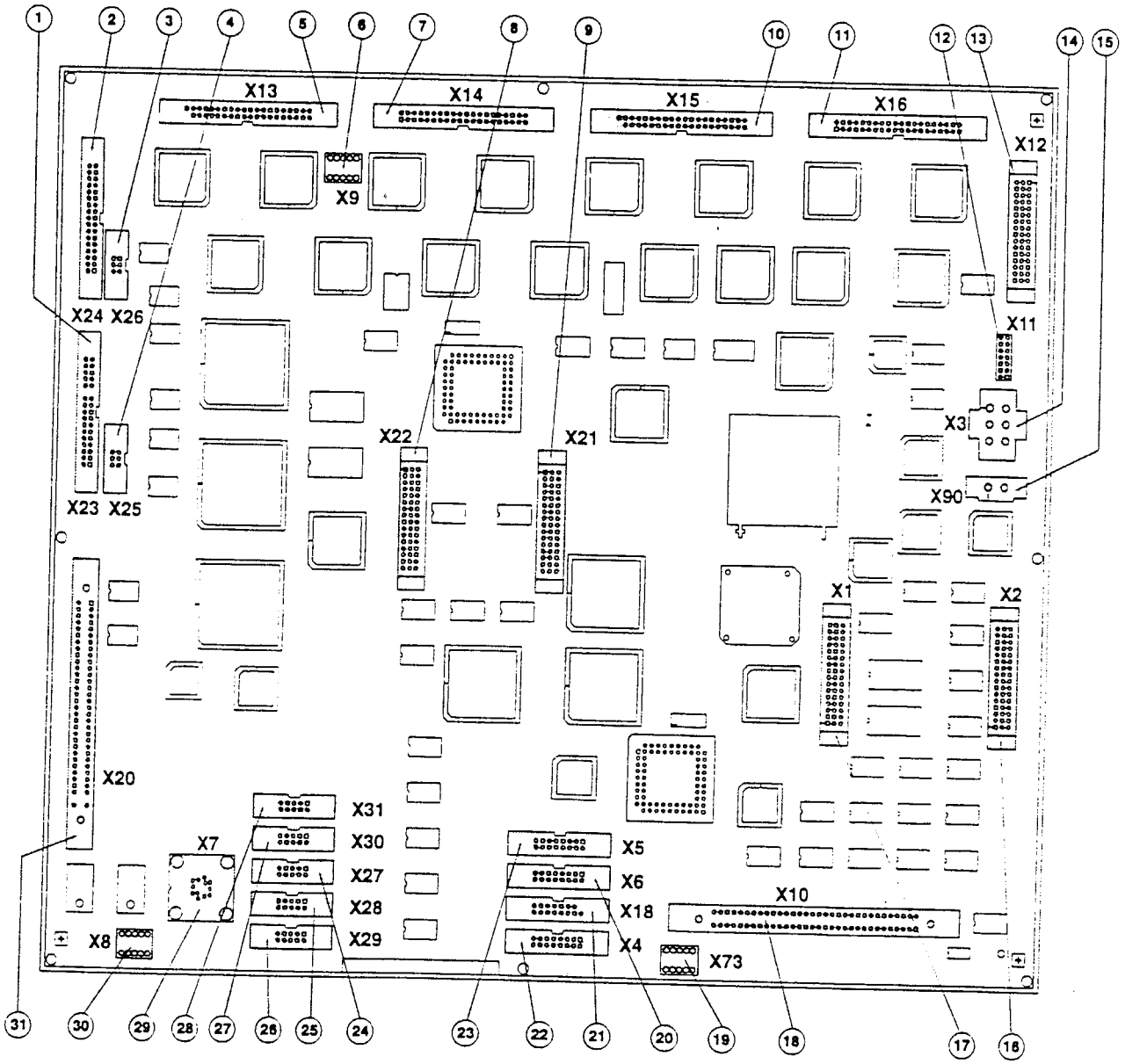


Steuerungs- und Antriebsteil ZSK



ZSK Central control board

Layout



Central control board ZSK

① X23 Male connector auxiliary drives (LTM/STM) [1]
② X24 Male connector auxiliary drives (LTM/STM) [1]
③ X26 male connector self–regulating auxiliary drives (SLM) [1]
④ X25 Male connector self–regulating auxiliary drives (SLM) [1]
⑤ X13 Male connector
- digital inputs/outputs 1 ... 32 (EVM)
- CPC 31 distributor board CVK [1]

⑥ X9 Screw terminal ⊥ 24V
⑦ X14 Male connector / inputs/outputs 33 ... 64 (EVM)
⑧ X22 Female connector Drive extension module AEM [1]
⑨ X21 Female connector Drive extension module AEM [1]
⑩ X15 Male connector digital inputs/outputs 65 ... 96 (EVM)
⑪ X16 Male connector digital inputs/outputs 97 ... 128 (EVM)
⑫ X11 Male connector
⑬ X12 Male connector NV-RAM-module [1]
⑭ X3 Male connector power supply unit ZSK
⑮ X90 Male connector power supply unit ZSK
⑯ X2 Male connector / EPROM module EPM
⑰ X1 Male connector EPROM-module EPM
⑱ X10 Male connector parallel bus EWK/PEK [1]
⑲ X73 Screw–type terminal ⊥ 5V
⑳ X6 Male connector serial interface (SVM) [1]
㉑ X18 Male connector serial interface (EAM)
㉒ X4 Male connector serial interface [1]
㉓ X5 Male connector serial interface (SVM) [1]
㉔ X27 Male connector / safety inputs (EVM)
㉕ X28 Male connector / safety inputs (EVM)
㉖ X29 Male connector / safety inputs (EVM)
㉗ X30 Male connector safety inputs (EVM)
㉘ X31 Male connector safety inputs (EVM)
㉙ X7 Female connector incremental encoder system IDS (press tachometer)
㉚ X8 Screw–type terminal ⊥ 5V
㉛ X20 Male connector main drive (BLT, TLK) [1]

[1] Application–dependent

Pin Assignments CPtronic-Compact RSC-Bangkok, Futterlieb

EWK X1 / ZSK X10

n.c.=not connected
---/ = low active
--- = high active

----A01 = Adr00 enable databus on EWK
----A02 = Adr01 A17 = D00
----A03 = Adr02 A18 = D01
----A04 = Adr03 A19 = D02
----A05 = Adr04 A20 = D03
----A06 = Adr05 A21 = D04
----A07 = Adr06 A22 = D05
----A08 = Adr07 A23 = D06
----A09 = Adr08 A24 = D07
----A10 = Adr09 A25 = D08
----A11 = Adr10 A26 = D09
----A12 = Adr11 A27 = D10
----A13 = Adr12 A28 = D11
----A14 = Adr13 A29 = D12
----A15 = Adr14 A30 = D13
----A16 = Adr15 A31 = D14
----C01 = /RD read, pulses A32 = D15
----C02 = /WR write, pulses
----C03 = DT/R enable data-latches on EWK, pulses buffer direction control signals
----C04 = /DEN data enable, high o.k. 25_INT_EWK
----C05 = ALE adress-latch-enable, pulses
----C06 = /BHEN bus high enable(D8-D15),pulses
----C07 = /EWKEN adress,controlbus-enable for EWK,pulses activ low, when EWK is accessed
----C08 = /LOCK, high o.k.
----C09 = SEK01 double safety output main pile feeder up, low o.k.
----C10 = SEK02 " main pile feeder down, low o.k.
----C11 = SEK03 " auxiliary pile feeder up, low o.k.
----C12 = SEK04 " auxiliary pile feeder down, low o.k.
----C13 = SEK05 " main pile delivery up, low o.k.
----C14 = SEK06 " main pile delivery down, low o.k.
----C15 = SEK07 "
----C16 = SEK08 "
----C17 = SEK09 " stop of all pile drives, low o.k.
----C18 = TACH0 encoder track 0
----C19 = TACHA encoder track A
----C20 = TACHB encoder track B
----C21 = BLFQ blink-freqency(10HZ), pulses
----C22 = SEK10 double safety output servo drives, low o.k. reset for EWK-E
----C23 = /CPU_ON_ZS reset for EWKx from ZSK and error routine(data save), low o.k.
----C24 = n.c.
----C25 = /INT[EINTZS] interrupt from EWKxI/O-section, high, any INT from I/O low pulse INT_1
----C26 = /ACKN from EWKx acknowledge of successful access, pulses
----C27 = /PFI2x powerfail on EWKx(INT2 EWKx), high o.k. INT_2
----C28 = /RESx reset of EWKx caused of PFI1 or CPU_ON EWK, high o.k.
----C29 to C32 = n.c.

☞Testpins / X11 on ZSK
----1&2 = systemreset to µpc ZSK/S
----5&6 = watchdog-function off, reset-off for I/O chips
----7&8 = reset to EWK(SAB82532 reset)
----9&10 = ur-init for KID of SM52(8255 P07, SAB82532 Pin 64)
----11&12 = ur-init software-version 103 and higher
----13&14 = not used(no interrupt-rutine assigned)

☞Testpins / X3
----1&2 = /RES reset for ZSK

☞Testpins / X4
----1&2 = /PFI2 powerfail2 from EWK

☞Testpins / X5
----1&2 = /RST power-up reset for EWK(remains until system-reset in reset-status)

☞Testpins / X40,X46,X47
----1,2 = +5VDC

☞Testpins / X40,X41,X42
----1,2 = GND

☞Testpins / X50
----1&2 = activate brake of maindrive

☞Testpins / X51
----1&2 = produce enable signal for BLA-IC

☞AEM Slot X60
----Pin2,4,6,8,10,12,14,16,18 = GND
----Pin20,22,24,26,28,30,32,34,36 = GND
----Pin03 = /D15 Pin19 = /D07
----Pin05 = /D14 Pin21 = /D06
----Pin07 = /D13 Pin23 = /D05
----Pin09 = /D12 Pin25 = /D04
----Pin11 = /D11 Pin27 = /D03
----Pin13 = /D10 Pin29 = /D02
----Pin15 = /D09 Pin31 = /D01
----Pin17 = /D08 Pin33 = /D00

☞AEM Slot X61
----Pin01 = /A19
----Pin02 = /A18
----Pin03 = /A17
----Pin04 = /A16
----Pin05 = /A15
----Pin06 = /DIAG
----Pin07 = /A14
----Pin19 =/A8
----Pin20 = +5V
----Pin21 = /A7
----Pin22 = /RES
----Pin23 = /A6
----Pin24 = /RD
----Pin25 = /A5

----Pin08 = /BUSY_DIAG
----Pin09 = /A13
----Pin10 = GND
----Pin11 = A12
----Pin12 = GND
----Pin13 = A11
----Pin14 = GND
----Pin15 = A10
----Pin16 = +5VDC
----Pin17 = A09
----Pin18 = +5VDC

----Pin26 = /WR
----Pin27 = /A4
----Pin28 = BHE Bus high enable
----Pin29 = /A3
----Pin30 =/INT_VALL
----Pin31 =/A2
----Pin32 =GND
----Pin33 =/A1
----Pin34 =GND
----Pin35 =/A0
----Pin36 =+5V

☞Testpins / X80
----1,2 = GND

☞Testpins / X81
----1,2 = +5VDC

☞Testpins / X82
----1,2 = +24VDC for servodrives

☞Testpins / X83
----1,2 = CPU_ON from ZSK/S(low = cpu off)

☞Testpins / X84
----1,2 = EWK in reset(high = reset)

☞Testpins / X85
----1,2 = on board EWK powerfail(high = powerfail)

☞Testpins / X86
----1,2 = +24VDC

☞Testpins / X87
----1,2 = EWKEN from ZSK, pulsed

☞LED`s EWKx

during INIT h1/gn = on	after INIT h1 = on
h2/rd = on	h2 = flickering, µpc_E run(mainprogr. cycles)
h3/rd = off	h3 = off, µpc_A run
h4/gn =off	h4 = pulsed, µpc_A run(mainprogr. cycles)

☞LED`s ZSK

during INIT h1/rd = off	after INIT h1 = pulsed, µpc_S run
h2/gn = on	h2 = off, INT
h3/gn = on	h3 = off, INT
h4/rd = on	h4 = off, INT

☞**STM, X1** Futterlieb RSC-Bangkok

---Pin28 = /TF, governor foot, high=not operated

Init-test / code check

---Pin10 = /FRG, release powerpart, high

---Pin08 = /DRI, revolve. direction, low pulse (trigger code resistor check)

---Pin30 = CM, code motor, low pulse (pulse - with proportional to res. value)

---Pin27 = CL, code power part low pulse (pulse - with proportional to res. value)

Motor not operated

---Pin17 = /FW, error warning, high

---Pin18 = /FM, error massage, high X2/Pin07 = temp. resist. 30 degree C = 24.16VDC

---Pin10 = /FRG, release powerpart, high

---Pin11 = /BRM, release break, high

Motor start

---Pin10 = /FRG, release powerpart, low

---Pin05 = /ST_ELR, electronic load relays (d.tyristor), low

---Pin11 = /BRM, release break, low

---Pin08 = /DRI, rev. direction, high = up, low = down

---Pin07 = /WU, low speed coil =high high speed coil = low

Motor started

---Pin19 = HKZ1, hall sensor 1

---Pin23 = HKZ2, hall sensor 2, HKZ1&2 pattern change (feedback revolving & direction & pile control)

☞**LTM 100/300**

Init test / code check

---Pin10 = /FLT, release powerpart, high

---Pin08 = TC-, low pulse (trigger code resistor check)

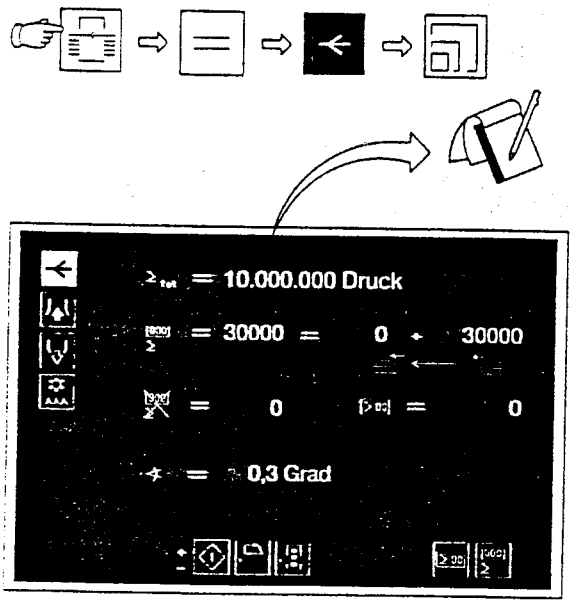
---Pin30 = CM, code resistor motor low pulse (pulse - with proportional to res. value)

---Pin27 = CL, code resistor powerp. low pulse (pulse - with proportional to res. value)

Exchanging the central control board ZSK

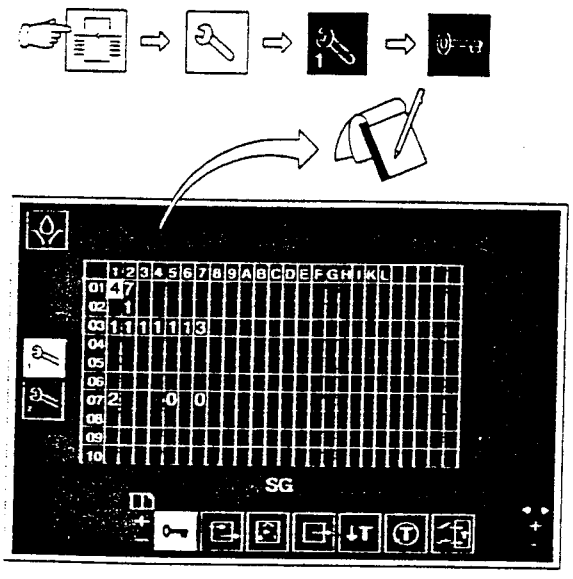
Note:

The points ❶,❷,❼ and ❽ do not apply for plate image reader CPC 31.



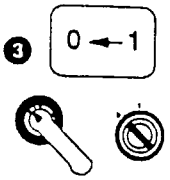
Totalizer reading

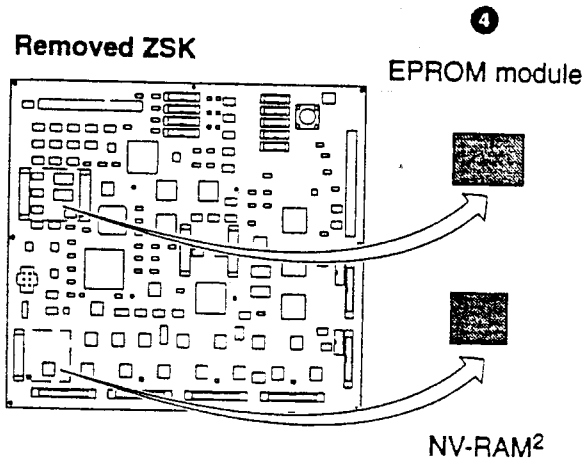
❶ Note down totalizer reading (Σ_{tot}) .



Variant code

❷ Note down variant code (page 1 to 3).

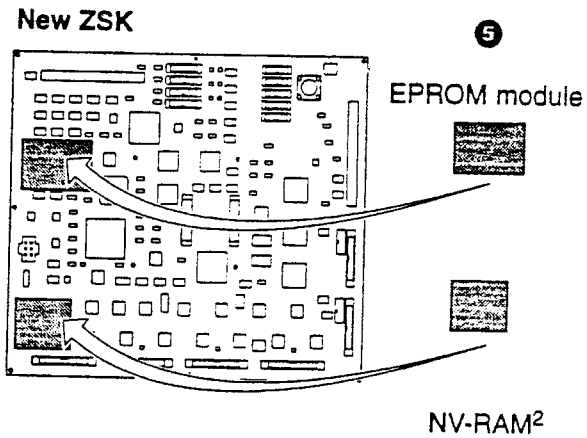


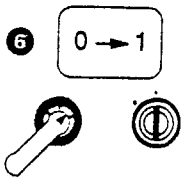


Remove ZSK

❸ Switch off main switch/key switch[1] and remove ZSK.

❹ Withdraw the EPROM module and the NV-RAM[2].





Remove ZSK

❺ Plug in the EPROM module and the NV-RAM[2] on the new ZSK and install the new ZSK.

Bootstrap and

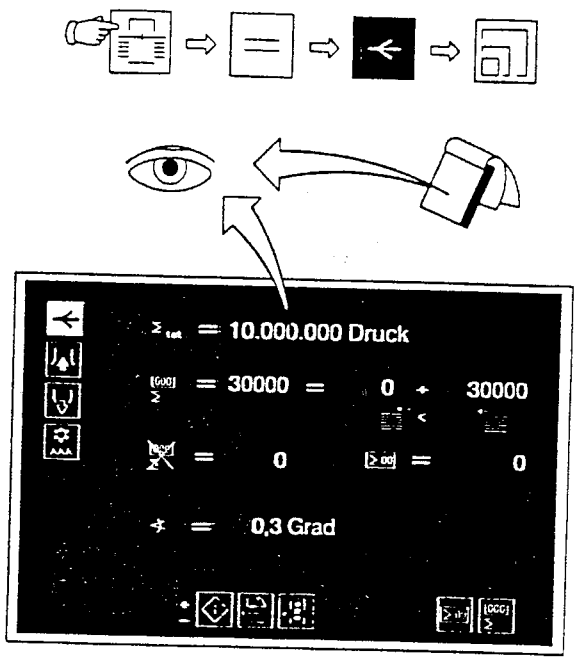
❻ switch on main switch/key switch[1].

Applies only for the ZSK in the plate image reader CPC 31:

After the ZSK has been exchanged, the pulse generator must be set and the flourescent lamps must be calibrated.

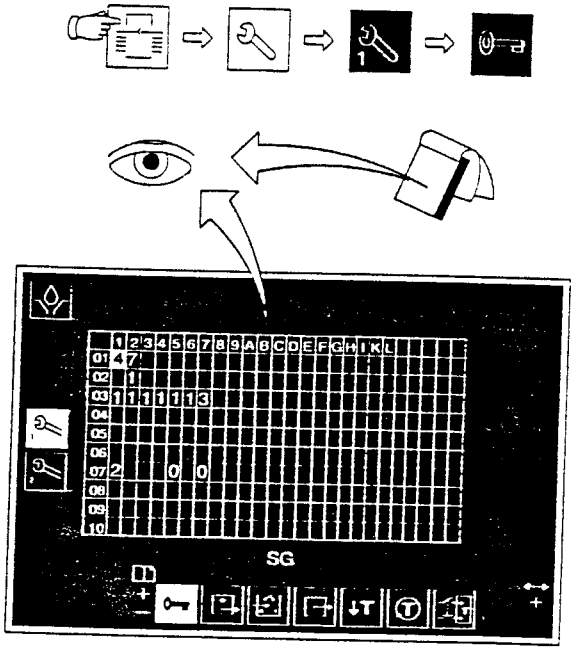
[1] Key switch at CPC 31

[2] No NV-RAM available at ZSK in the CPC 31.



Totalizer reading

❼ Compare totalizer reading with note.



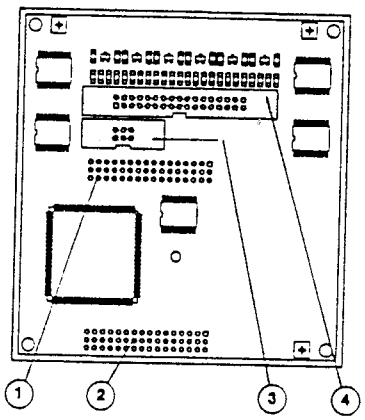
Variant code

❽ Compare variant code with note.

Electronic boards/modules

AEM Drive extension module

Layout



Drive extension module AEM

① X1 Male connector, connection to board slot EWK or ZSK

② X2 Male connector, connection to board slot EWK or ZSK

③ X5 Male connector, self–regulating auxiliary drive

④ X4 Male connector, auxiliary drive

Task/function

The drive extension module AEM is used on the EWK or ZSK to control additional auxiliary drives.

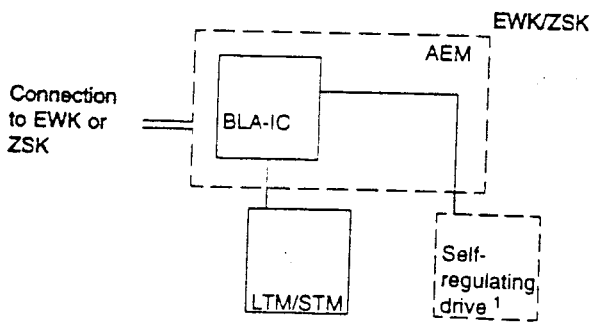
It controls

- a self–regulating auxiliary drive [1],
- an auxiliary drive controlled via the BLA-IC.

All necessary signals for the control of an auxiliary drive are provided from the BLA–IC (see also EWK or ZSK).

Components

Block diagram

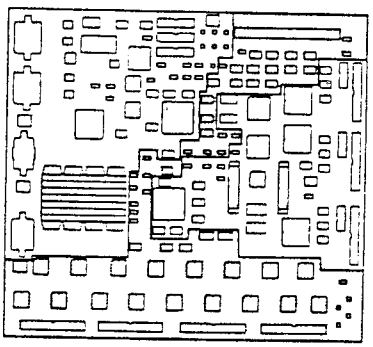


Simplified block diagram of AEM

[1] Application–dependent

Task

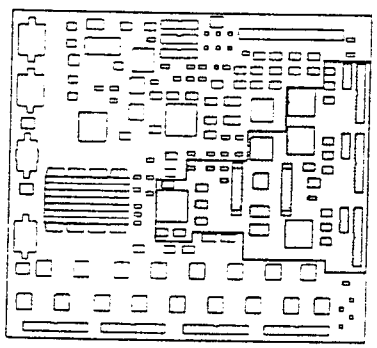
The extension board EWK implements additional control functions and, together with the ZSK, it forms the "computing centre"of the CPTRONIC compact. Depending on the application or press configuration, several EWKs can be used. The EWK is divided into three essential function areas:



Control section EWK-S

Control section EWK-S

In addition to the ZSK, the control section of the EWK registers and controls 128 inputs and outputs and four differential inputs.
The inputs and outputs are organized by the ZSK, because the EWK-S has no processor of its own.

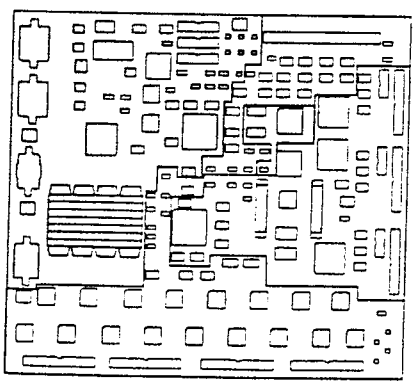


Drive section EWK-A

Drive section EWK-A

The drive section of the EWK controls

- the self–regulating auxiliary drives [1] and
- the auxiliary drives which are regulated by the processor of the EWK-A
- further self–regulating auxiliary drives and auxiliary drives controlled via the EWK by the drive extension module AEM [1].



Servo–drive section EWK-E

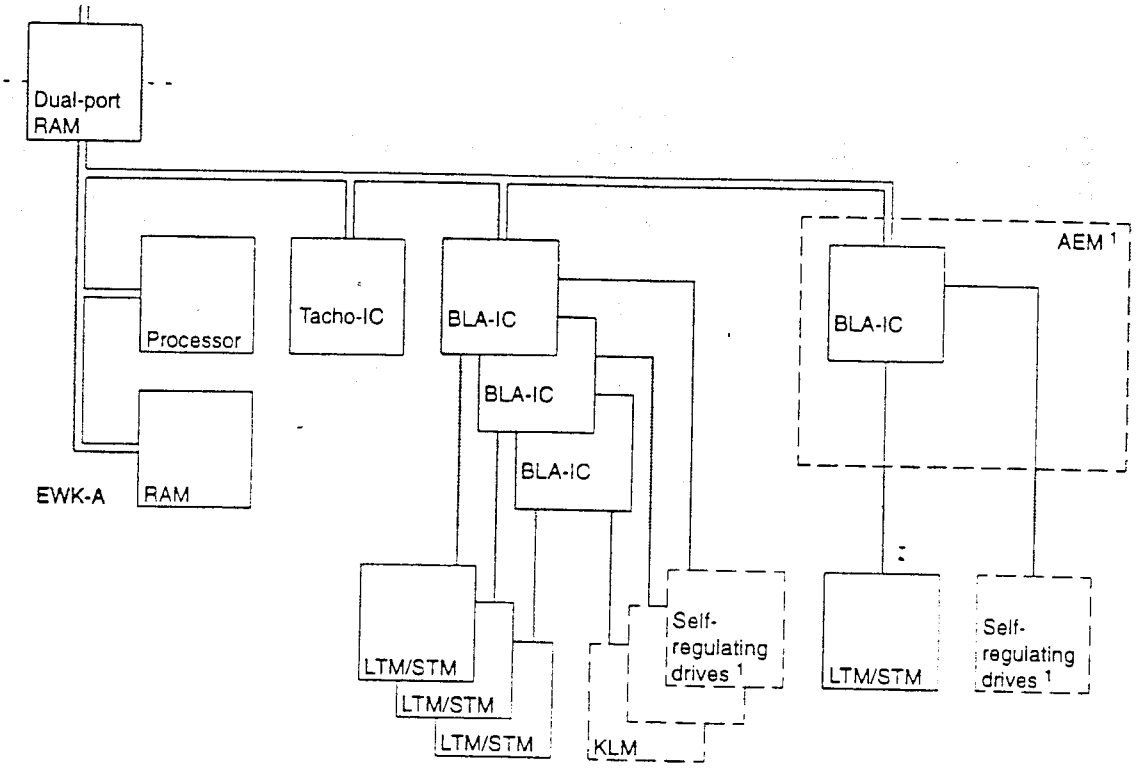
Servo–drive section EWK-E

The servo–drive section of the EWK

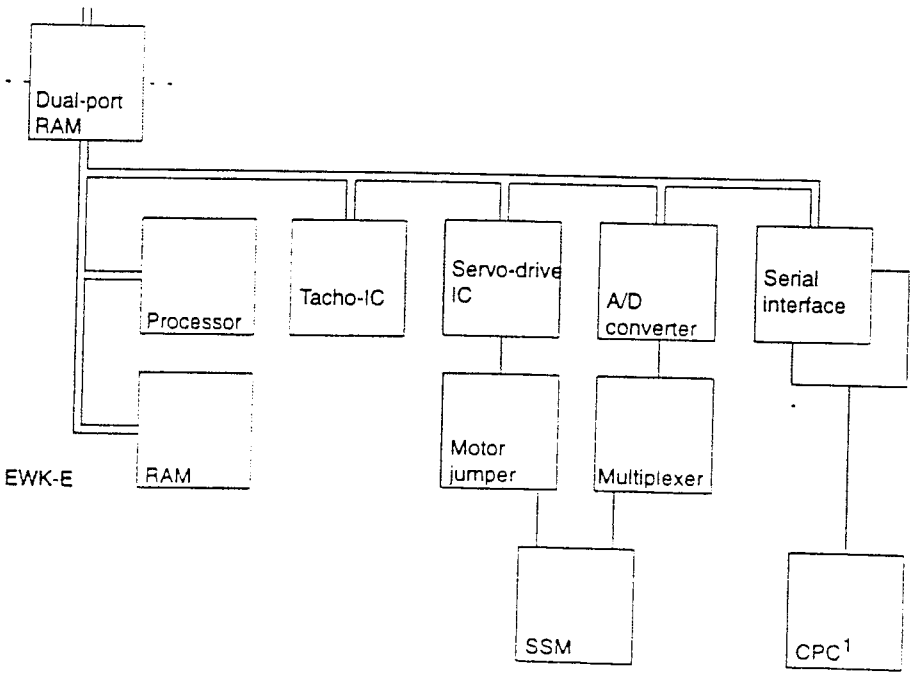
- controls the servo–drives (max. eight) and
- evaluates the analog voltage inputs of the servo–drive potentiometers (max. eight) via an A/D-converter,
- has eight more analog inputs which can be configured as current/voltage inputs,
- serves two serial interfaces [1].

[1] Application–dependent

Block diagram

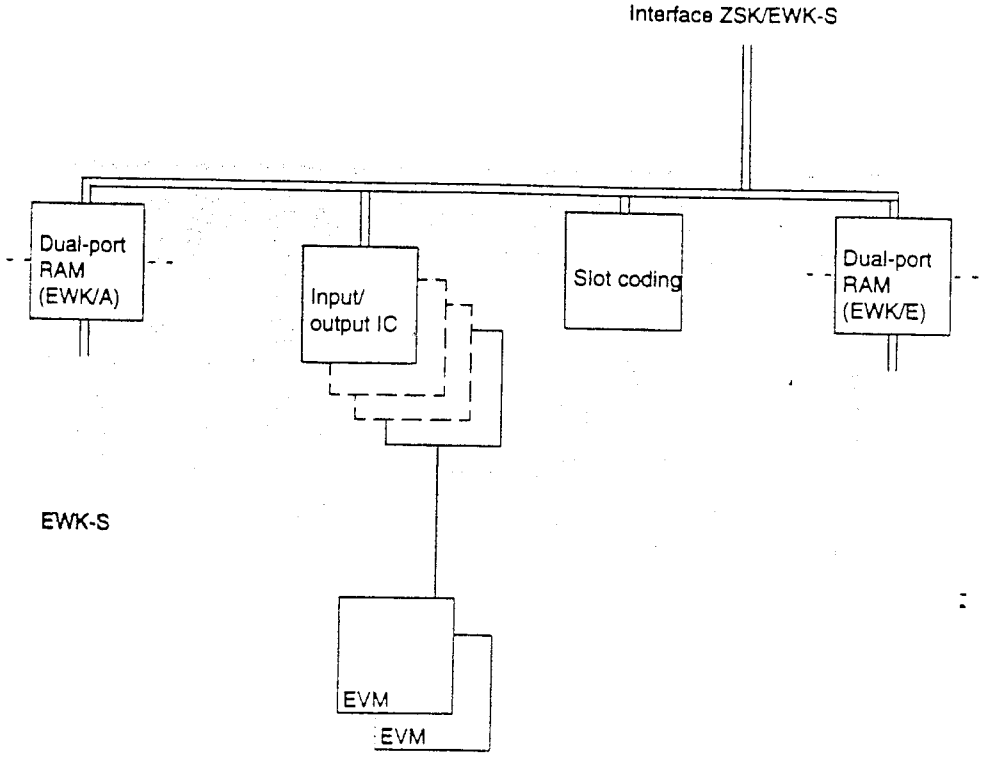


Simplified block diagram of EWK-A



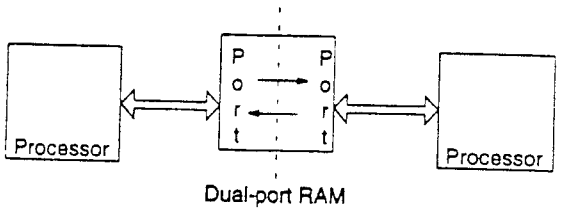
Simplified block diagram of EWK-E

[1] Application–dependent



Simplified block diagram of EWK-S

Function



Schematic representation of dual-port RAM

As far as control is concerned, the three function areas of the EWK are independent:

- the servo–drive section EWK-E and the drive section EWK-A have their own processors,
- the control section EWK-S uses the processor of the ZSK.

The communication and data exchange between these sections is effected via dual-port RAMs.

Dual-port RAM

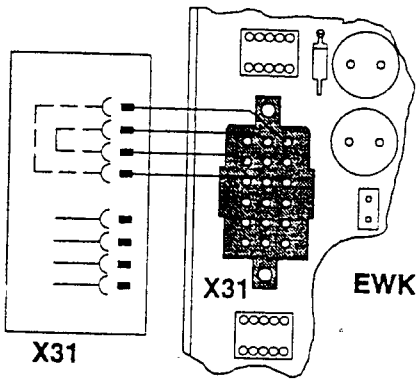
The dual-port-RAM is a memory IC and serves as an interface between the individual function areas. It allows two processors to access the same memory. Both ports can be controlled separately.
Both processors have independent read and write access to this IC. Internal lock–outs ensure consistent information.

"Brushless drive" IC (BLA-IC)

All functions necessary to control a brushless d.c. drive and a self–regulating drive are integrated in the BLA-IC. With its BLA-ICs the EWK (drive section) controls auxiliary drives. The following functions are implemented by the BLA-IC:

- current regulation,
- winding changeover,
- enabling of power part,
- brake activation,
- default for the direction of rotation,
- determination of speed (Hall/tacho signals),
- . . ..

The BLA-IC monitors these functions and generates fault signals for certain malfunctions. The ZSK–A–part takes care of the evaluation of these error signals.



Coding in the set of cables, female connector X31, power supply to male connector EWK-X31

Slot coding of EWK

Depending on the press configuration several EWKs can be used. The ZSK is responsible for the EWKs. Through a coding in the set of cables the ZSK can identify each EWK.
This coding is effected in the connector of the set of cables leading to connector EWK-X31:

Board no.	Jumper from	to	Level
1. EWK:	X31:13	X31:17	⊥
	X31:14	X31:18	⊥
2. EWK:	free	free	+ 5V (X31:13)
	X31:14	X31:18	⊥

Tacho integrated circuit (tacho-IC)

The tacho-IC processes the signals of the encoder (incremental rotary position encoder) HWI.
It serves as an interface between the HWI and the processor of the corresponding function area and is used wherever degree–dependent control functions are required. In this way the immediate evaluation of the necessary signals between the function areas is possible without delays.

The following functions are implemented by the tacho-IC:

- determination of speed,
- determination of direction of rotation,
- signal conditioning,
- . . .

Through these and other functions the pulses supplied by the HWI are synchronized, checked, filtered, converted and conditioned for the processor.

Servo-drive integrated circuit (SSK-IC)

All functions necessary to control a servo–drive are implemented by the SSK-IC.
The operator enters the setpoint values.
The positioning of the servo–drive occurs via the EWK servo–drive section. The EWK/E section takes over the control of the servo–drive via the motor jumper and the motor potentiometer.

Input/output IC (I/O-IC)

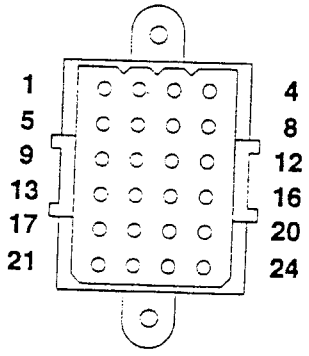
The signals from the 24V DC–inputs and outputs (except for safety inputs) for the electronic control system of the press, pass through the input/output ICs.
If the I/O-IC has been programmed to serve as an output, it switches eight outputs via output drivers. These outputs are short–circuit proof.
After the I/O-IC has been programmed to serve as an input, feelers, sensors, position switches etc. are read in via the input.

Serial interfaces

The EWK/E is responsible for two serial interfaces for which differently wired plugs are provided. The pin assignment of these plugs is for certain devices/components (e.g. CPC 1). These devices/ components must be connected to the interfaces according to the circuit diagram of the press.

Pin assignment

X6

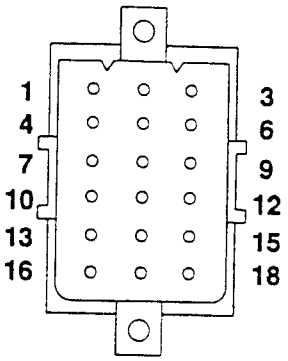


Female connector X6

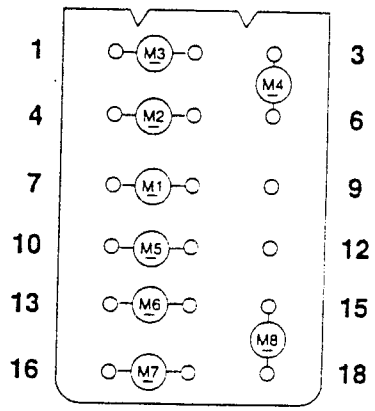
X6 Analog inputs
(potentiometers of servo–drives)

Pin	Function
1	Potentiometer tap motor 1
2	Potentiometer tap motor 2
3	Potentiometer tap motor 3
4	Potentiometer tap motor 4
5,6,7,8,17,18, 19,20	⊥ 15V DC
9,10,11,12, 21,22,23,24	Reference voltage for potentiometer
13	Potentiometer tap motor 5
14	Potentiometer tap motor 6
15	Potentiometer tap motor 7
16	Potentiometer tap motor 8

X9

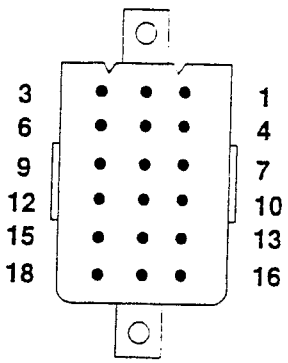


Female connector X9



Connection diagram for servo–drive motors

X31



Male connector X31

X9 Servo–drive motors

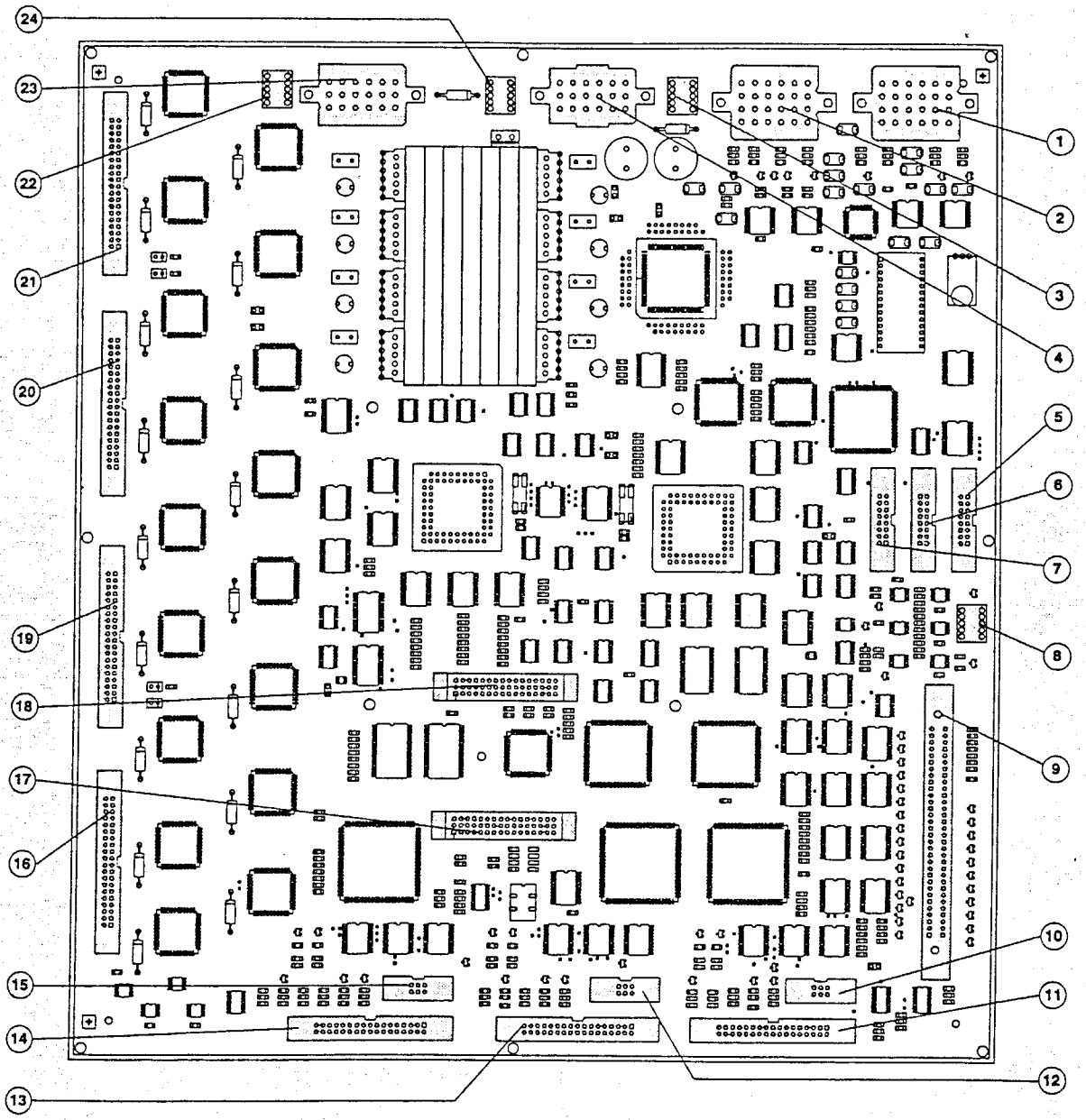
Pin	Function
1	– motor 3
2	+ motor 3
3	– motor 4
4	– motor 2
5	+ motor 2
6	+ motor 4
7	– motor 1
8	+ motor 1
9,12	Not used
10	– motor 5
11	+ motor 5
13	– motor 6
14	+ motor 6
15	– motor 8
16	– motor 7
17	+ motor 7
18	+ motor 8

X31 Power supply EWK

Pin	Function
1	+ 15V DC
2,3	24V DC motors
4,5	5V DC
6	– 15V DC
7,16	⊥ 24V I/O
8	⊥ 15V DC
9,10	⊥ 5V
11,12	⊥ 24V motors
13,14, 17,18	Coding EWK
15	24V DC I/O

EWK Extension board

Structure



Extension board EWK

SM 74

① X6 Female connector, analog inputs (potentiometers of servo-drives)

② X40 Female connector, analog inputs

③ X70 Screw terminal, not used

④ X31 Male connector, power supply EWK (NTM)

⑤ X34 Male connector, serial interface [1]

⑥ X32 Male connector, serial interface [1]

⑦ X33 Male connector, serial interface [1]

⑧ X73 Screw terminal, compensating ground (digital ground) EWKs/ZSK

⑨ X1 Male connector, parallel bus ZSK/EWKs

⑩ X55 Male connector, self-regulating auxiliary drives [2]

⑪ X54 Male connector, auxiliary drives (LTM)

⑫ X53 Male connector, self-regulating auxiliary drives [2]

⑬ X52 Male connector, auxiliary drives (LTM)

⑭ X50 Male connector, auxiliary drives (LTM)

⑮ X51 Male connector, self-regulating auxiliary drives [2]

⑯ X14 Male connector, inputs/outputs 97 – 128 (EVM)

⑰ X61 Female connector, plug-in location AEM

⑱ X60 Female connector, plug-in location AEM

⑲ X13 Male connector, inputs/outputs 65 – 96 (EVM)

⑳ X12 Male connector, inputs/outputs 33 – 64 (EVM)

㉑ X11 Male connector, inputs/outputs 1 – 32 (EVM)

㉒ X71 Screw terminal, not used

㉓ X9 Female connector, servo-drive motors

㉔ X72 Screw terminal, not used

[1] See EWK "Function", serial interface

[2] Assignment depending on application or configuration, e.g. KLM

SA 52

① X6 Female connector, analog inputs (potentiometer servo–drives)

② X40 Female connector, analog inputs (e.g. double–sheet sensor, pressure sensor pneumatic system compressor) [2]

③ X70 Screw terminal, ⊥ 5V

④ X31 Male connector, power supply EWK (NTM)

⑤ X34 Male connector, serial interface [1]

⑥ X32 Male connector, serial interface [1]

⑦ X33 Male connector, serial interface [1]

⑧ X73 Screw terminal, ⊥ 5V

⑨ X1 Male connector, parallel bus for extensions

⑩ X55 Male connector, self–regulating auxiliary drives [2]

⑪ X54 Male connector, auxiliary drives (LTM)

⑫ X53 Male connector, self–regulating auxiliary drives [2]

⑬ X52 Male connector, auxiliary drives (LTM)

⑭ X50 Male connector, auxiliary drives (LTM)

⑮ X51 Male connector, self–regulating auxiliary drives [2]

⑯ X14 Male connector, inputs/outputs 97 – 128 (EVM)

⑰ X61 Female connector, plug–in location AEM

⑱ X60 Female connector, plug–in location AEM

⑲ X13 Male connector, inputs/outputs 65 – 96 (EVM)

⑳ X12 Male connector, inputs/outputs 33 – 64 (EVM)

㉑ X11 Male connector, inputs/outputs 1 – 32 (EVM)

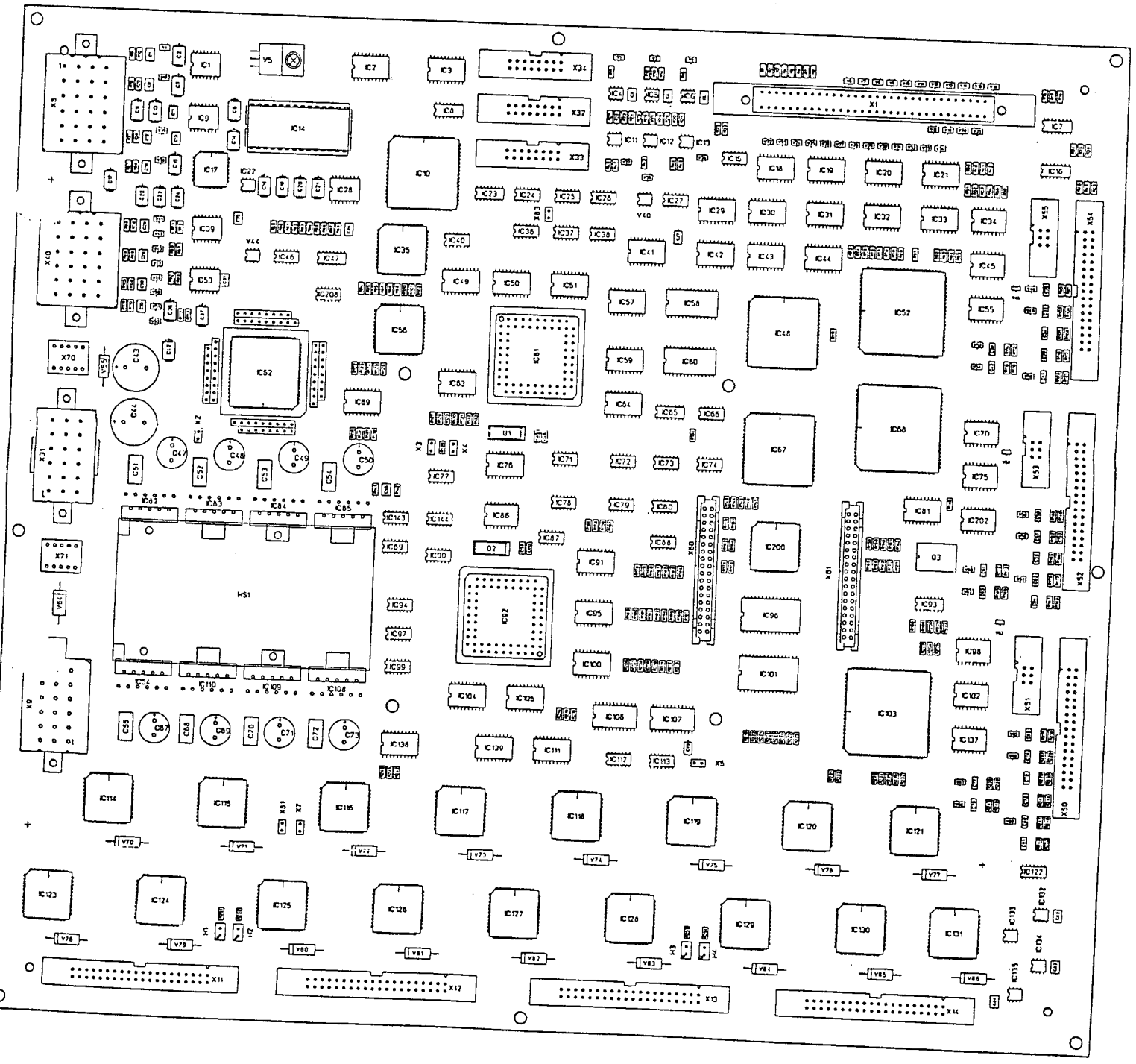
㉒ X71 Screw–type terminal, ⊥ $24V_{I/O}$, connected [2]

㉓ X9 Female connector, servo–drive motors

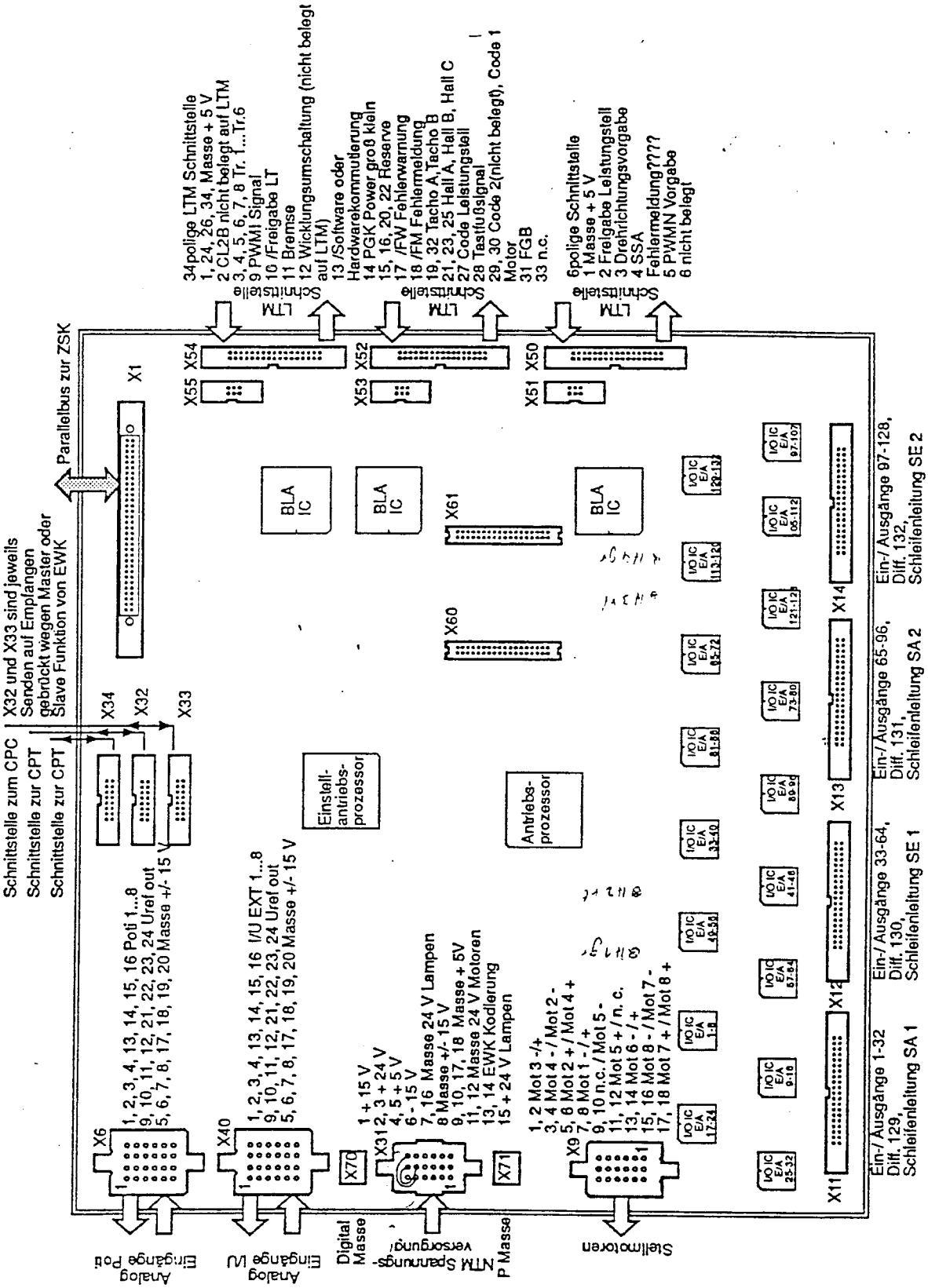
㉔ X72 Screw–type terminal, ⊥ 24V, (servo–drives)

[1] See EWK "Function", serial interfaces

[2] Application–dependent, assignment dependent on application and/or configuration, e.g. KLM



Steckerbelegung EWK



LED's

Gruppe grün 20 Hauptprgr. zykl. = ON = Aus Zählfrequenz

rot Antriebs CPU = Aus

Gruppe grün flimmert Einstell CPU läuft 1 Hauptprgr. zykl. ein

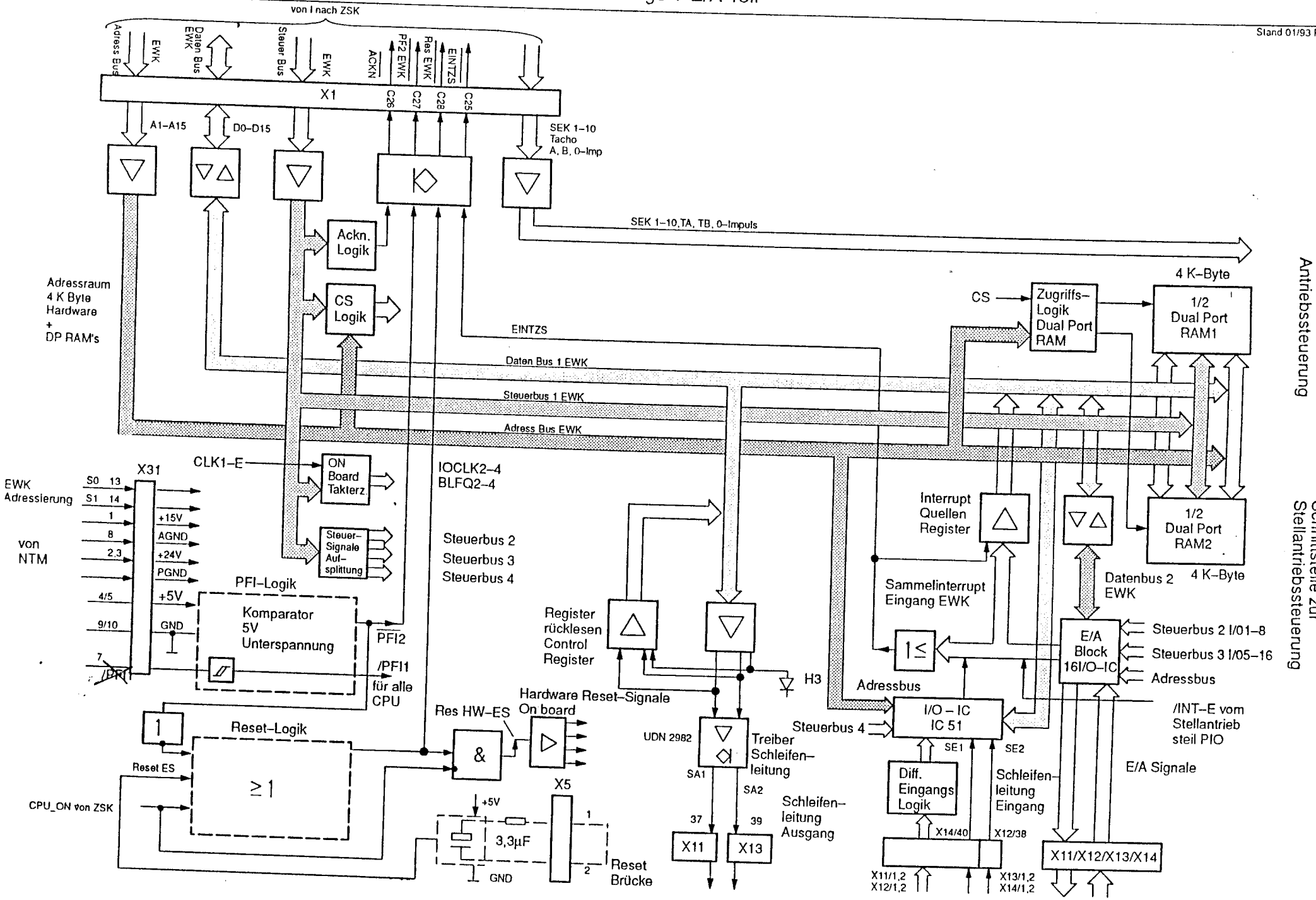
rot = Aus

H1 grün
H2 rot
H3 rot
H4 grün

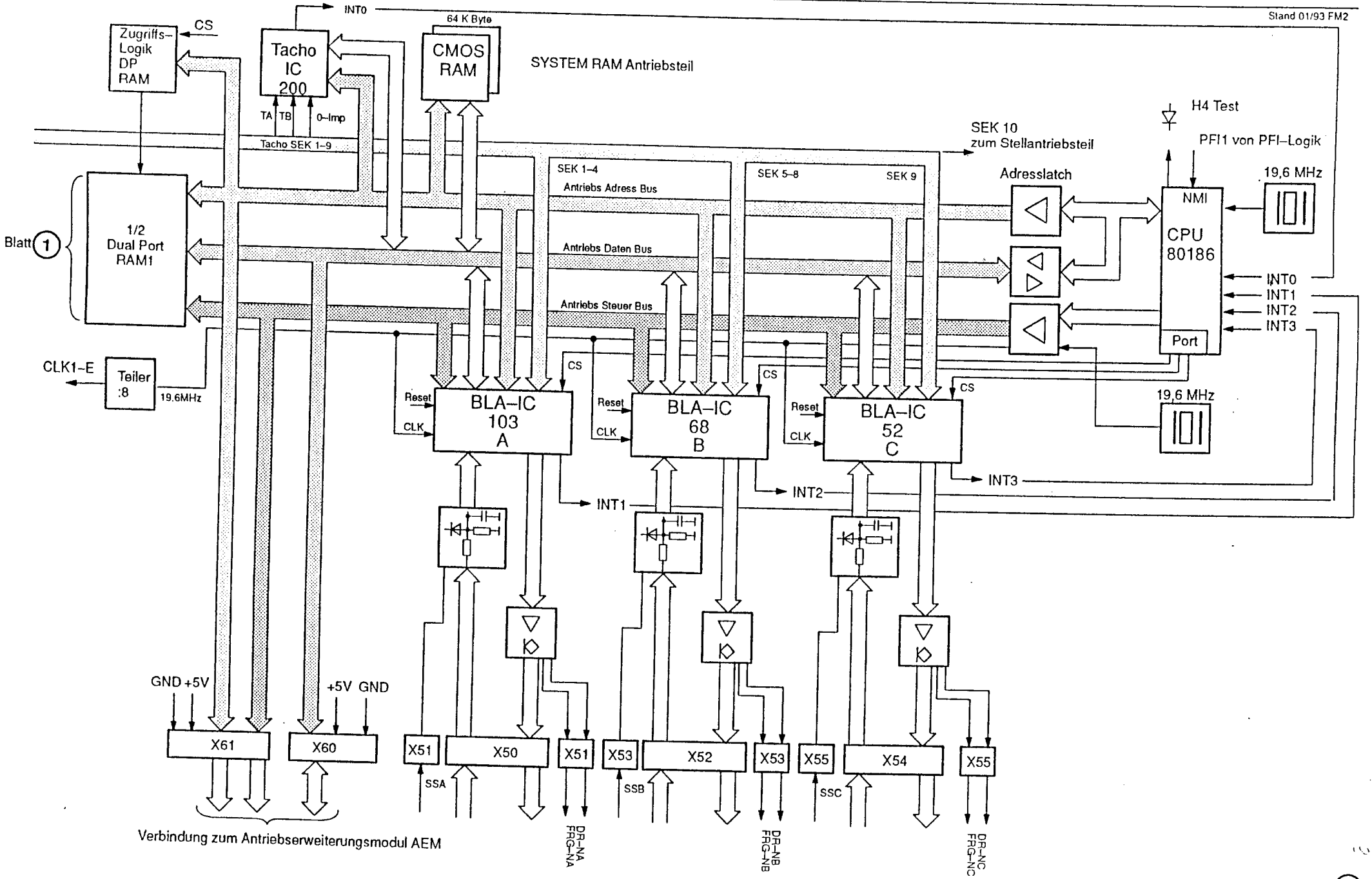
Blockschaltbild EWK Steuerungs + E/A Teil

HEIDELBERG

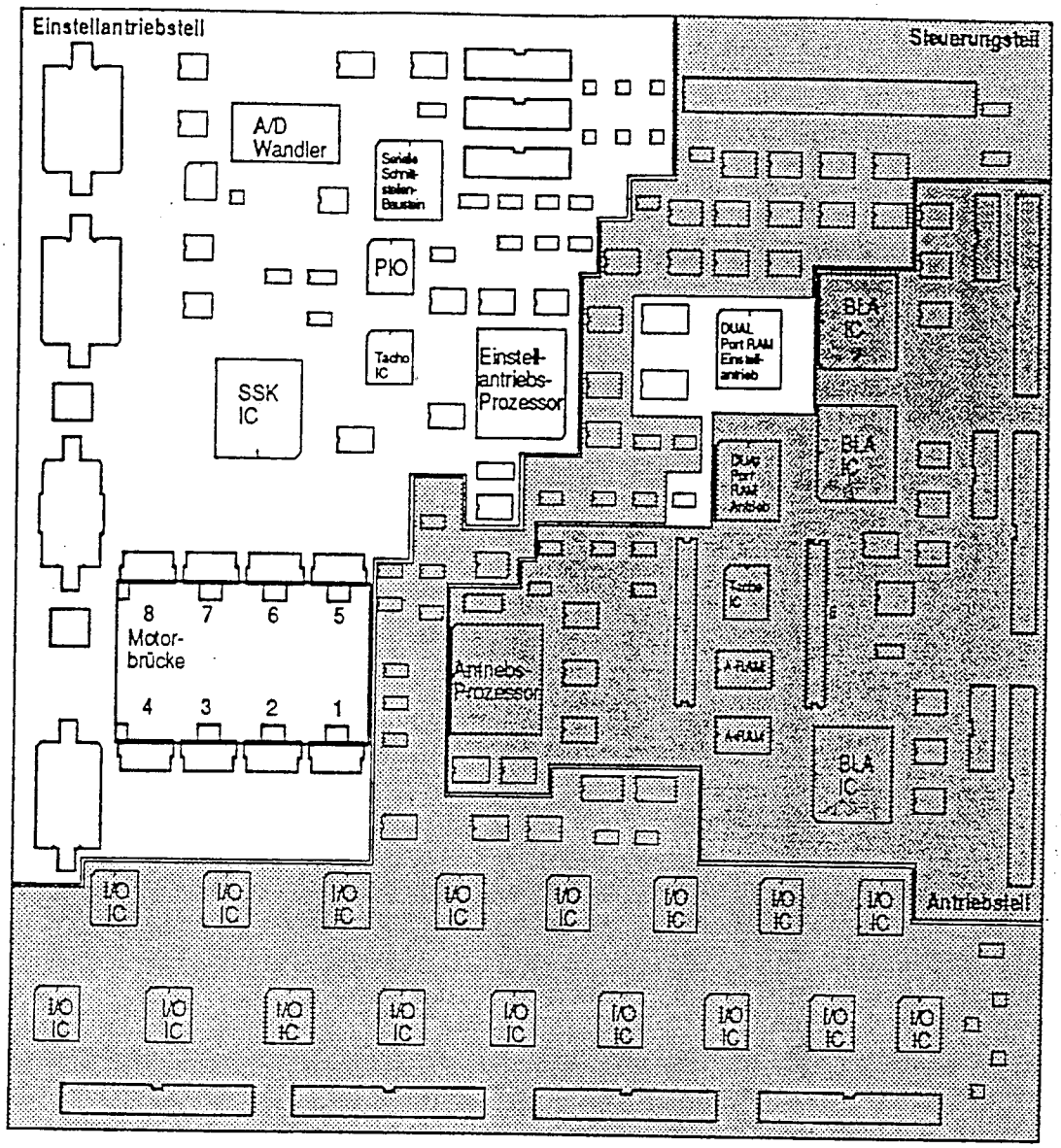
Stand 01/93 FM2



Blockschaltbild EWK
Hilfsantriebsteil



Steuerungs-, Antriebs- und Einstellantriebsteil EWK



EWK Bestückung
S/W Extern

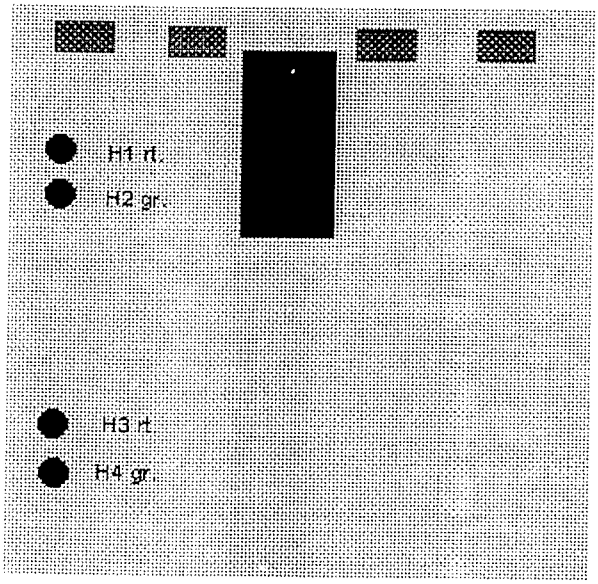
EWKBE_SW.FH3

Fehleranzeige über die ZSK-LED´s

rote LED rechts oben blinkt = Antriebsteil auf der ZSK arbeitet

rot	grün 1	grün 2	
glimmen	glimmen	glimmen	Reset
ein	ein	ein	power fail Netzteil (PF_1) oder Fehler im minimalen Rechnersystem
ein	aus	aus	power fail Netzteil (PF_1)
ein	ein	aus	watsch dog abgelaufen
ein	aus	ein	power fail ewk
aus	aus	aus	es wurde kein Fehler erkannt (ok Zustand)

EWK



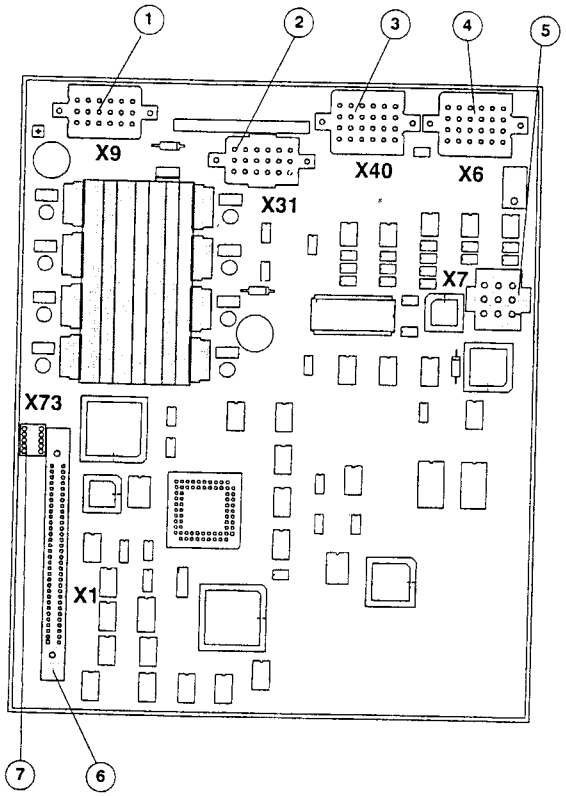
LED Zustände auf der EWK

H1 und H2 zeigen den Zustand des E-Teils auf der jeweiligen EWK an.
H1 blinkt, wenn der Bootvorgang (E-Rechner) beendet ist.
H2 blinkt, wenn sich der E-Rechner im Hauptprogramm befindet.

H3 und H4 zeigen den Zustand des A-Teils auf der jeweiligen EWK an.
H3 blinkt, wenn der A-Rechner auf der EWK läuft.
H4 hat keine Bedeutung (LED ist aus).

EWK2 Extension board

Design



Extension board EWK2

① X9 Female connector, servo-drive motors

② X31 Male connector,
power supply EWK2 (from NTM)

③ X40 Female connector,
analog inputs (dependent on application,
e.g. double-sheet sensor, pressure sensor,
pneumatic system compressor)

④ X6 Female connector, analog inputs
(potentiometers of servo-drives)

⑤ X7 Male connector,
digital inputs/outputs (dependent on
application, e.g. washup device)

⑥ X1 Male connector, parallel bus for
extension boards

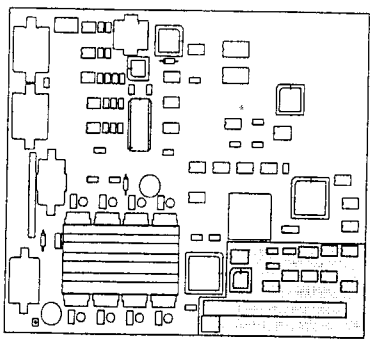
⑦ X73 Screw terminal, $\perp$ 5V/24$V_{I/O}$

Task

The extension board EWK2 implements additional control functions, and together with the ZSK and the EWK it is the core of the CPTronic compact. The EWK2 is divided into two essential function areas:

Control section EWK2-S

The control section of the EWK2 only contains the parallel bus coupling, i.e. the extension interface (ZSK/EWK-BUS).

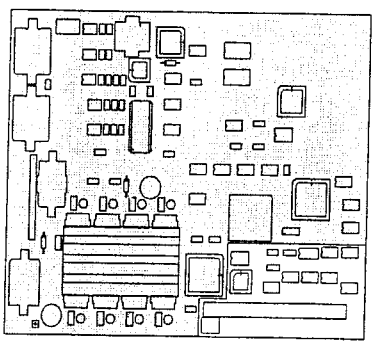


Control section EWK2-S

Servo-drive section EWK2-E

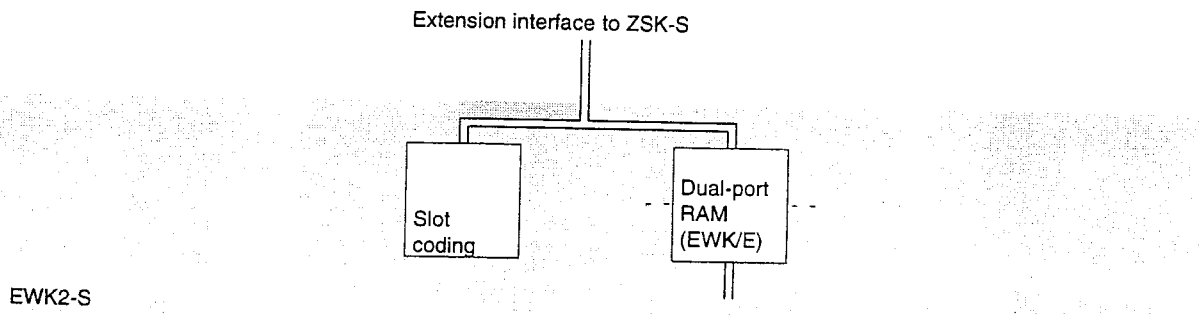
The servo-drive section of the EWK2

- controls (max. eight) servo-drives,
- evaluates the analog voltage inputs of the (max. eight) servo-drive potentiometers via an A/D-converter,
- has eight more analog inputs which can be configured as current/voltage inputs,
- receives the signals from eight digital input/outputs.

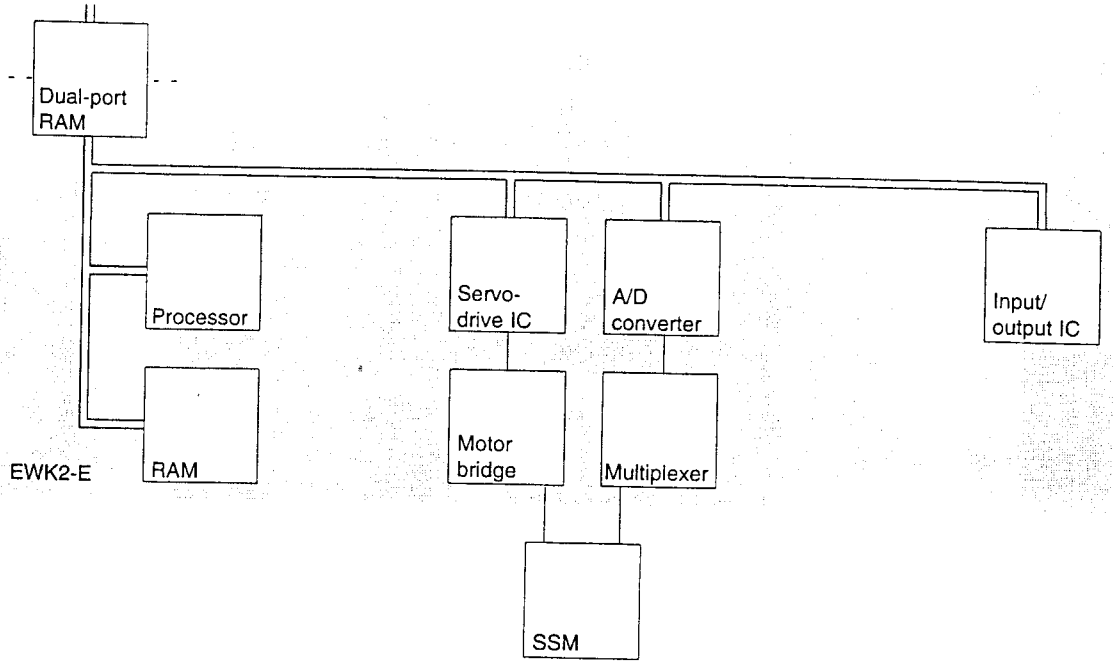


Servo-drive section EWK2-E

Block diagrams



Simplified block diagram of EWK2-S



Simplified block diagram of EWK2-E

Function

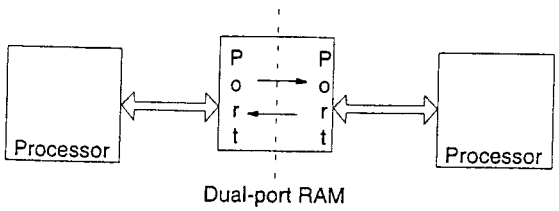
The two function areas of the EWK2 perform their control functions independently of each other:

- the servo-drive section EWK2-E is equipped with a processor,
- the control section EWK2-S uses the processor of the ZSK.

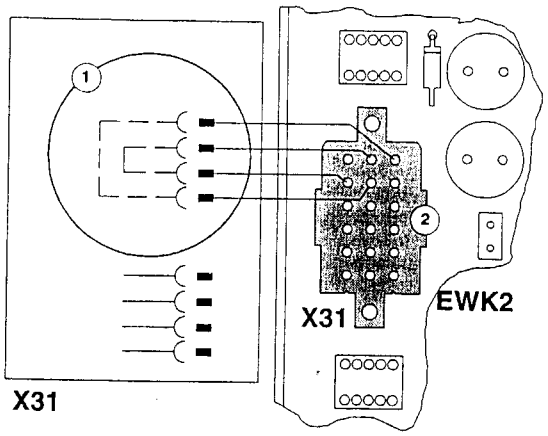
The communication and data exchange between these sections is effected via a dual-port RAM.

Dual-port RAM

The dual-port-RAM is a memory IC and serves as an interface between the individual function areas. It allows two processors to access the same memory. Both ports can be controlled separately. Both processors have independent read and write access to this IC. Internal lock-outs ensure consistent information.



Schematic representation of dual-port RAM



Coding in connector X31

Slot coding, EWK2-S

① Coding in connector X31 of the set of cables

Depending on the press configuration different EWKs can be used. The ZSK is responsible for the EWK. The coding in the set of cables helps the ZSK to identify the slot of the EWK (type x).
The coding is effected in the connector of the set of cables X31 ① which leads to connector EWK2-X31 ②.

Example: SM 52-1

Board no.	Connection from	to	Level
1st **EWK2:**	X31:13	X31:17	⊥
	X31:14	X31:18	⊥

Example: SM 52-2

Board no.	Connection from	to	Level
1st EWK:	X31:13	X31:17	⊥
	X31:14	X31:18	⊥
2nd **EWK2:**	free	free	+5V (X31:13)
	X31:14	X31:18	⊥

Input/output IC (I/O-IC), EWK2-E

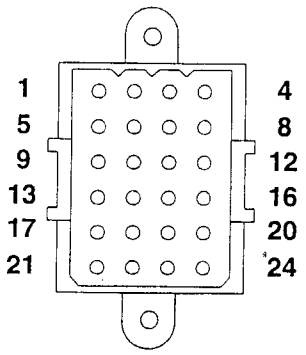
The signals from the 24V DC inputs and outputs of the EWK-E section are transmitted via an input/output IC.
If the I/O-IC has been programmed to serve as output, it switches eight outputs via output drivers. These outputs are short-circuit proof.
When the I/O-IC has been programmed to serve as input, signals are read in via the inputs.

Servo-drive IC (SSK-IC), EWK2-E

All functions necessary to control a servo-drive are implemented by the SSK-IC.
The operator enters the setpoint values.
The servo-drive section of the EWK2 positions the drive. The EWK2/E section regulates the drives via the motor bridges and motor potentiometers or via the motor bridges and motor encoder.

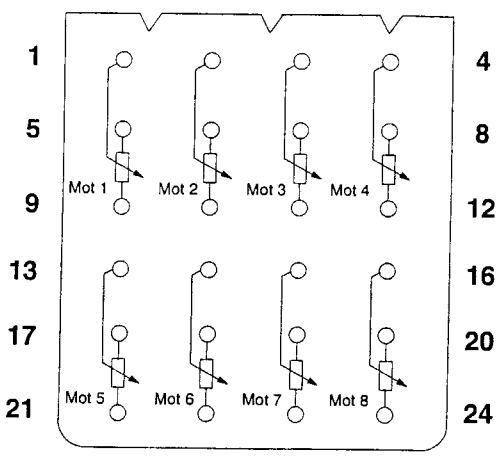
Pin assignment

X6



Female connector X6

X6

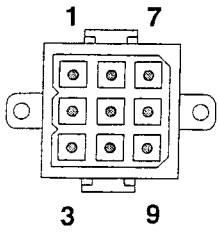


Overview of connections: potentiometers of servo-drives X6

X6 Analog inputs
(potentiometers of servo-drives)

Pin	Function
1	Potentiometer tap motor 1 (Mot 1)
2	Potentiometer tap motor 2 (Mot 2)
3	Potentiometer tap motor 3 (Mot 3)
4	Potentiometer tap motor 4 (Mot 4)
5, 6, 7,8, 17, 18, 19, 20	⊥ 15V (potentiometer)
9, 10, 11, 12, 21, 22, 23, 24	Reference voltage for potentiometer DC +10V
13	Potentiometer tap motor 5 (Mot 5)
14	Potentiometer tap motor 6 (Mot 6)
15	Potentiometer tap motor 7 (Mot 7)
16	Potentiometer tap motor 8 (Mot 8)

X7

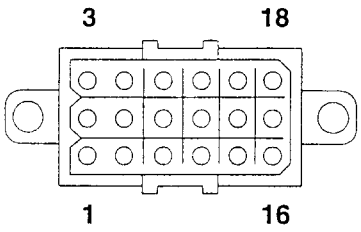


Male connector X7

X7 Digital inputs/outputs

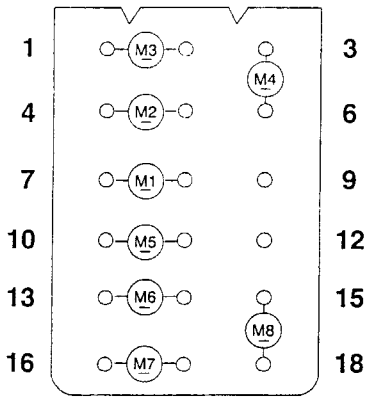
Pin	Function
1	I/0 1
2	I/0 4
3	I/0 2
4	I/0 5
5	I/0 3
6	I/0 6
7	I/0 7
8	I/0 8
9	Not used

X9



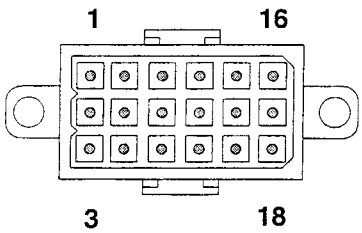
Female connector X9

X9



Overview of connections: servo-drive motors X9

X31



Male connector X31

X9 Servo-drive motors

Pin	Function
1	– motor 3
2	+ motor 3
3	– motor 4
4	– motor 2
5	+ motor 2
6	+ motor 4
7	– motor 1
8	+ motor 1
9,12	Not used
10	– motor 5
11	+ motor 5
13	– motor 6
14	+ motor 6
15	– motor 8
16	– motor 7
17	+ motor 7
18	+ motor 8

X31 Power supply EWK2

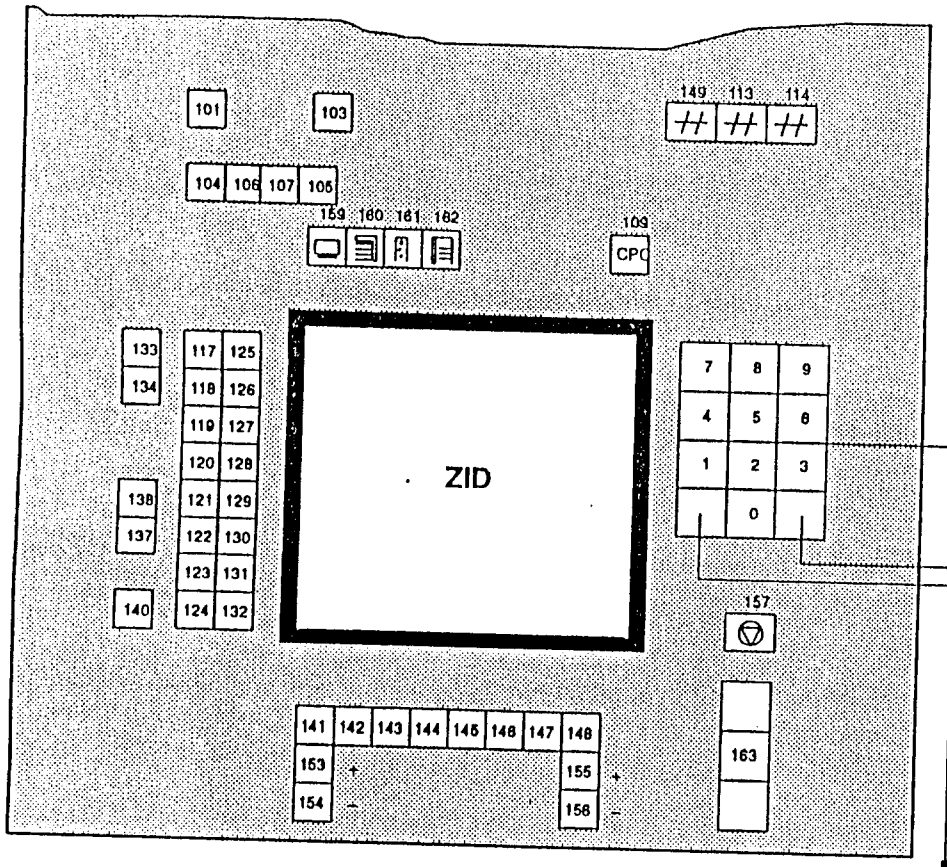
Pin	Function
1	DC +15V
2,3	DC +24V (motors)
4,5	DC +5V
6	DC –15V
7,16	⊥ 24V (I/0)
8	⊥ 15V
9,10	⊥ 5V
11,12	⊥ 24V motors
13,14, 17,18	Coding EWK
15	DC +24V (I/0)

Assignment of connecting cables

Connection EAM	Plug	Function	Service display EAM
EAM-X10	1	Light-up pushbutton: input (green)	1
EAM-X10	2		2
EAM-X10	3	Light-up pushbutton: delete (red)	3
EAM-X10	4	Light-up pushbutton: presetting	4
EAM-X10	5	Light-up pushbutton: washup (only SM74)	5
EAM-X10	6	Light-up pushbutton: preinking (only SM74 with CPC1)	6
EAM-X10	7	Light-up pushbutton: progressives (only SM74 with CPC1)	7
EAM-X10	8		8
EAM-X10	9	Light-up pushbutton: CPC (nur GTOZ-S)	9
EAM-X10	10		10
EAM-X10	11		11
EAM-X10	12	Key-operated switch CPC; EAM-X20:12S / 12R (only SM74)	12
EAM-X10	13	Signal lamp: fault control console (blue)	13
EAM-X10	14	Signal lamp: fault production run (yellow)	14
EAM-X10	15		15
EAM-X10	16		16
EAM-X11	1	Light-up pushbutton: colour button B	17
EAM-X11	2	Light-up pushbutton: colour button C	18
EAM-X11	3	Light-up pushbutton: colour button M	19
EAM-X11	4	Light-up pushbutton: colour button Y	20
EAM-X11	5	Light-up pushbutton: colour button X	21
EAM-X11	6	Light-up pushbutton: colour button Z	22
EAM-X11	7	Light-up pushbutton: colour button U	23
EAM-X11	8	Light-up pushbutton: colour button V	24
EAM-X11	9	Light-up pushbutton: group 1	25
EAM-X11	10	Light-up pushbutton: group 2	26
EAM-X11	11	Light-up pushbutton: group 3	27
EAM-X11	12	Light-up pushbutton: group 4	28
EAM-X11	13	Light-up pushbutton: group 5	29
EAM-X11	14	Light-up pushbutton: group 6	30
EAM-X11	15	Light-up pushbutton: group 7	31
EAM-X11	16	Light-up pushbutton: group 8	32
EAM-X12	1	Light-up pushbutton: preselection display	33
EAM-X12	2	Light-up pushbutton: actual value display	34
EAM-X12	3		35
EAM-X12	4		36
EAM-X12	5	Light-up pushbutton: service display	37
EAM-X12	6	Light-up pushbutton: fault display	38
EAM-X12	7	Additional light-up pushbutton: entry of variant code	39
EAM-X12	8	Light-up pushbutton: fine display	40
EAM-X12	9	Light-up pushbutton: function button 1	41
EAM-X12	10	Light-up pushbutton: function button 2	42
EAM-X12	11	Light-up pushbutton: function button 3	43
EAM-X12	12	Light-up pushbutton: function button 4	44

Connection EAM	Plug	Function	Service display EAM
EAM-X12	13	Light-up pushbutton: function button 5	45
EAM-X12	14	Light-up pushbutton: function button 6	46
EAM-X12	15	Light-up pushbutton: function button 7	47
EAM-X12	16	Light-up pushbutton: function button 8	48
EAM-X13	1	Signal lamp: fault press (red)	49
EAM-X13	2		50
EAM-X13	3		51
EAM-X13	4		52
EAM-X13	5	Pushbutton: adjustment button plus (left)	53
EAM-X13	6	Pushbutton: adjustment button minus (left)	54
EAM-X13	7	Pushbutton: adjustment button plus (right)	55
EAM-X13	8	Pushbutton: adjustment button minus (right)	56
EAM-X13	9	Pushbutton: stop	57
EAM-X13	10	Light-up pushbutton: input numeric keypad I (green)	58
EAM-X13	11	Light-up pushbutton: unit "Global press"	59
EAM-X13	12	Light-up pushbutton: unit "Delivery"	60
EAM-X13	13	Light-up pushbutton: unit "Printing unit"	61
EAM-X13	14	Light-up pushbutton: unit "Feeder"	62
EAM-X13	15	"Emergency stop" button ; EAM-X20: 1/2 (only for SM74 with ZSP)	63
EAM-X13	16		64
EAM-X14	1	Light-up pushbutton: diagonal register forward D.S., left button in upper row (only for SM74-2 with KSP)	65
EAM-X14	2	Light-up pushbutton: circumferential register forward, central button in upper row (only for SM74-2 with KSP)	66
EAM-X14	3	Light-up pushbutton: diagonal register forward O.S., right button in upper row (only for SM74-2 with KSP)	67
EAM-X14	4	Light-up pushbutton: lateral register D.S., left button in middle row (only for SM74-2 with KSP)	68
EAM-X14	5	Light-up pushbutton: CPC functions, central button in middle row (only for SM74-2 with KSP)	69
EAM-X14	6	Light-up pushbutton: lateral register O.S., right button in middle row (only for SM74-2 with KSP)	70
EAM-X14	7	Light-up pushbutton: diagonal register backward D.S, left button in bottom row (only for SM74-2 with KSP)	71
EAM-X14	8	Light-up pushbutton: circumferential register backward, central button in bottom row (only for SM74-2 with KSP)	72
EAM-X14	9	Light-up pushbutton: diagonal register backward O.S, right button in bottom row (only for SM74-2 with KSP)	73
EAM-X14	10		74
EAM-X14	11		75
EAM-X14	12		76
EAM-X14	13		77
EAM-X14	14		78
EAM-X14	15		79
EAM-X14	16		80

Note: Plug EAM-X15 is not used.



Anschlußbelegung
Pin configuration
Affectation des connecteurs
1=DNK-X1
2=DNK-X2
3=DNK-X3
4=DNK-X4
5=DNK-X5
6=DNK-X6
7=DNK-X7
8=DNK-X8
9=DNK-X9
0=DNK-X10

EAM X158

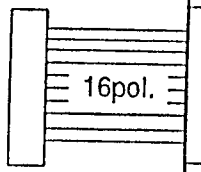
DNK X11

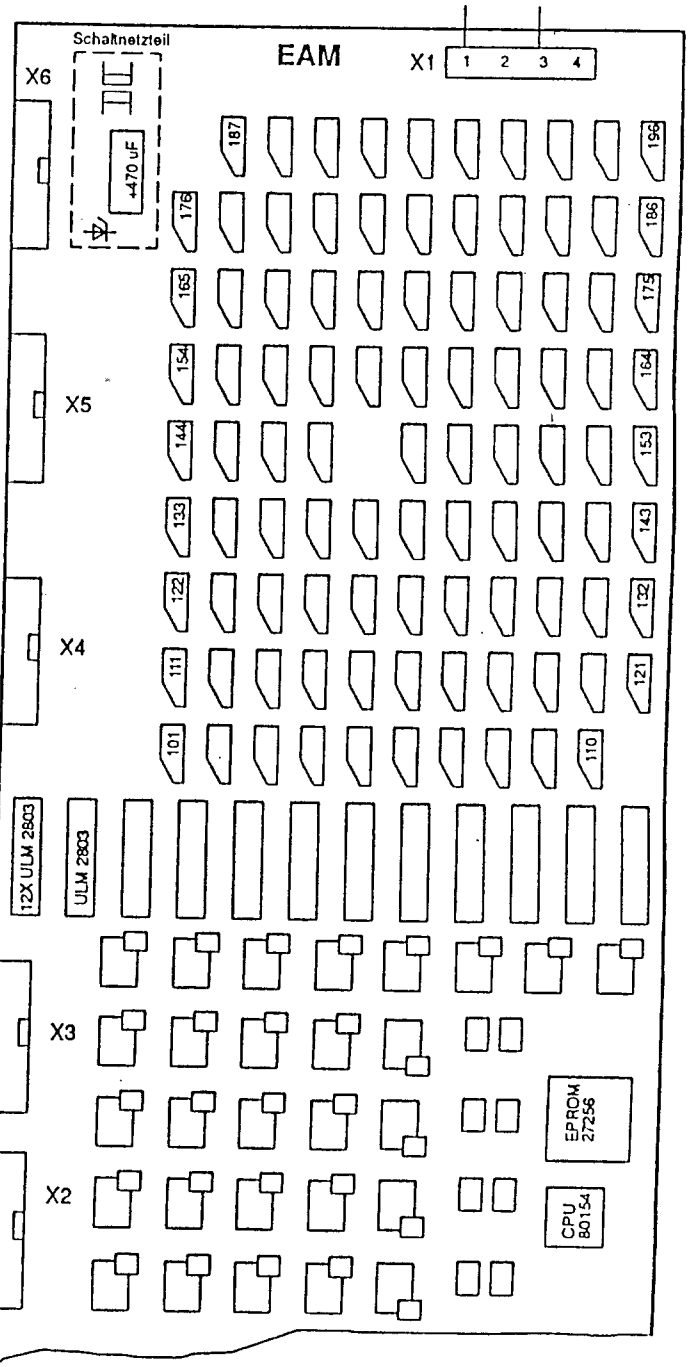
Bedienfeld Zentral Steuerpult
Operation panel central control console
Panneau de commande pupitre central de commande

Beispiel: 149
Example:
Exemple:

wird kontaktiert an
to be contacted with
est connecté à

X149

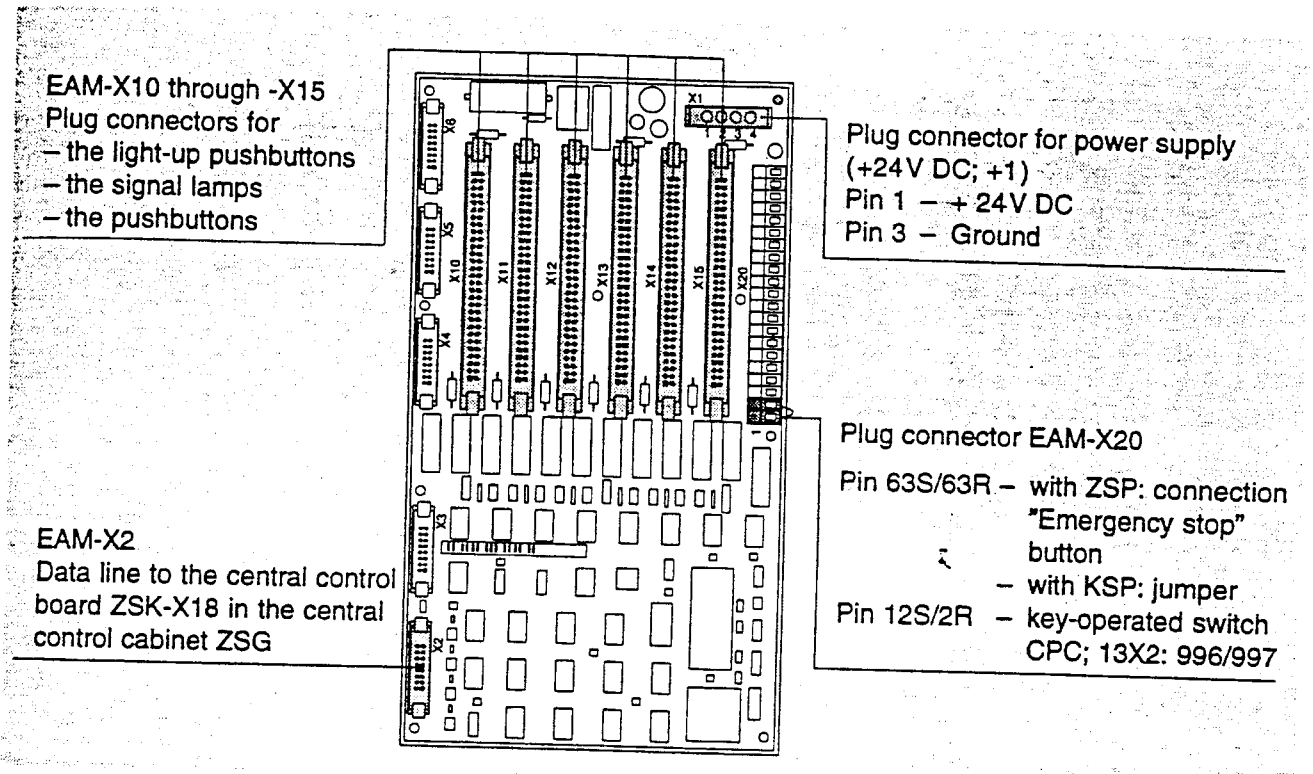




EAM Input/output module

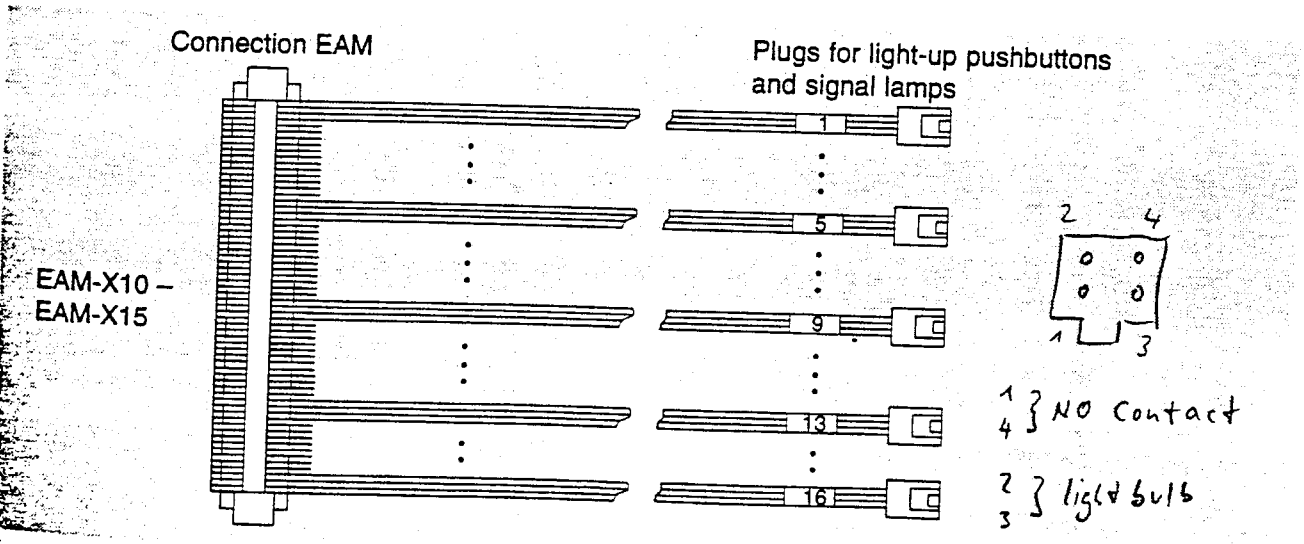
24V lamp red colour code
12V lamp blue colour code

Structure

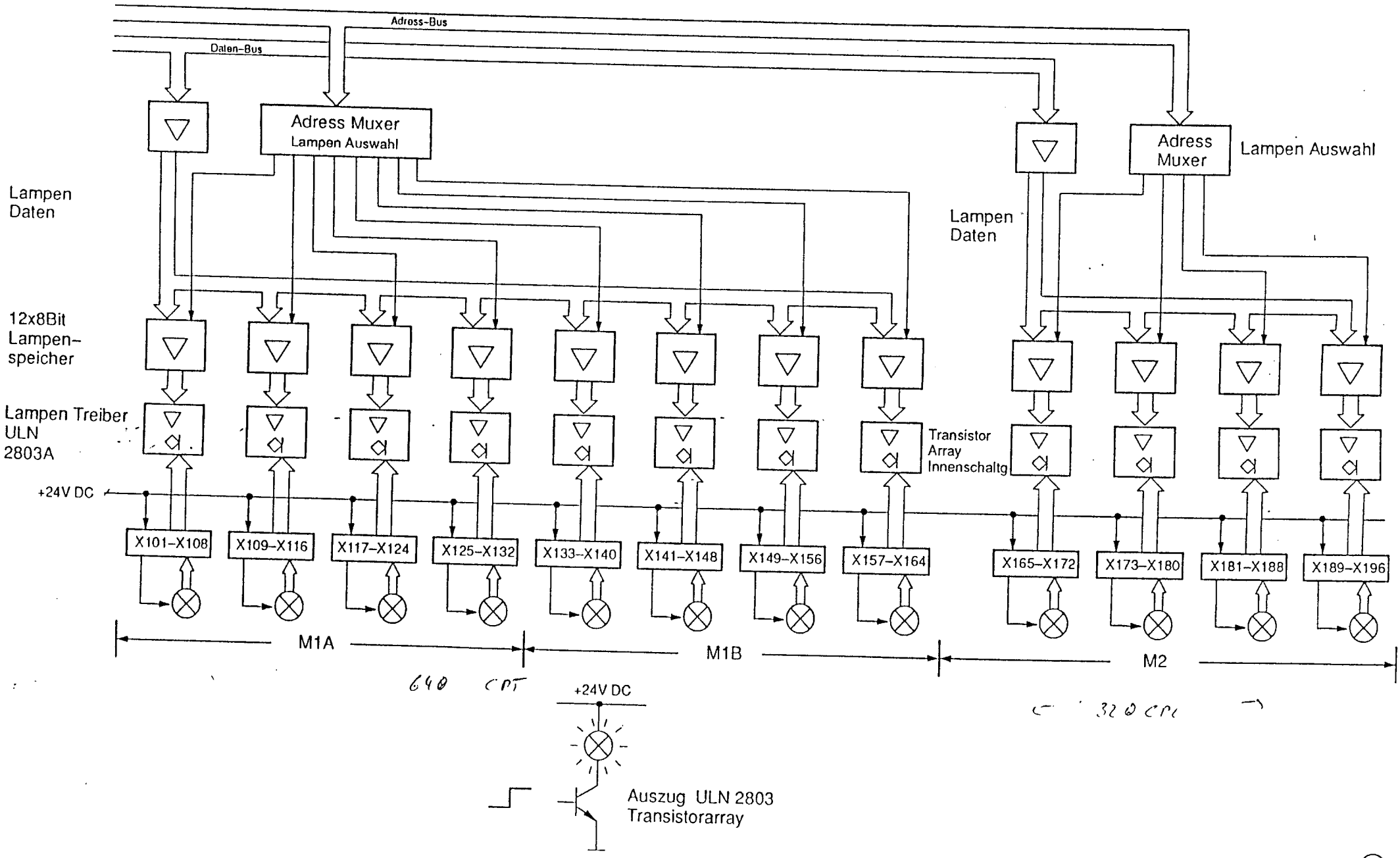


Input/output module EAM

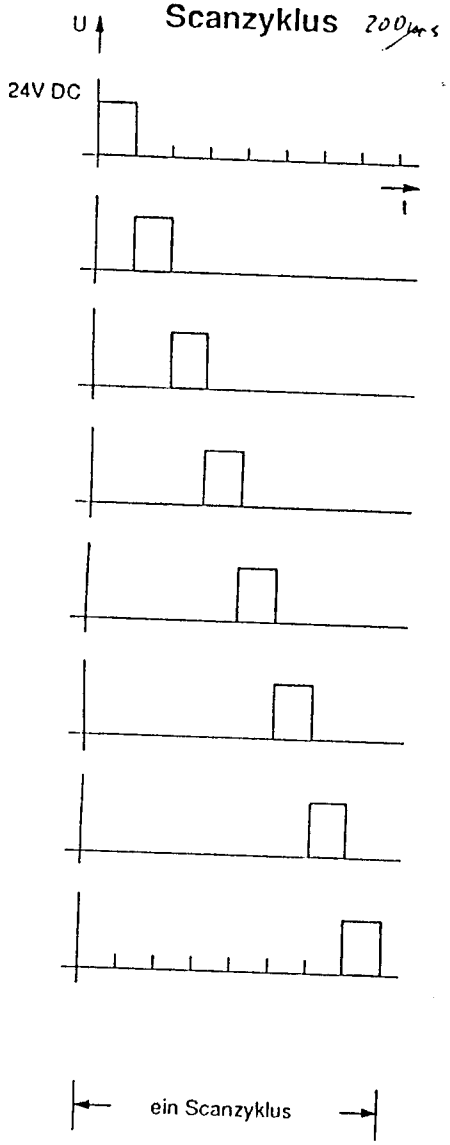
Connecting cable: EAM – operating panel

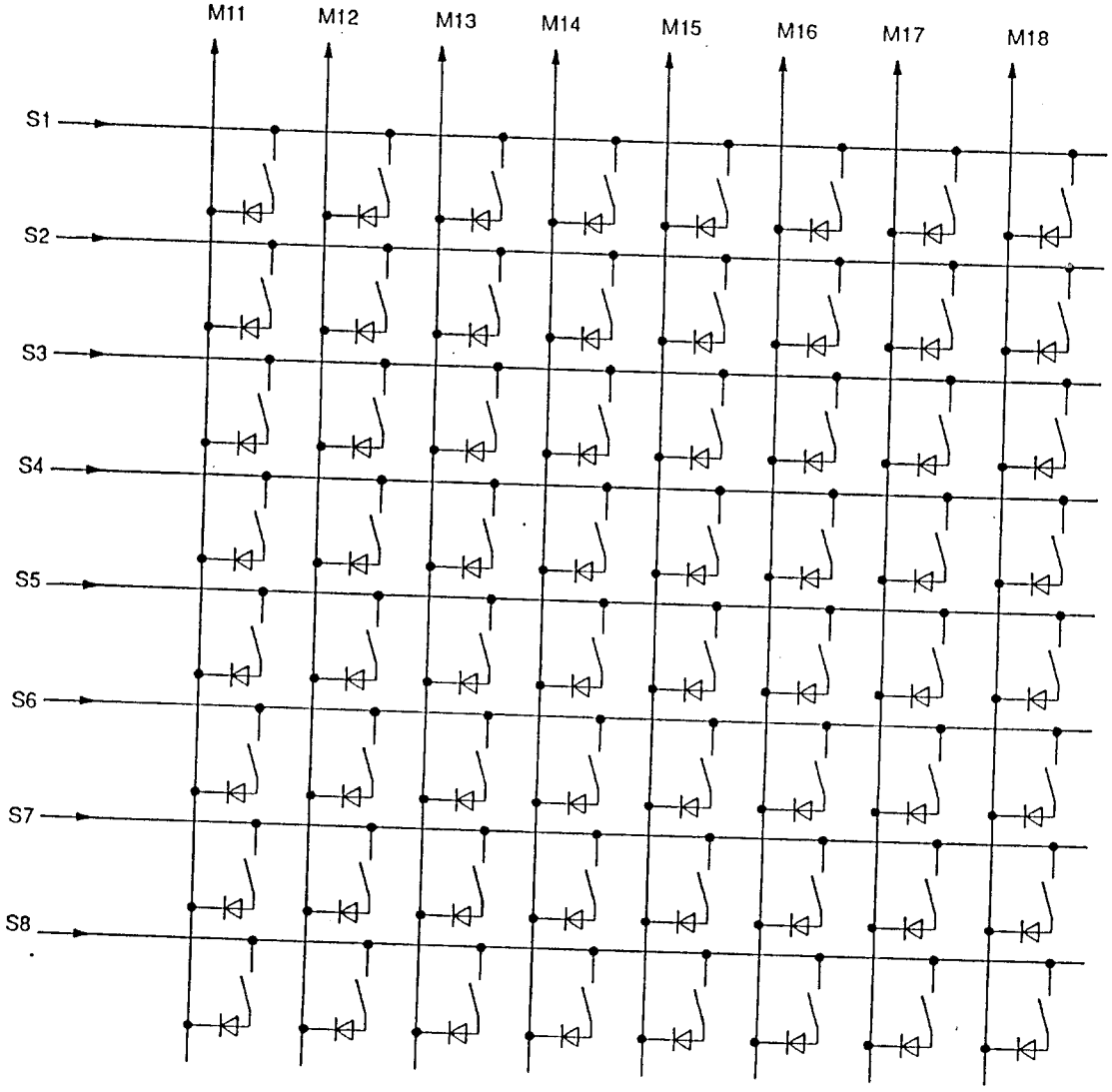


Connecting cable EAM – light-up pushbuttons / signal lamps

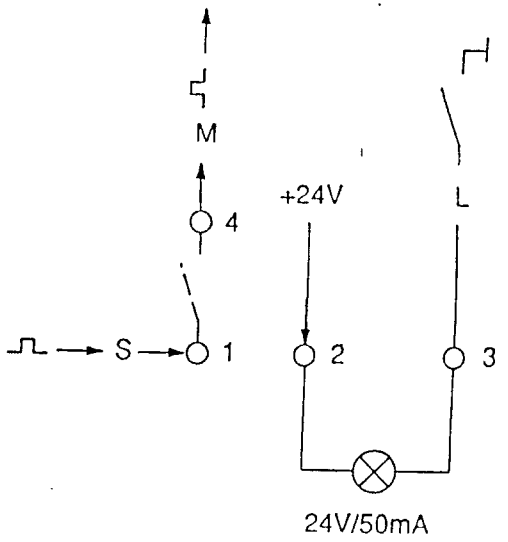

Adross-Bus
Daten-Bus
Adress Muxer
Lampen Auswahl
Lampen
Daten
12x8Bit
Lampen-
speicher
Lampen Treiber
ULN
2803A
+24V DC
X101–X108
X109–X116
X117–X124
X125–X132
X133–X140
X141–X148
X149–X156
X157–X164
Transistor
Array
Innenschaltg
Adress
Muxer
Lampen Auswahl
Lampen
Daten
X165–X172
X173–X180
X181–X188
X189–X196
M1A
M1B
M2
640 cm
320 cm
+24V DC
Auszug ULN 2803
Transistorarray

Scanzyklus 200µs



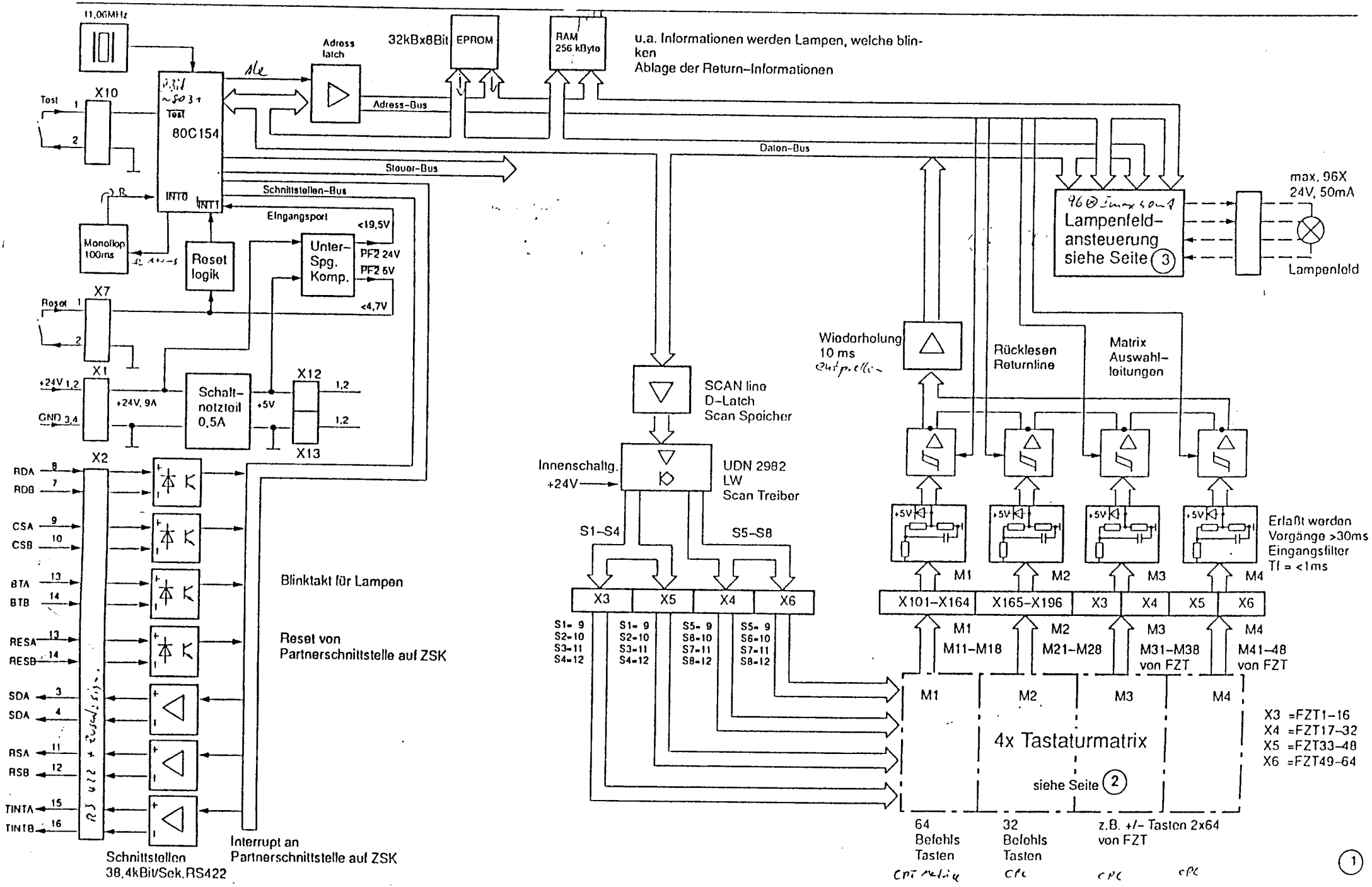


Steckerbelegung Leuchtdrucktaster



Kompaktelektronik
Blockschaltbild EAM
Gesamtübersicht

HEIDELBERG



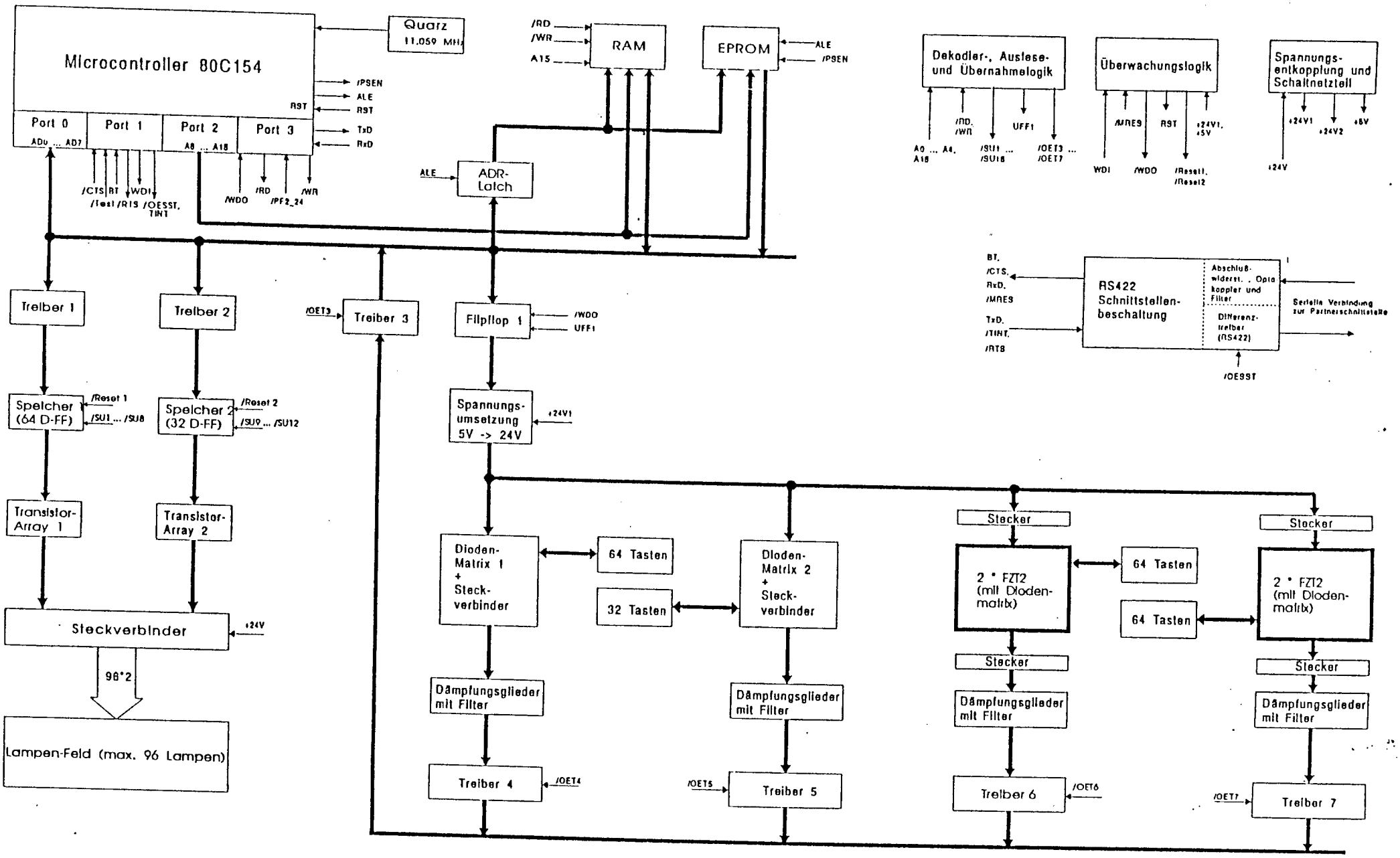
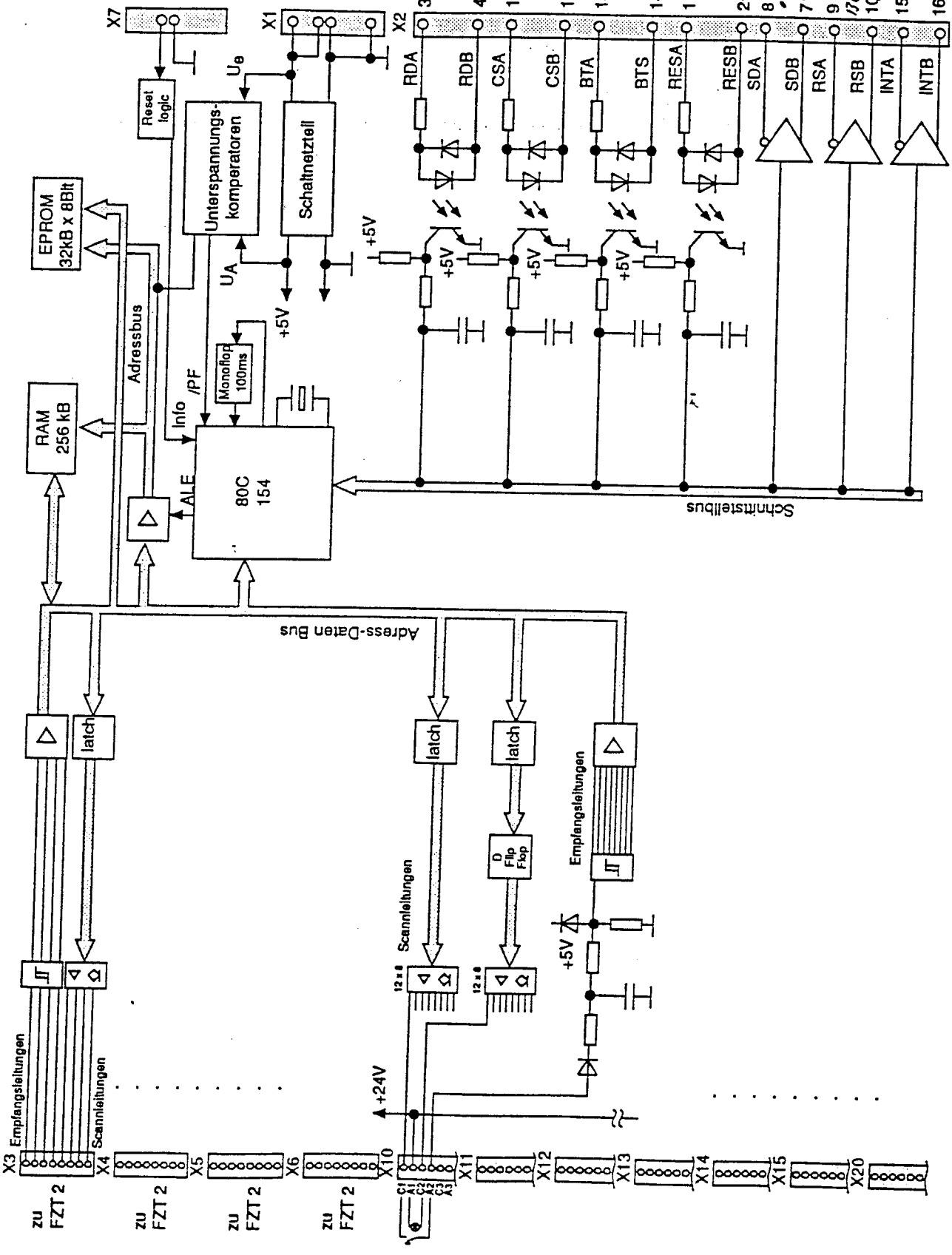
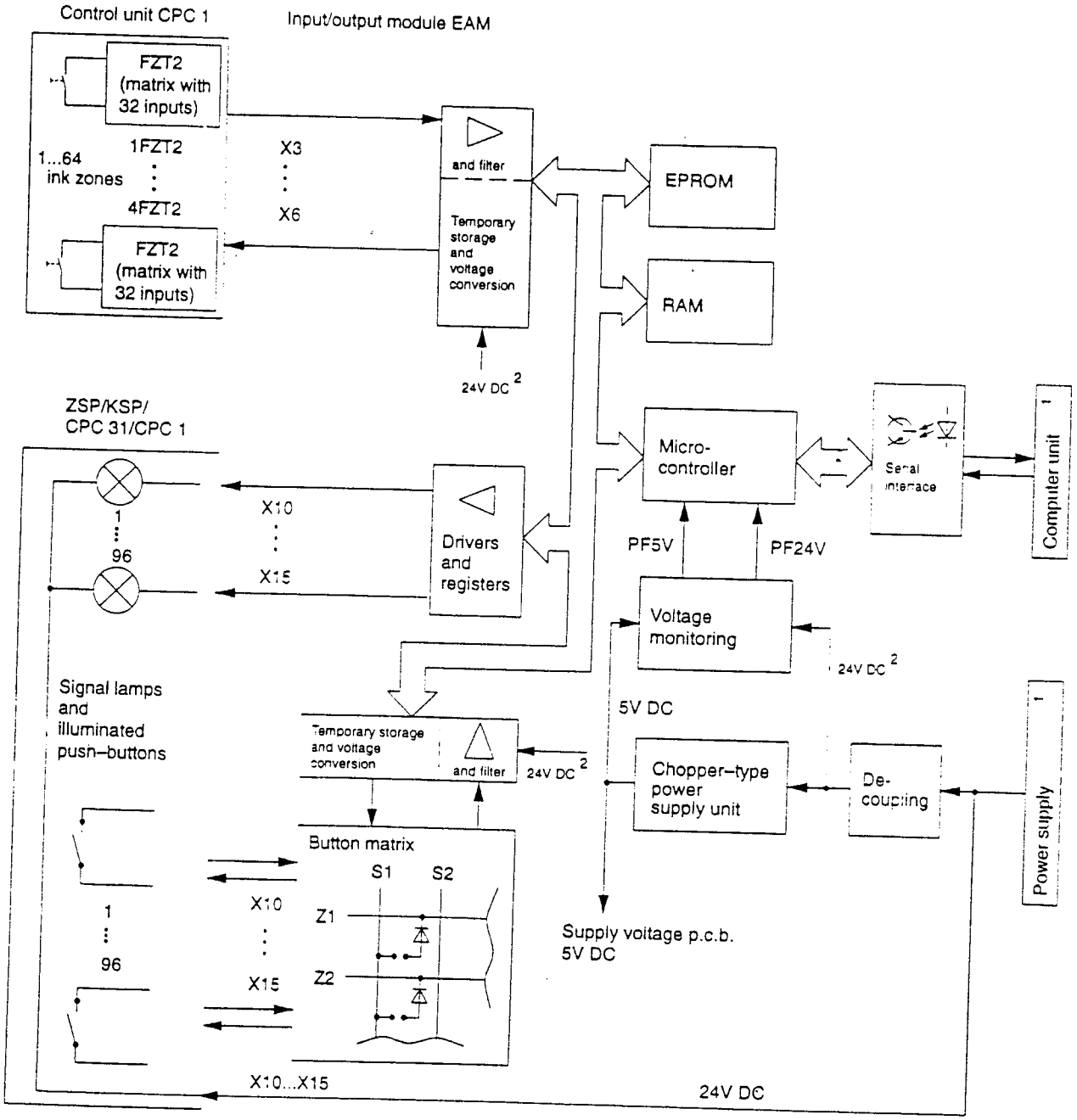


Bild 2: FAM Blockschaltbild 2

Blockschaltbild EAM



Block diagram



Simplified block diagram: EAM

[1] Dependent on application

[2] Decoupled voltage 24V DC

Function

The present circuit states of the buttons of the connected control unit (central control console, compact control console, plate image reader CPC 31, control unit CPC 1) are transmitted to the connected processor unit (ZSK, BEK, REK) via a serial interface.
The decision as to which of the signal lamps will be activated is taken by the connected computer. Activation itself is again effected by the EAM.

Power supply and chopper–type power supply unit

The EAM is supplied with 24V DC.
From this voltage, the chopper–type power supply unit generates 5V DC for the logic section of the module.
For lamp activation and interrogation of the buttons 24V DC are required.

Voltage monitoring

The input and output voltages of the chopper–type power supply unit are monitored by voltage comparators. If the output voltage of the chopper–type power supply unit drops below 4.75V for more than 20 µs, the signal
PF5V [2] is generated and thus a reset is triggered.

The signal PF24V [3] is generated, if the 24V DC of the button interrogation/signal lamp activation drop below 19.5V DC, because the interrogation logic does not work correctly in the presence of undervoltage.

Note:

None of the outputs (lamp activation and interrogation signals) are short–circuit–proof.

Signal lamp activation

The max. 96 signal lamps are activated in a static way, i. e. the processor treats the registers one after the other. One signal lamp is permanently allocated to each register. The connected signal lamp is connected to ground via transistors.
The flashing of the signal lamps is achieved by the cyclic treatment of the registers.

[1] Dependent on application

[2] Signal:

0V	U < 4.75V DC
5V	U > 4.75V DC → OK

[3] Signal:

0V	U < 19.5V DC
5V	U > 19.5V DC → OK

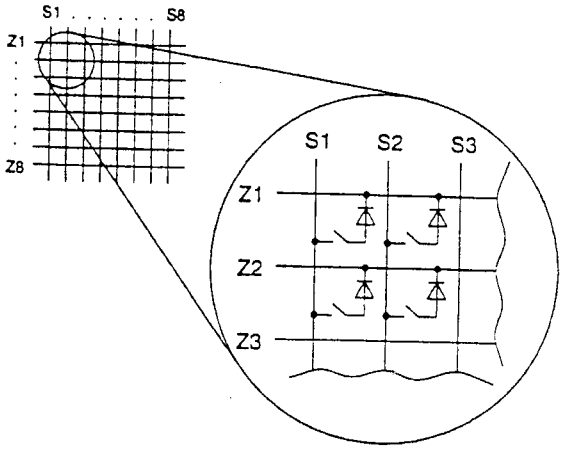


Diagram of a button matrix

Interrogation of buttons

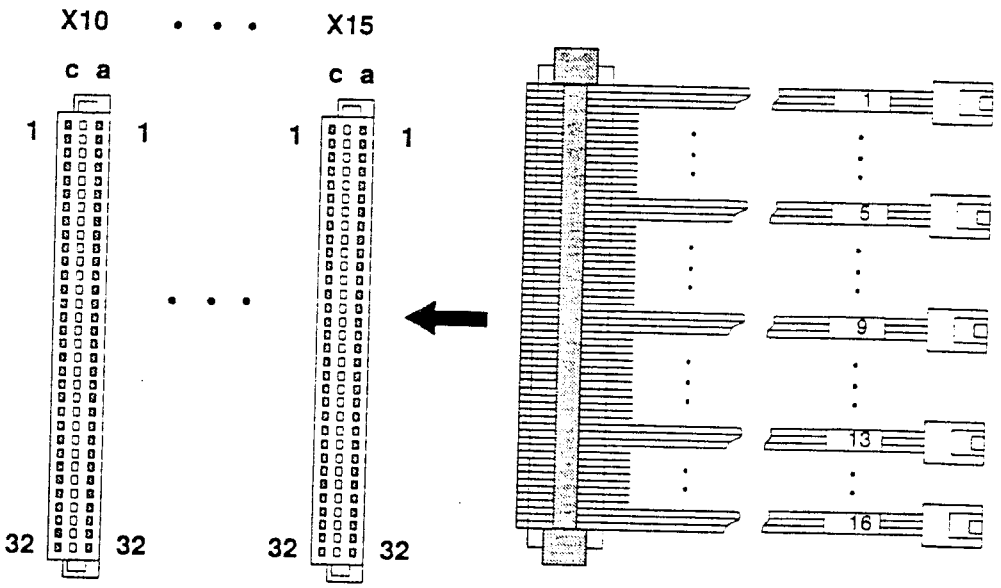
Two matrices (1 x 64 inputs, 1 x 32 inputs) are allocated to the max. 96 inputs of the illuminated pushbuttons.
The columns of the matrices are formed by the interrogation leads (S1 ... S8) and the lines by the feedback leads (Z1 ... Z8).

The microcontroller addresses the columns 1 ... 8 one after the other. Thus 24V DC is only present at one of the 8 columns at a time. In the process, the return signals (Z1 ... Z8) are read and the buttons pressed are registered.

The cyclic interrogation of the status of the buttons is repeated every 10 ms.

Pin assignment

X10 ... X15



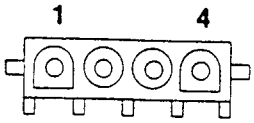
Pin bases X10 ... X15

X10 ... X15 Pin bases
Illuminated push–buttons and signal lamps

Note

For the allocation of the pin bases X10 ... X15 to the illuminated push–buttons and signal lamps of the connected control unit, see circuit diagram.

X1

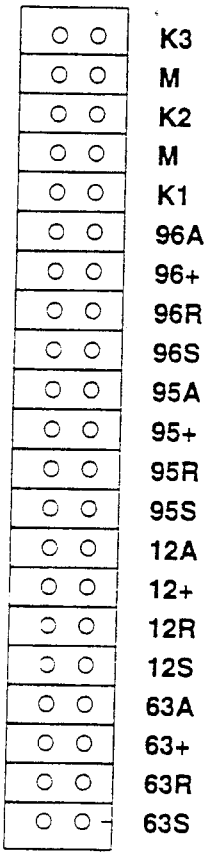


Socket base X1

X1 Socket base / power supply

Pin	Function
1	24V DC
2	24V DC
3	⊥ 24V
4	⊥ 24V

X20



Plug–in terminals X20

X20 Plug–in terminals

Terminal designation	Function
K1 ...K3	Coding lines
M	⊥
... A	Voltage applied to outputs
... +	24V DC
... R	Return signals (return lines)
... S	Interrogation leads (scan lines)

Plug–in terminal	Function	
	ZSP	KSP
63S 63R	"Emergency stop" button	⌐ Jumper ⌙
12S 12R	Key–operated switch CPC 1 [1]	

Connections

[1] Dependent on application

Note: 19 Detects if push button is depressed for ...

1y THE SIGNAL IS REPEATED FOR 10msec THIS IS TO MAKE SURE THAT THE CPU CATCHES THIS PUSH BUTTON SIGNAL.

EAM Block Diagram
Overview

Information such as

1. flashing lights. ~~Deposit of return~~ information storeage.
2. Interface bus
3. Control bus
4. Input port
5. Under ~~current~~ comparator VOLTAGE
6. Combinational circuit 0.5 A
7. Flasher pulse for lamps
8. Reset from partner interface on ZSK
9. Interfaces
10. Interrupt on partner interface on ZSK
11. Interior switching
12. Scan memory
13. Scan driver
14. Repeat 10ms
15. Read-back return line
16. Display panel control see page 3
17. Display panel
18. Matrix option wiring
19. Data processes > 30ms input filters TI = < 1ms are acquired
20. Operation panel matrix
21. See page 2
22. Command keys
23. e.g. +/- keys 2x64 from FZT

Verkauf Technischer Service
• Elektronik Schulung •

Kompaktelektronik
Blockschaltbild EAM
Gesamtübersicht

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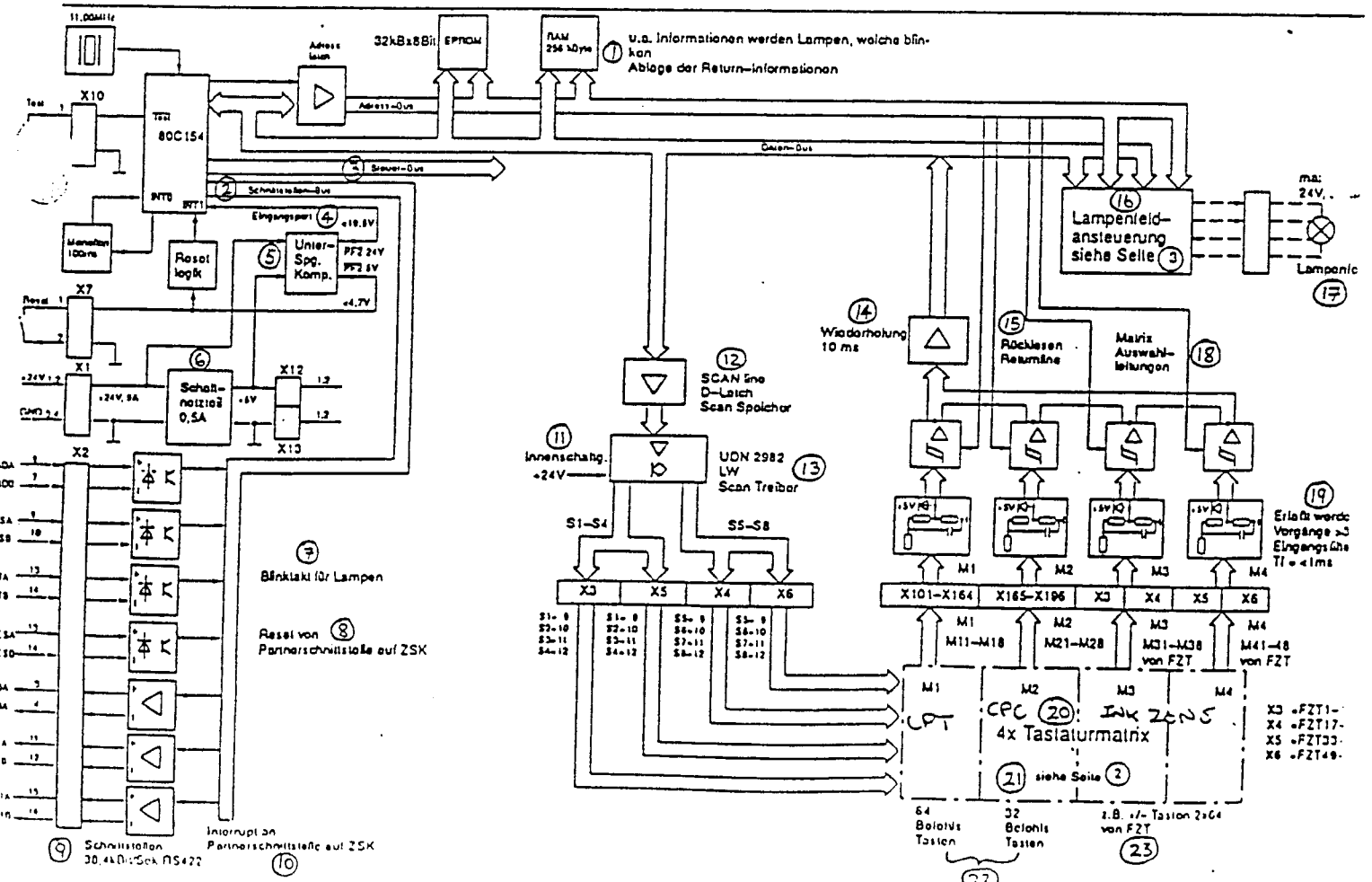
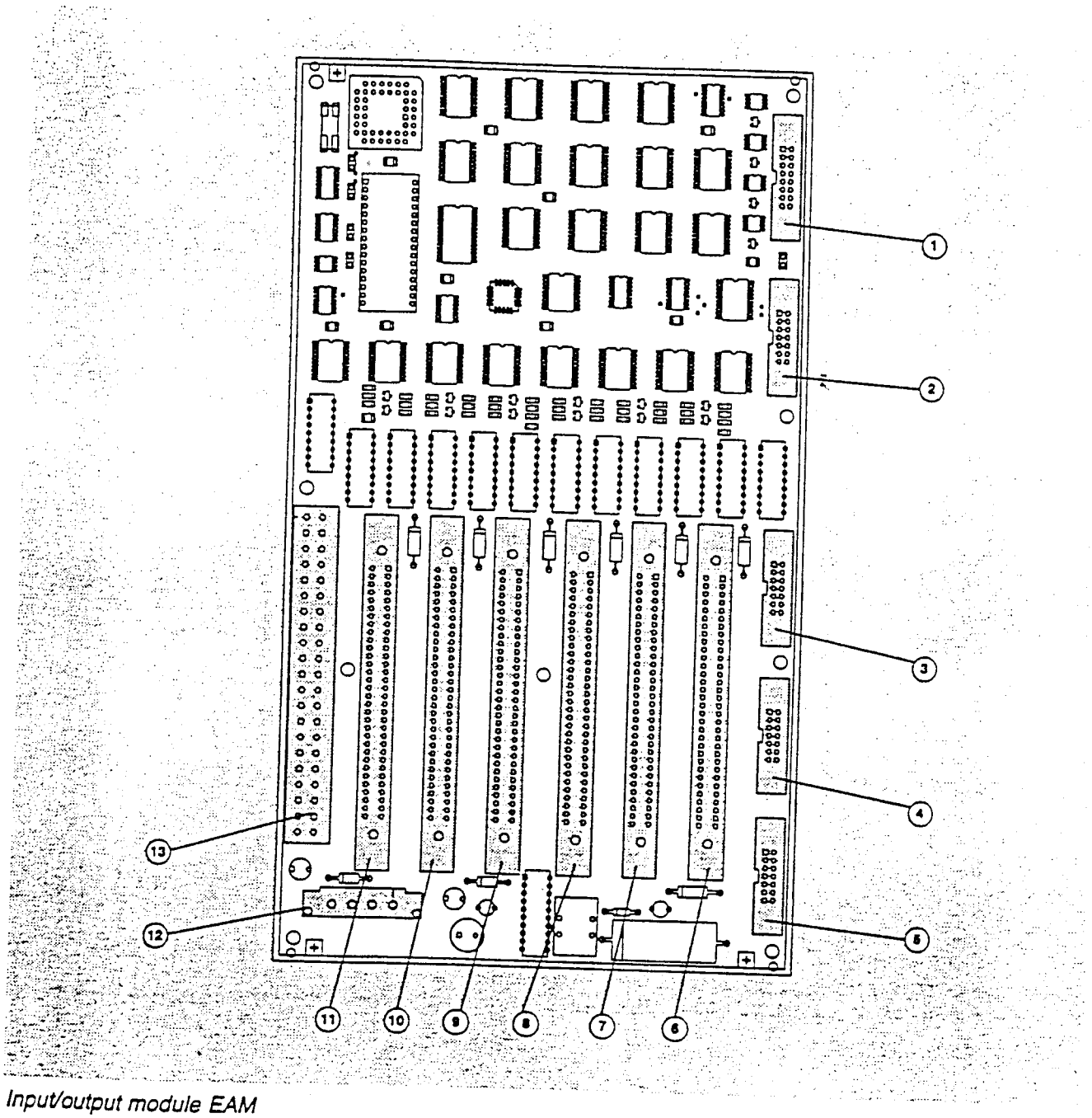


EAM input/output module

Layout



Input/output module EAM

① X2 Pin plug
serial interface ZSK/BEK/REK

② X3 Pin plug ink fountain zone push-buttons CPC 1

③ X4 Pin plug ink fountain zone push-buttons CPC 1

④ X5 Pin plug ink fountain zone push-buttons CPC 1

⑤ X6 Pin plug ink fountain zone push-buttons CPC 1

⑥ X10 Pin plug
signal lamps/illuminated push-buttons

⑦ X11 Pin plug
signal lamps/illuminated push-buttons

⑧ X12 Pin plug
signal lamps/illuminated push-buttons

⑨ X13 Pin plug
signal lamps/illuminated push-buttons

⑩ X14 Pin plug
signal lamps/illuminated push-buttons

⑪ X15 Pin plug
signal lamps/illuminated push-buttons

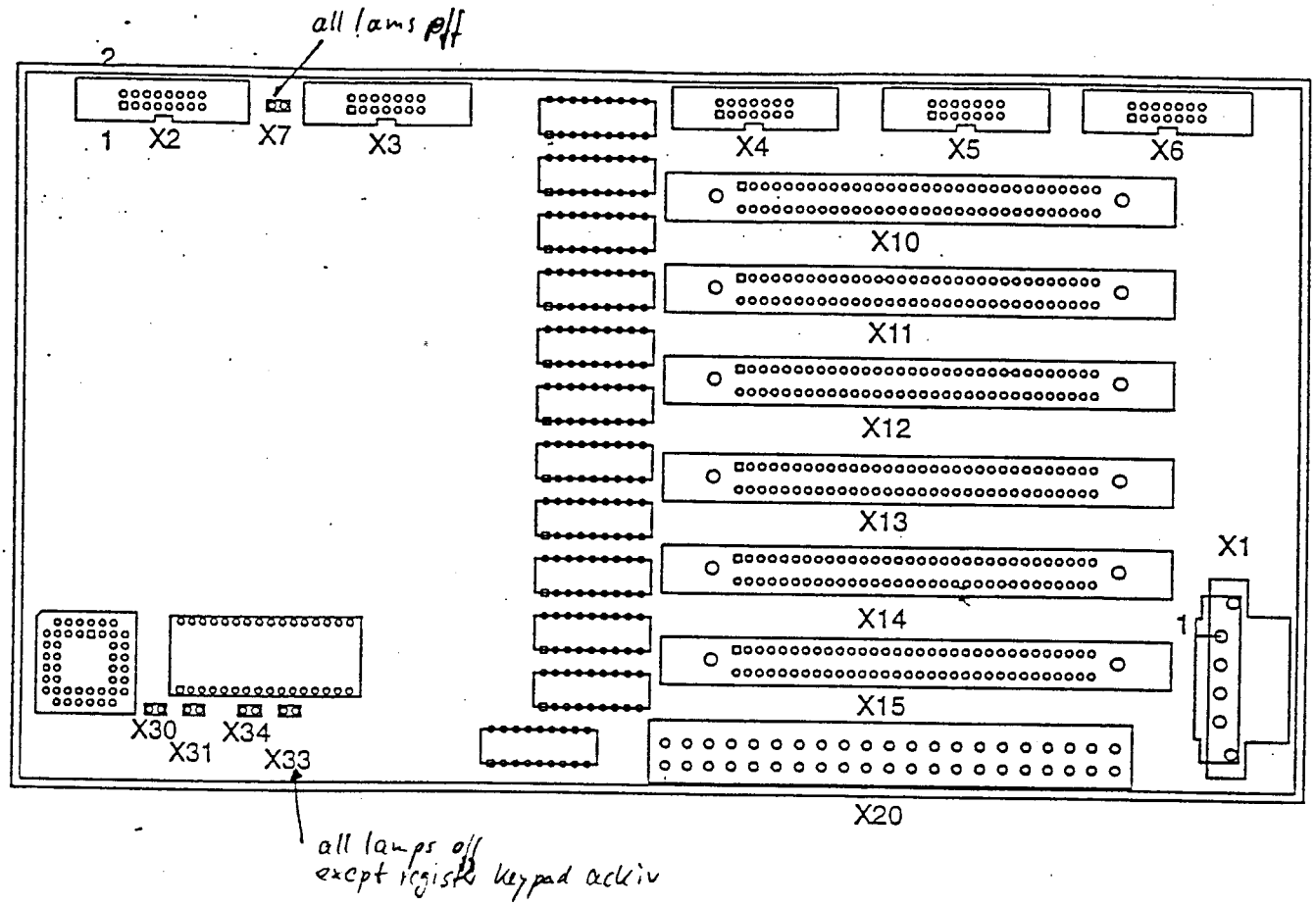
⑫ X1 Socket plug
voltage supply EAM

⑬ X20 Plug terminals Key-operated switch CPC
ZSP: Emergency stop
KSP: Bridge

Task

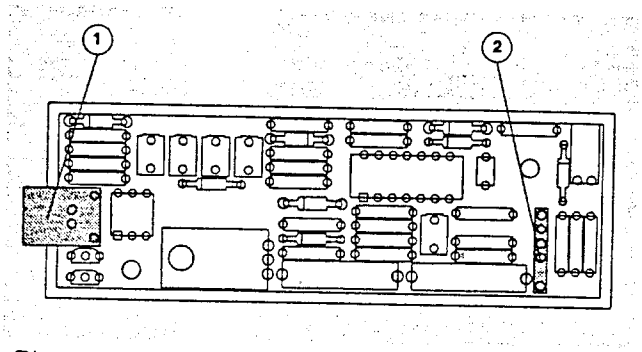
The input/output module EAM manages the illuminated push-buttons and signal lamps of a random control unit (central control panel, compact control panel, CPC 3-S plate image reader, CPC 1 control unit).
It acquires the push-button statuses and triggers the control unit signal lamps.

Steckerbestückung EAM



RSK Plug-on control board 120V

Structure



Plug-on control board RSK120

① X1 Female connector / emergency stop signal

② X3 Plug connection to GKM

Task

The plug-on control board monitors the 120V circuit. In the case of overvoltage caused by generator operation (voltage feedback through auxiliary drive),

- the overvoltage is reduced by bringing a chopper resistor into circuit (see GKM);
- an emergency stop signal is generated if the malfunction (voltage feedback) is present for a prolonged period of time.

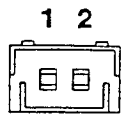
Function

If the voltage exceeds approx. 140V, the chopper resistor is brought into circuit.
If the overvoltage is present for more than 6s, the resistor is switched off and after another 4s a fault signal is generated.
This fault signal triggers an emergency stop of the press.
If the voltage exceeds approx. 180V, the emergency stop signal is generated immediately.
The signal is isolated via an optocoupler which reaches a high-resistance condition if there is a fault.

Note:
Also refer to the compact rectifier module GKM.

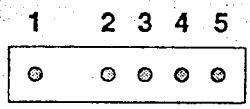
Pin assignment

X1



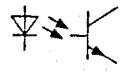
Female connector X1

X3



Male connector X3

X1 [1] Plug connection / emergency stop signal

Pin	Function	Assignment connecting cable
1		24V DC
2		Emergency stop signal

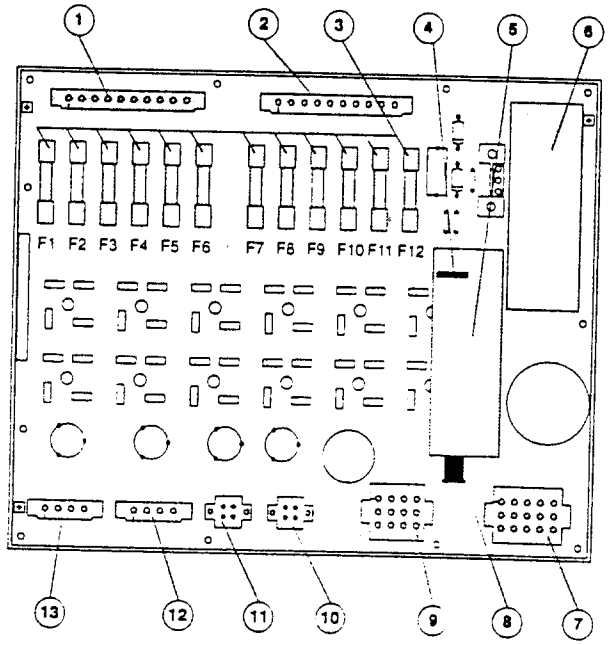
X3 Plug connection to GKM

Pin	Function
1	120V DC
2	⊥ 120V
3	Control signal (chopper transistor)
4, 5	Not used

[1] Signal is high–resistance if there is a fault

GKM Compact rectifier module

Layout



Compact rectifier module GKM

① X1 Male connector / power supply GKM

② X9 Male connector / power supply GKM

③ Fuses F1 – F12

④ X7 Female connector GKM or plug connection RSK (male connector RSK X3)

⑤ Plug–on control board 120V

⑥ Chopper resistor 33 Ω

⑦ X6 Female connector / output voltage , 120V DC circuit (approx. 127V [1])

⑧ X1 Male connector RSK (emergency stop signal)

⑨ X5 Female connector / output voltage, 48V DC circuit (approx. 52V [1])

⑩ X4 Female connector / output voltage, 24V DC circuit (approx. 28V [1])

⑪ X10 Female connector / output voltage, 24V DC circuit (approx. 38V [1])

⑫ X3 Female connector / output voltage, (not used)

⑬ X2 Female connector / output voltage, 5V DC circuit (approx. 28V [1])

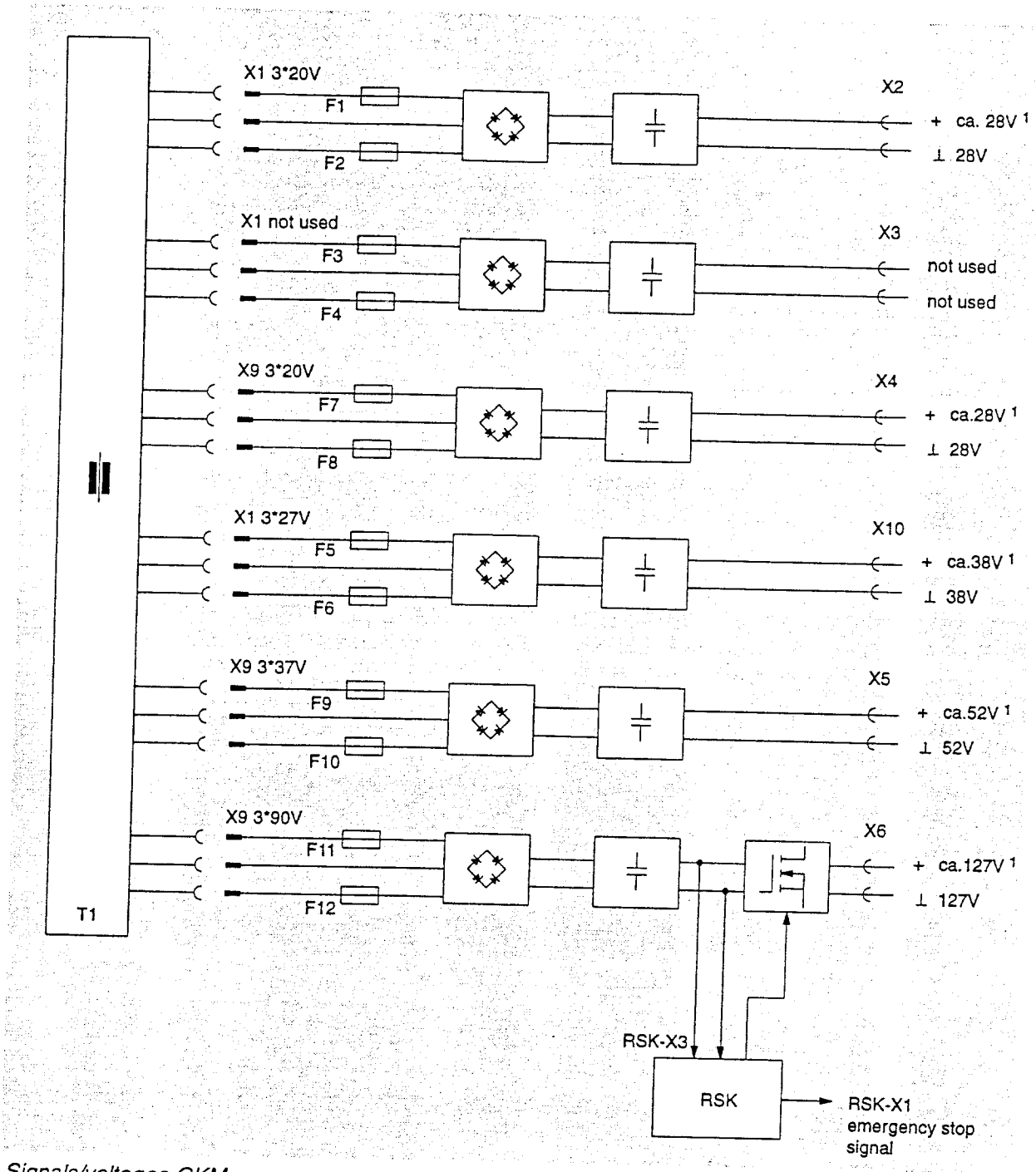
Task/function

The compact rectifier module

- rectifies different voltages of the transformer via three–phase bridge rectifiers and prevents short–time voltage dips by slight current smoothing;
- provides the following output voltages:
  - approx. 28V DC [1] for the NTM (supply voltage for electronics 5V)
  - approx. 38V DC [1] for the NTM (supply voltage 24V)
  - approx. 28V DC [1] for 24V components (e.g. supply voltage for fan of BLT)
  - 52V DC [1]
  - 127V DC [1];
- provides two–phase protection for the inputs via the fuses F1 through F12;
- protects the 120V circuit via the RSK (also refer to "Plug–on control board RSK").

[1] No–load voltage

Block diagram

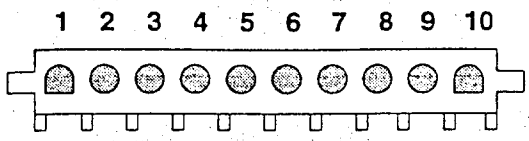


Signals/voltages GKM

[1] No-load voltage

Pin assignment

X1

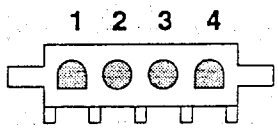


Male connector X1

X1 Power supply GKM

Pin	Function
1	not used
2	20V AC 1
3	20V AC 2
4	20V AC 3
5	not used
6	not used
7	not used
8	27V AC 10
9	27V AC 11
10	27V AC 12

X2/X3



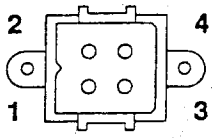
Female connector X2/X3

X2 Output voltage

Pin	Function
1, 2	+ 28V DC [1]
3, 4	ground 28V

X3 not used

X4/X10



Female connector X4/X10

X4 Output voltage

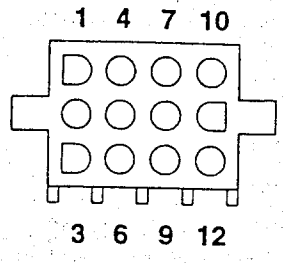
Pin	Function
1, 2	+ 28V DC [1]
3, 4	ground 28V

X10 Output voltage

Pin	Function
1, 2	+ 38V DC [1]
3, 4	ground 38V

[1] No-load voltage

X5

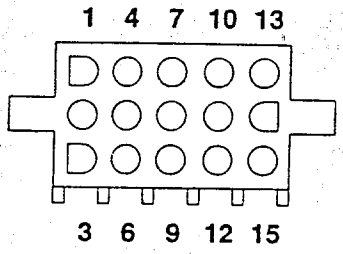


Female connector X5

X5 Output voltage

Pin	Function
1, 2, 3, 4, 5, 6	+ 48V DC (approx. 52V [1])
7, 8, 9, 10, 11, 12	ground 48V

X6

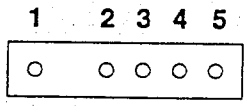


Female connector X6

X6 Output voltage

Pin	Function
1, 2, 3, 4, 5, 6, 7	+ 120V DC (approx. 127V [1])
8	not used
9, 10, 11, 12	ground 120V

X7

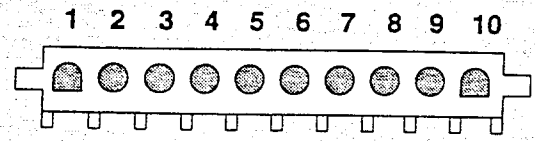


Female connector X7

X7 GKM (or connector RSK X3)

Pin	Function
1	+ 120V DC (approx. 127V [1])
2	ground 120V
3	signal
4, 5	not used

X9

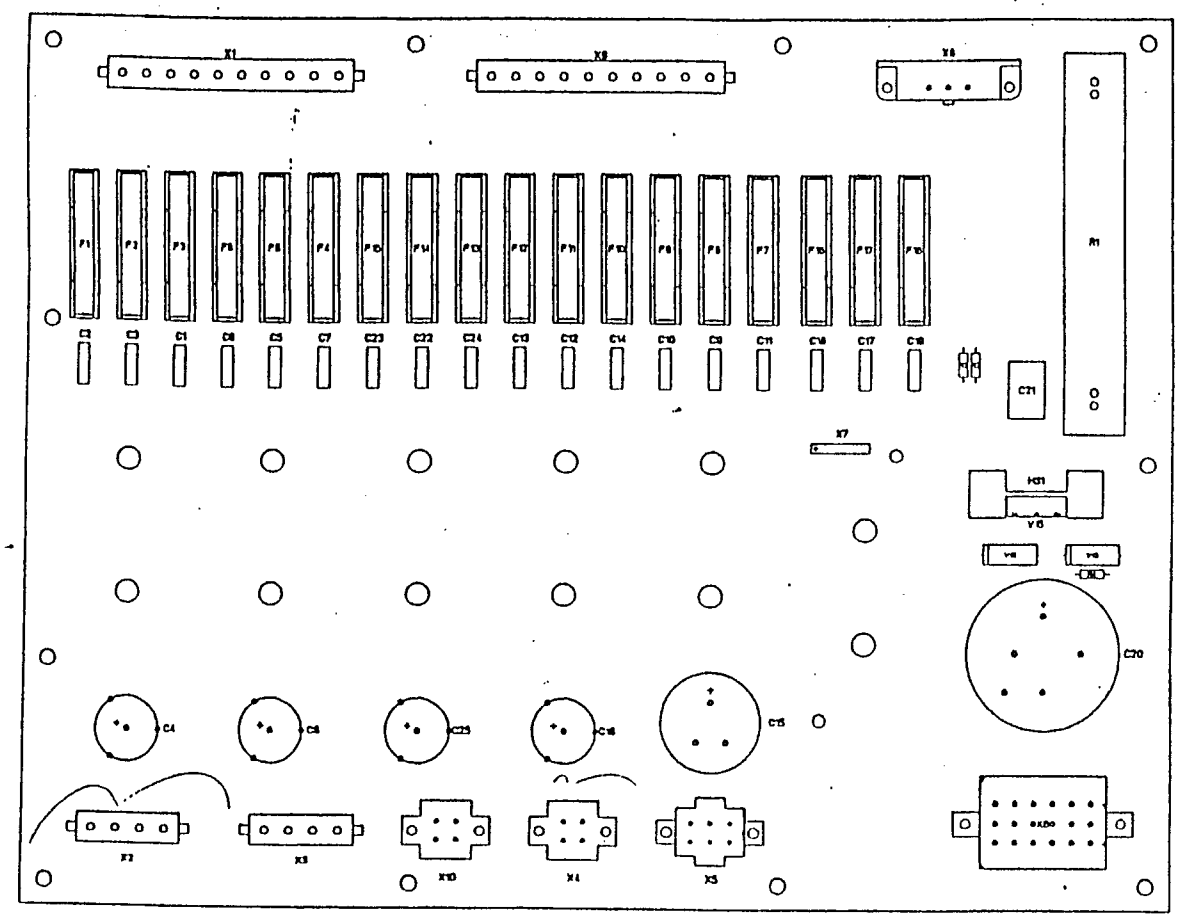


Male connector X9

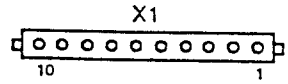
X9 Power supply GKM

Pin	Function
1	20V AC 7
2	20V AC 8
3	20V AC 9
4	37V AC 1
5	37V AC 2
6	37V AC 3
7	90V AC 1
8	90V AC 2
9	90V AC 3
10	not used

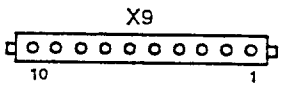
[1] No-load voltage


X1
X9
X6
X7
X11
V6
C20
C5
X2
X3
X10
X4
X5

Eingangsspannung vom Trafo zum GKM

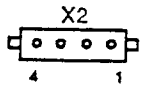


Stecker-bezeichnung	Farbe	Funktion	Kenn-zeichen	Zielort Trafo
X1/1				
X1/2	rt	Spannungsversorgung 20 V~	20/1	X6/A2
X1/3	rt	Spannungsversorgung 20 V~	20/2	X6/B2
X1/4	rt	Spannungsversorgung 20 V~	20/3	X6/C2
X1/5				
X1/6				
X1/7				
X1/8	rt	Spannungsversorgung 27 V~	27/1	X6/A3
X1/9	rt	Spannungsversorgung 27 V~	27/2	X6/B3
X1/10	rt	Spannungsversorgung 27 V~	27/3	X6/C3

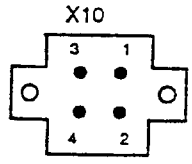


Stecker-bezeichnung	Farbe	Funktion	Kenn-zeichen	Zielort Trafo
X9/1	rt	Spannungsversorgung 17 V~	17/1	X6/A1
X9/2	rt	Spannungsversorgung 17 V~	17/2	X6/B1
X9/3	rt	Spannungsversorgung 17 V~	17/3	X6/C1
X9/4	rt	Spannungsversorgung 37 V~	37/1	X6/A4
X9/5	rt	Spannungsversorgung 37 V~	37/2	X6/B4
X9/6	rt	Spannungsversorgung 37 V~	37/3	X6/C4
X9/7				
X9/8				
X9/9				
X9/10	gr/ge	Schutzleiter	PE	X6/PE

Ausgangsspannung vom GKM zu den NTM 1/2

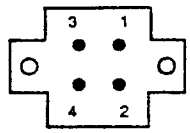


Stecker-bezeichnung	Farbe	Funktion	Kenn-zeichen	Zielort
X2/1	bl	Spannungsversorgung 28 V/1		NTM1 X3/1
X2/2	bl	Spannungsversorgung 28 V/2		NTM2 X3/1
X2/3	bl	Spannungsversorgung 28 V/1		NTM1 X3/2
X2/4	bl	Spannungsversorgung 28 V/2		NTM2 X3/2



Stecker-bezeichnung	Farbe	Funktion	Kenn-zeichen	Zielort
X10/1	bl	Spannungsversorgung 38 V/1		NTM1 X3/3
X10/2	bl	Spannungsversorgung 38 V/2		NTM2 X3/3
X10/3	bl	Spannungsversorgung 38 V/1		NTM1 X3/4
X10/4	bl	Spannungsversorgung 38 V/2		NTM2 X3/4

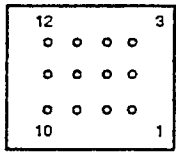
X4



Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X4/1	bl	Spannungsversorgung +24 V	+9	15X2:+9
X4/2				
X4/3	bl	Spannungsversorgung Gnd 24 V	–9	15X2:–9
X4/4				

Ausgangsspannung vom GKM zum LTM100

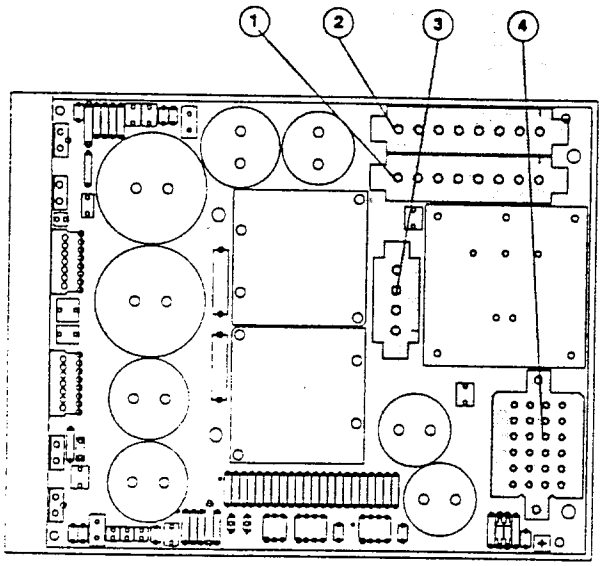
X5



Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X5/1	sw	Spannungsversorgung +48 V	+6	15X2:+6
X5/2		frei		
X5/3		frei		
X5/4		frei		
X5/5		frei		
X5/6		frei		
X5/7	sw	Spannungsversorgung Gnd 48 V	–2	15X2:–2
X5/8		frei		
X5/9		frei		
X5/10		frei		
X5/11		frei		
X5/12		frei		

NTM Power supply module

Layout



Power supply module NTM

① X1 Female connector / power supply electronic boards and components

② X2 Female connector / power supply electronic boards and components

③ X3 Male connector / power supply NTM (from GKM [1] or GRM [1])

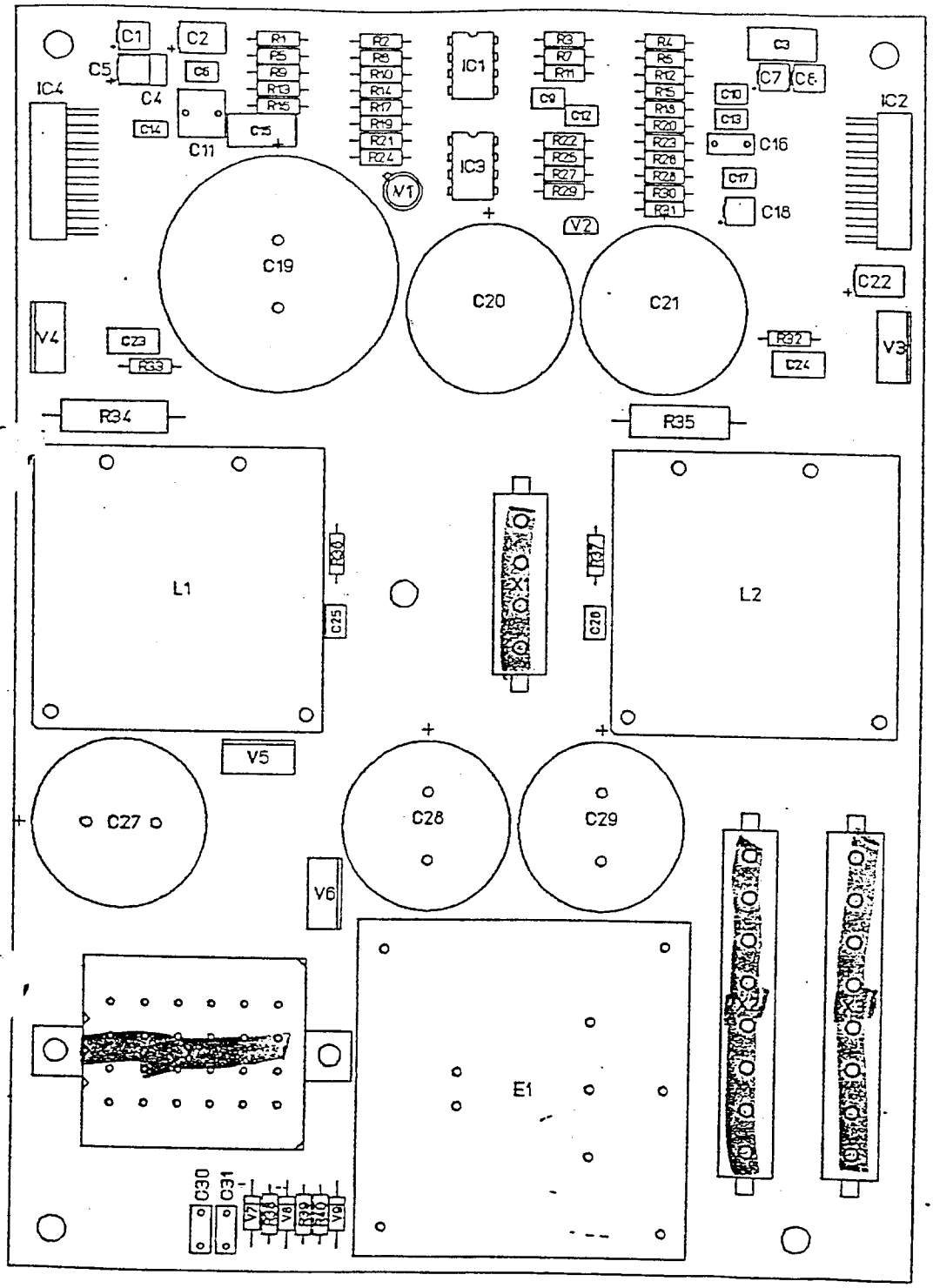
④ X4 Female connector / power supply electronic boards, components and signal lines

Task

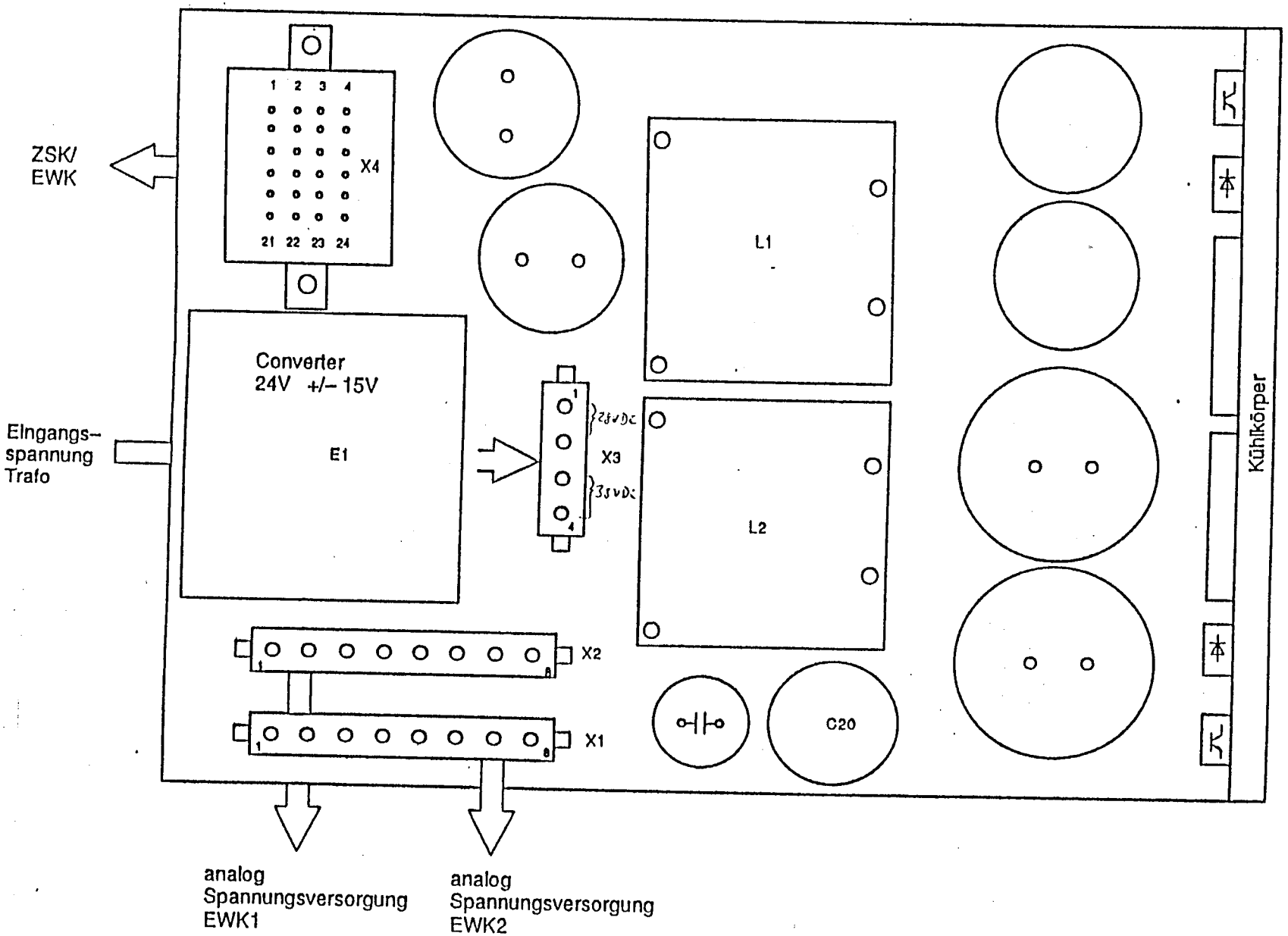
The power supply module

- generates stabilized direct voltages for the electronic boards and electric components of the press;
- monitors its input and output voltages and, in the case of undervoltage, transmits a fault signal to the ZSK;
- prevents overvoltages which might occur at the outputs by means of protective circuits.

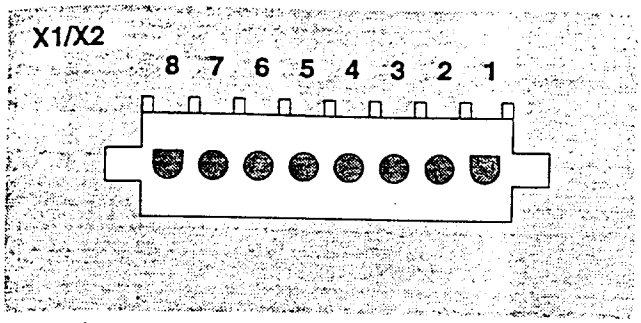
[1] Depending on the press/device



Änderungsm	
	Datu
Bearb.	22.03.9
Gepr.	22.03.9
Norm	


ZSK/
EWK
1 2 3 4
X4
21 22 23 24
Converter
24V +/– 15V
E1
Eingangs–
spannung
Trafo
L1
L2
X3
X2
X1
C20
Kühlkörper
analog
Spannungsversorgung
EWK1
analog
Spannungsversorgung
EWK2

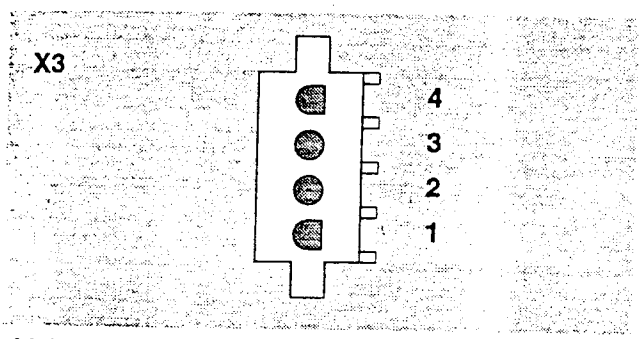
Pin assignment



Female connector X1 or X2

X1 and X2 Power supply for electronic boards and components

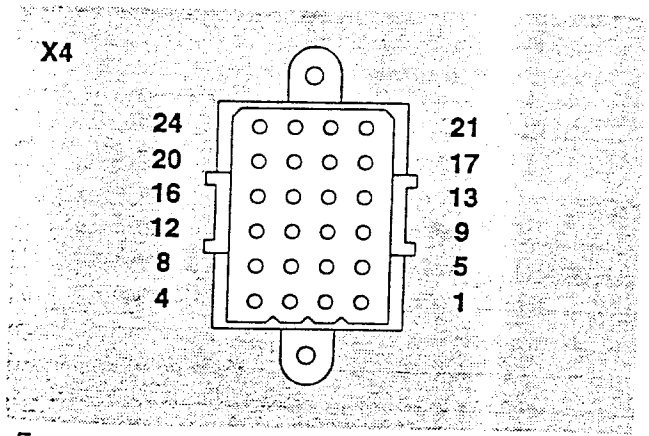
Pin	Function
1	+15V DC
2	–15V DC
3	Ground ±15V
4, 5	5V DC
6	Ground 5V
7	24V DC
8	Ground 24V



Male connector X3

X3 Power supply for NTM

Pin	Function
1	30V DC
2	Ground 30V
3	40V DC
4	Ground 40V



Female connector X4

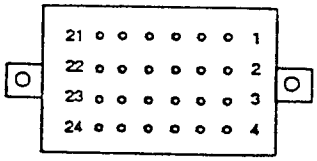
X4 Power supply for electronic boards, components and signal lines

Pin	Function
9, 13, 14, 15, 16	5V DC
17, 18, 19, 20, 24	Ground 5V
1, 2, 3, 4, 7, 8	24V DC
5, 6, 10, 11, 12	Ground 24V
21	PFI/$U_{I/O}$ 5V [1]
22	$U_{I/O}$ 24V [2]
23	Not used

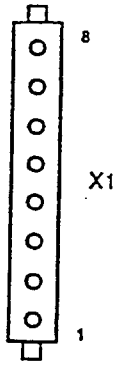
[1] Signal is: 0V | U < 4.9V DC or power failure
5V | U > 4.9V DC → OK

[2] Signal is: 0V | U < 21.6V DC
5V | U > 21.6V DC → OK

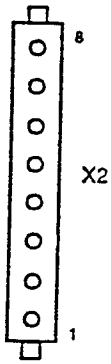
X4



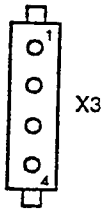
Stecker-bezeichnung	Farbe	Funktion	Kenn-zeichen	Zielort
X4/1	bl	Spannungsversorgung +24V	+3	ZSK X3:4
X4/2	bl	Spannungsversorgung +24V	+3	EWK1 X31:2
X4/3	bl	Spannungsversorgung +24V	+3	EWK1 X31:3
X4/4	bl	Spannungsversorgung +24V	+3	EWK2 X31:2
X4/5	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/6	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/7	bl	Spannungsversorgung +24V	+3	EWK2 X31:3
X4/8	bl	Spannungsversorgung +24V	+3	15X2:+3
X4/9	bl	Spannungsversorgung +5V		ZSK X3:2
X4/10	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/11				
X4/12				
X4/13	bl	Spannungsversorgung +5V		EWK1 X31:4
X4/14	bl	Spannungsversorgung +5V		EWK1 X31:5
X4/15	bl	Spannungsversorgung +5V		EWK2 X31:4
X4/16	bl	Spannungsversorgung +5V		EWK2 X31:5
X4/17	bl	Spannungsversorgung GND/5V		ZSK X3:3
X4/18	bl	Spannungsversorgung GND/5V		EWK1 X31:9
X4/19	bl	Spannungsversorgung GND/5V		EWK1 X31:10
X4/20	bl	Spannungsversorgung GND/5V		EWK2 X31:9
X4/21	bl	/PF1		ZSK X3:1
X4/22		Reserve (VUIO 24)		
X4/23		Reserve		
X4/24	bl	Spannungsversorgung GND/5V		EWK2 X31:10



Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X1/1	bl	Spannungsvers. +15V		EWK1 X31:1
X1/2	bl	Spannungsvers. –15V		EWK1 X31:6
X1/3	bl	Spannungsvers. AGND		EWK1 X31:8
X1/4				
X1/5	bl	Spannungsvers. +5V	+5	15X2:+5
X1/6				
X1/7				
X1/8				

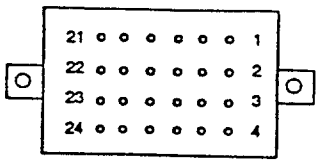


Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X2/1	bl	Spannungsvers. +15V		EWK2 X31:1
X2/2	bl	Spannungsvers. –15V		EWK2 X31:6
X2/3	bl	Spannungsvers. AGND		EWK2 X31:8
X2/4				
X2/5	bl	Spannungsvers. +5V	SVM X5:2	
X2/6	bl	Spannungsvers. GND/5V	SVM X5:3	
X2/7				
X2/8				



Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X3/1	bl	Spannungsvers. 28V		GKM X2:1
X3/2	bl	Spannungsvers. 28V		GKM X2:3
X3/3	bl	Spannungsvers. 38V		GKM X10:1
X3/4	bl	Spannungsvers. 38V		GKM X10:3

X4



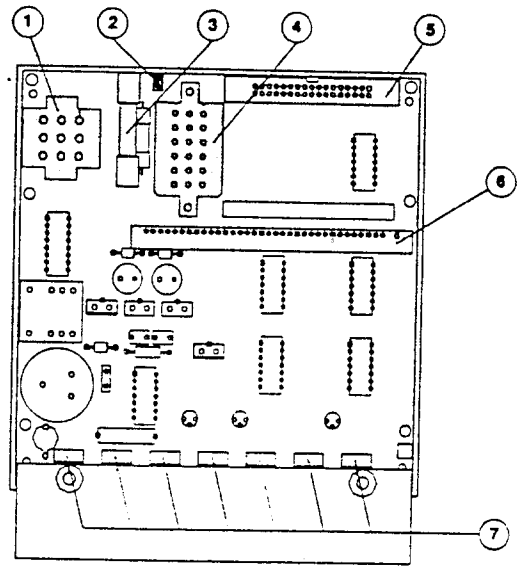
Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X4/1	bl	Spannungsversorgung +24V	+1	15X2:+1
X4/2	bl	Spannungsversorgung +24V	+1	15X2:+1
X4/3	bl	Spannungsversorgung +24V	+1	15X2:+1
X4/4				
X4/5	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/6	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/7				
X4/8				
X4/9				
X4/10	bl	Spannungsversorgung PGND	–1	15X2:–1
X4/11	bl			
X4/12	bl			
X4/13				
X4/14				
X4/15				
X4/16				
X4/17				
X4/18				
X4/19				
X4/20				
X4/21				
X4/22				
X4/23				
X4/24				

X3

Stecker–bezeichnung	Farbe	Funktion	Kenn–zeichen	Zielort
X3/1	bl	Spannungsvers. 28V		GKM X2:2
X3/2	bl	Spannungsvers. 28V		GKM X2:4
X3/3	bl	Spannungsvers. 38V		GKM X10:2
X3/4	bl	Spannungsvers. 38V		GKM X10:4

LTM100 Power part module

Layout



Power part module LTM100

① X3 Male connector / power supply unit LTM
② LED Overcurrent / enable signal
③ F1 Fuse / power supply LTM (48V)
④ X2 Female connector / control cable motor
⑤ X1 Male connector / data line ZSK/EWK
⑥ Auxiliary drive logic module HLM
⑦ Power stage

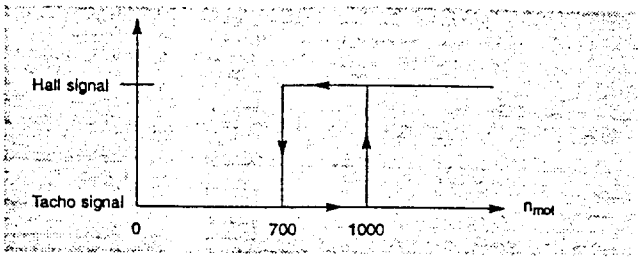
Task

The power part module

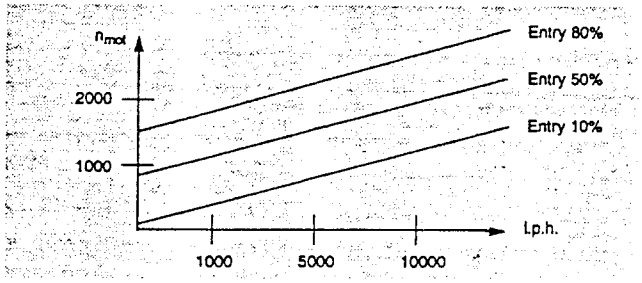
- adjusts the current in the motor windings according to defaults of the ZSK/EWK via the power stage ⑦;
- acquires and combines the Hall signals (rotor position)) from the motor for switching (commutation logic on the HLM ⑥) the power transistors and passes the Hall signals to the EWK/ZSK for determination of the speed;
- acquires the tacho signals [1] and passes them to the EWK/ZSK;
- acquires the code resistance of the motor and its own code resistance;
- determines the temperature [1] of the motor and passes a signal to the ZSK/EWK if the temperature is critical;
- switches the motor brake [1];
- monitors the motor current and passes a signal to the ZSK/EWK if there is undervoltage or overcurrent;
- acquires the signal "Governor foot/clock pulse delivery pile" [1] and passes it on to the ZSK/EWK;
- generates the voltages for its own electronics from the 48V supply voltage via its own power supply unit.

[1] Application–dependent

Function



Switching between tacho and Hall signals for speed evaluation



Examples of characteristic curves

Determination of speed

The speed is determined either by means of tacho or Hall signals:
If the speed is less than 1000 1/min, the tacho signals are used for speed monitoring. If the speed is more than 1000 1/min, the Hall signals are used. Switching between tacho and Hall signals is effected by the software.
If the speed drops below 700 1/min (hysteresis), the software switches back to the tacho signals.

Preselecting the speed

Via the CPTRONIC keyboard the speed of the water pan roller motor can be preselected within a range between 0% and 99%. On the basis of this entry, the current setpoint for the motor is determined. If the printing speed of the press changes, the speed of the water pan roller motor changes automatically according to a certain characteristic curve.

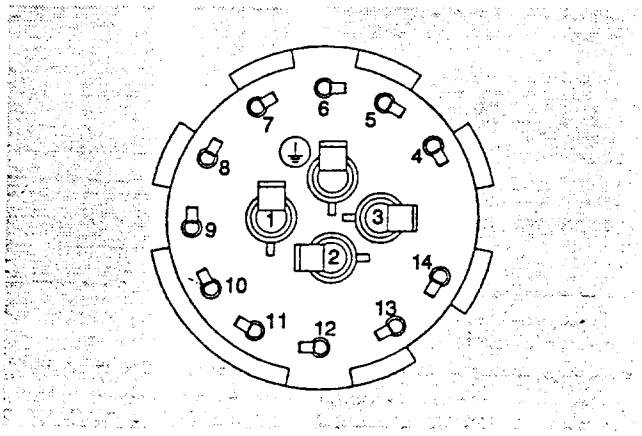
Components

Technical data

Motor data

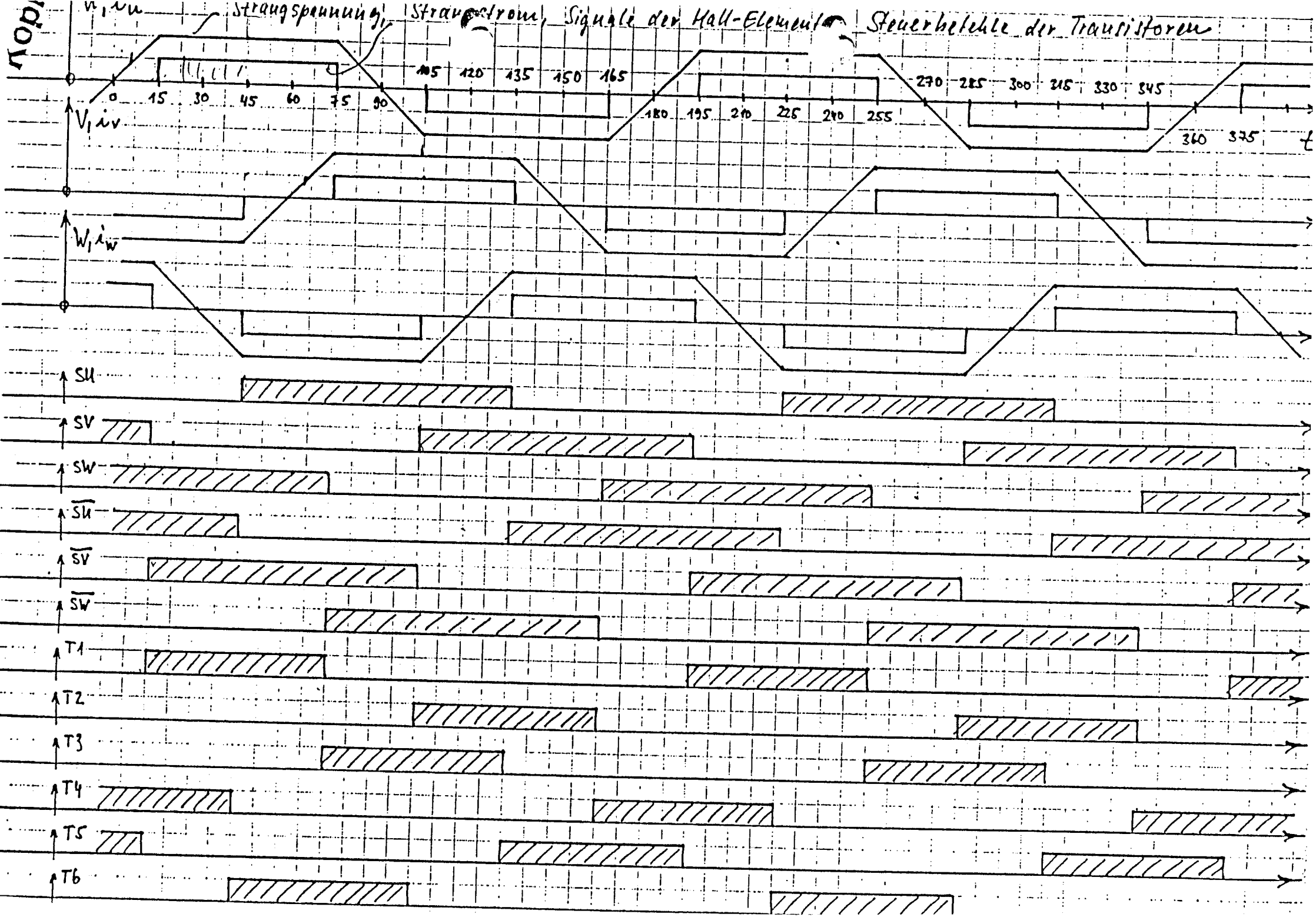
- U = 120V DC
- R_{code} = 56KΩ

Pin assignment

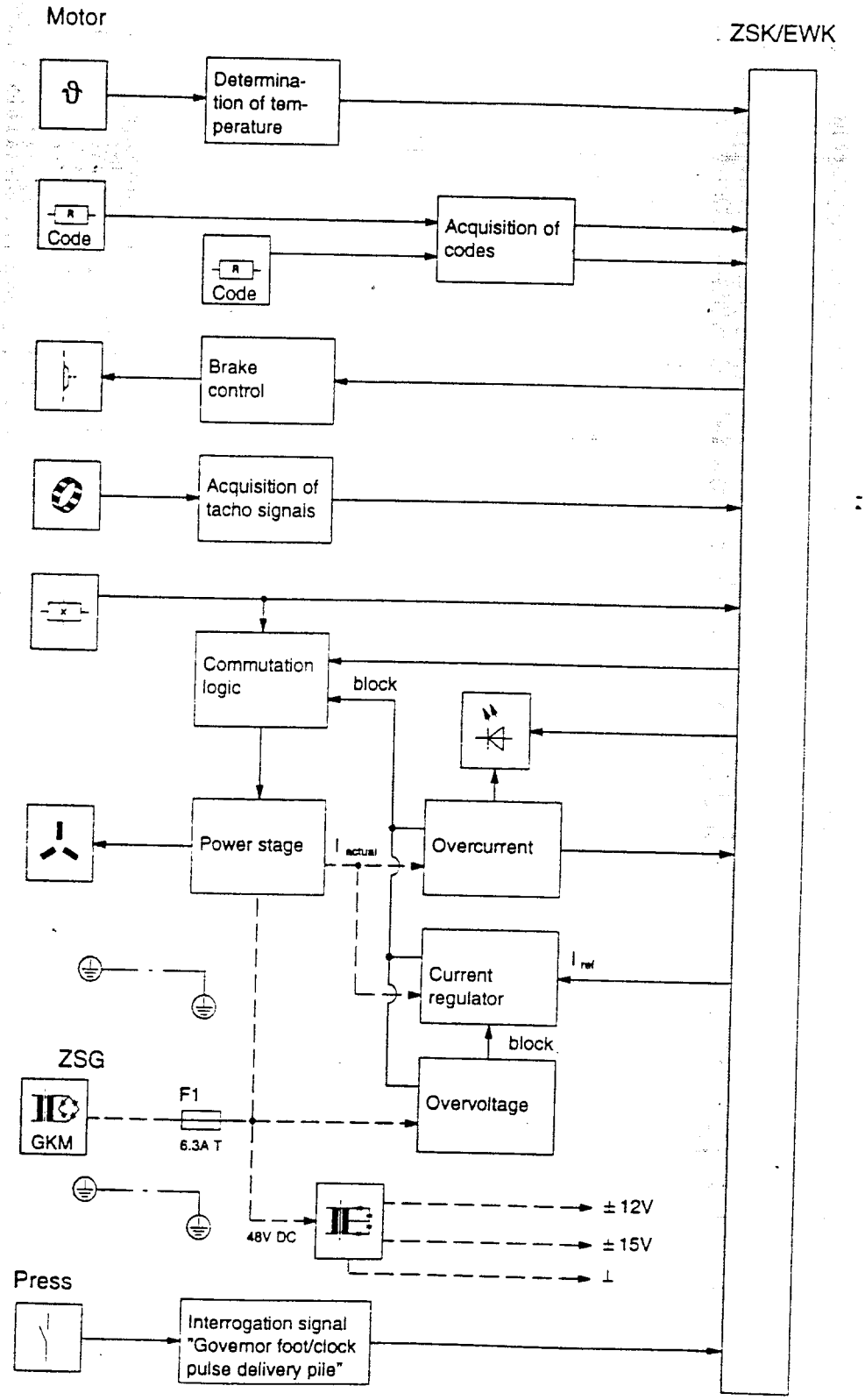


Plug of water pan roller motor

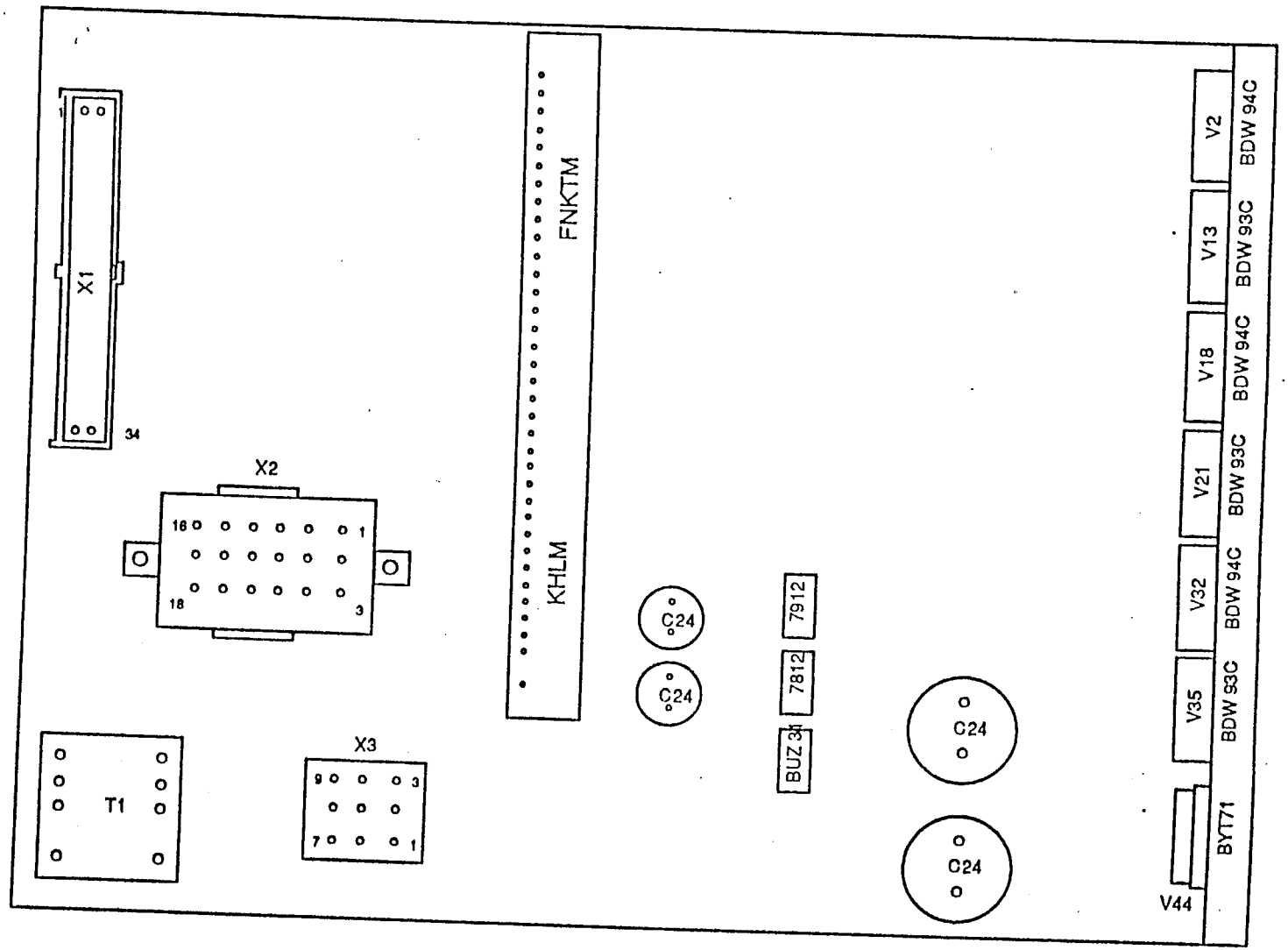
Pin	Function
1	Winding U
2	Winding V
3	Winding W
4	Hall signal C
5	Tacho signal 1
6	Hall signal B
7	15V DC supply voltage motor electronics
8	Hall signal A
9	Ground 15V
11	Code resistance
⏚	PE conductor
10, 12, 13, 14	Not used


Strangspannung
Strangstrom
Signale der Hall-Elemente
Steuerbefehle der Transistoren
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
225
240
255
270
285
300
315
330
345
360
375
t
U
V
W
SU
SV
SW
$\overline{SU}$
$\overline{SV}$
$\overline{SW}$
T1
T2
T3
T4
T5
T6

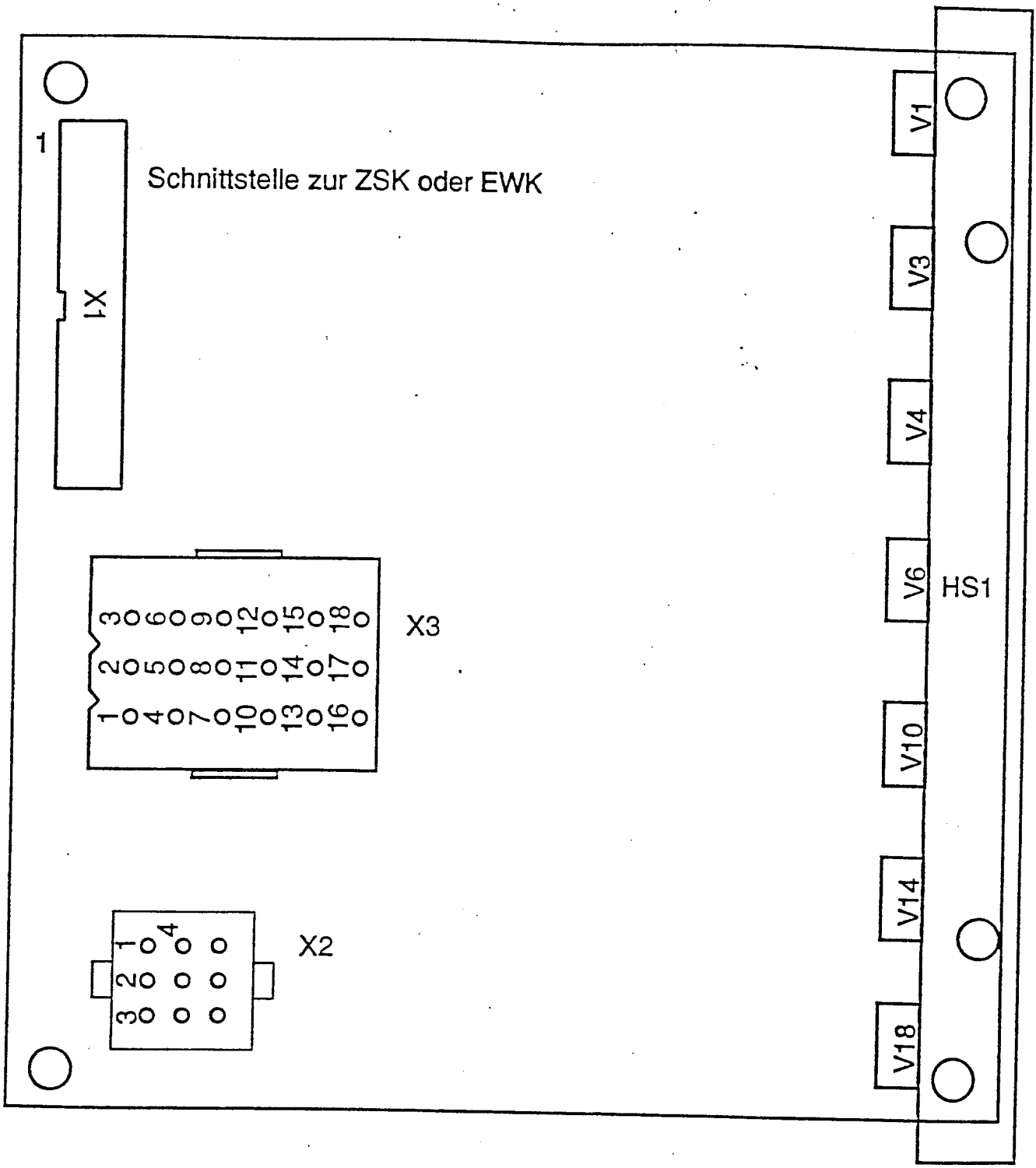
Block diagram



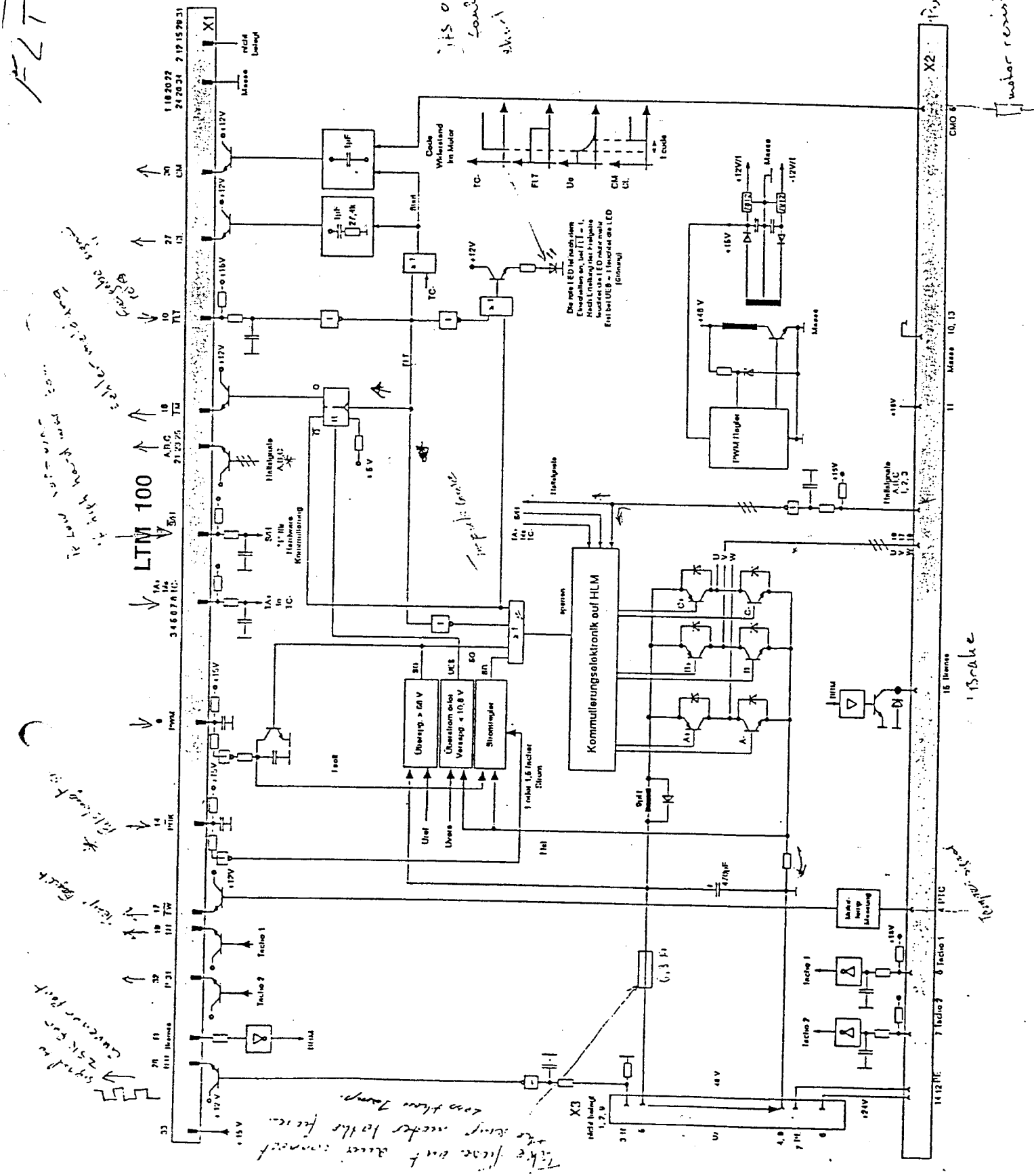
Signals to and from the LTM100


X1
34
X2
16
1
18
3
FNKTM
KHLM
C24
C24
7912
7812
BUZ 34
C24
C24
X3
9
3
7
1
T1
V2
BDW 94C
V13
BDW 93C
V18
BDW 94C
V21
BDW 93C
V32
BDW 94C
V35
BDW 93C
BYT71
V44

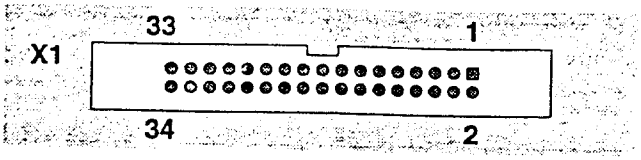
Steckerbestückung LTM 100



Blockschaltbild LTM 100

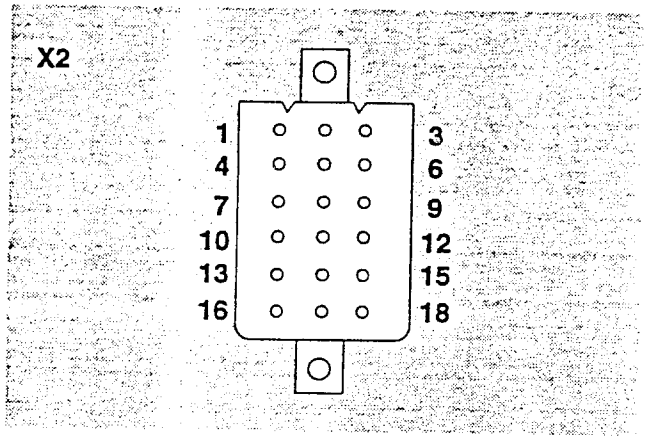


Pin assignment



Male connector X1

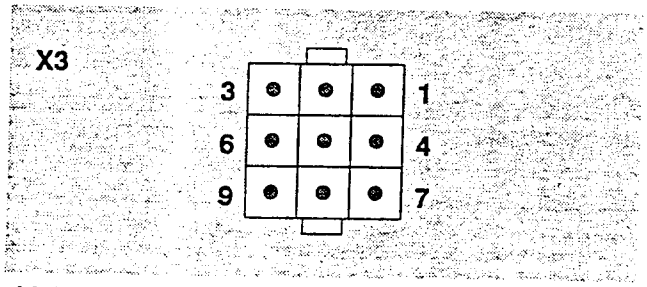
X1 Data line to ZSK or EWK



Female connector X2

X2 Control cable to motor

Pin	Function
1	Hall signal A
2	Hall signal B
3	Hall signal C
4	Determination of temperature
5	Code resistance
6	Tacho signal 1 [1]
7	Tacho signal 2 [1]
8, 9	Not used
10, 13	Ground 15V
11	15V DC supply voltage / motor electronics
12	⏚
14	24V DC supply voltage / brake
15	Brake [1]
16	Winding W
17	Winding V
18	Winding U



Male connector X3

X3 Power supply/control cable

Pin	Function
1, 2, 9	Not used
3	Interrogation signal governor foot [1]/pulse delivery pile [1]
4	Ground 24V
5	48V DC
6	24V DC
7	⏚
8	Ground 48V

[1] Application-dependent

Signals used for dampening- and suction drum motor

Hall signals:

DA X - rotor position hall 1
DC X - rotor position hall 2
DE X - rotor position hall 3

TA X - high = momentum braking, low = momentum driving
PW X - pulsing signal = speed reference value,
a static 0 = current limitation reached.

NOTE:- BY USING THE TA+A + PWA signals you can easily monitor whether the motor power part is driving or Braking + Whether current limitation has been reached.

PWA = 0 = Current limit has been reached
= is a pulse signal which gives the speed value to the I controller

The speed value is obtained by comparing the actual speed with the reference speed on the µP on HAK.

The FMA signal will never Switch off for Overcurrent because the µp will catch overcurrent & STOP pulsing PWA (set to low) before FMA is set.

NOTE:- The speed of the motor is more important to be constant rather then the current which can vary on a steady speed.

☞LTM 100/300 RSC-BKK, Futterlieb

Init test / code check

---Pin10 = /FLT, release powerpart, high

---Pin08 = TC-, low pulse (trigger code resistor check)

---Pin30 = CM, code resistor motor low pulse (pulse - with proportional to res. value)

---Pin27 = CL, code resistor powerp. low pulse (pulse - with proportional to res. value)

After Init test, when Motor was not started

---Pin18 = /FM, error message, low

---Pin17 = /FW, error warning, high

After Init test, when motor was at least once started and then stopped

---Pin18 = /FM, error message, high, it will only turn low again, if an over current is sensed or when the 12VDC on the LTM100 drops lower then 10.8VDC. Subsequently the /FLT will then disable the powerpart.

---Pin17 = FW, error warning high, it would turn low if we would assemble motor a PTC temp. resistor.

Motor starts in the correct revolving direction with the following signals

---Pin 10 = /FLT, low, powerpart enabled

---Pin 03 = TA+ low = revolving direction clockwise, high = anticlockw.

---Pin 13 = /SH high, hardware commutation

---Pin 09 = PWM low pulses 2%-100% pulse duration (low = maximum current)

If the hall patterns confirm the correct revolving direction and /FM and /FW do not indicate a fault, then the motor speeds up. Invalid hallpaterns (all low or all high) will disable the commutation logic and the motor stopps. If one hall signal is missing but the hallpaterns are still valid it may start revolving in the wrong direction. If one hall signal is missing but the motor start with valid hallpaterns it will cause speed fluctuations. The tacho signal DT is used to determine the speed below 1000 rpm. If it is missing it will speed up with the maximum.

If the momentum the motor has to drive is too high, the motor will reach overcurrent and is stopped by the disabled commutation logic.

Auxiliary drive interface, valid for current controlled motors & hardware commutation

LTM100/300 X1	**BLA_IC**	**Used**	
Pin 01=GND			
02=CL2	CTTK	n	code resistor TTK pulse duration output
03=/TA+	TR1	y	TA+ transistor signal = revolving direction
04=/TA-	TR2	n	TA- transistor signal
05=/TB+	TR3	n	TB+ transistor signal
06=/TB-	TR4	n	TB- transistor signal
07=/TC+	TR5	n	TC+ transistor signal
08=/TC-	TR6	y	TC- transistor signal = triggers INIT code test
09=/PWM	PWMI	y	Pulse with modulated s.= current setpoint v.
10=/FLT	FRGI	y	enable current controlled powerpart
11=/BRM	BR	y	brake release signal
12=WU	WUCLO	n	low/high speed winding signal
13=/SH	SH	y	software / hardware commutation
14=PGK	PGK	n	power increased as of 50%
15=nc			
16=nc			
17=/FW	TEMP	y	temperature warning LTM 100, 12V low STM
18=/FM	FREK2	y	temperature warning STM, 12v low/overc. LTM
19=DT	TACHO_A	y	tacho A
20=nc			
21=HALL_A	HALLA	y	hall A
22=nc			
23=HALL_B	HALLB	y	hall B
24=GND		y	
25=HALL_C	HALLC	y	hall C
26=GND		y	
27=CL	CSMK	y	code resistor powerpart pulse duration output
28=TF	USK1	y	govenor foot signal (24V to 12V converted)
29=CM2	CM1	n	code resistor M1 only BLT
30=CM	CM0	y	code resistor M0 pulse duration output
31=FG	NPIN	n	maximum current message, not used
32=TACHOB	TACHOB	y	tacho B
33=+15VDC		y	
34=GND		y	

1 Ground (M5HA)

2 CL2 code power part 2

3,4,5,6,7,8 TA+-,TB+-,TC+- Tramsistor basis signal

9 PWM pulse width modulated current reference signal

10 /FLT power part enable

11 /BRM brake

12 WU switch over to other windings (three phase motors) high-u.d./puls u.d.

13 SH software or hardware commutation

14 PGK signal to switch over from permanent power to higher power (only for a short time)

15 RES_A0 not used

16 RES_A1 not used

17 /FW malfunction warning TEMP + CURRENT

18 /FM malfunction message /

19 DT tacho

20 RES_A2 not used

21 DA Hall signal A

22 RES_A3 not used

23 DC Hall signal B

24 Ground (M5HA)

25 DE Hall sensor C

26 Ground (M5HA)

27 CL code power part

28 TF

29 CM2 code motor 2

30 CM code motor

31 FG maximum error value

32 TACHOB second tacho

33 not used (+15V on LTM)

34 CG Ground of power part

Hardware commutation

RSG-Bangkok, Futterku

Hall sequence — Transistor sequence

clockwise revolving direction

Hall			Transistor					
A	B	C	TA+	TA−	TB+	TB−	TC+	TC−
0	1	0	1	0	0	1	0	0
0	1	1	1	0	0	0	0	1
0	0	1	0	0	1	0	0	1
1	0	1	0	1	1	0	0	0
1	0	0	0	1	0	0	1	0
1	1	0	0	0	0	1	1	0

anti clockwise revolving direction

A	B	C	TA+	TA−	TB+	TB−	TC+	TC−
0	1	0	0	1	1	0	0	0
0	1	1	0	1	0	0	1	0
0	0	1	0	0	0	1	1	0
1	0	1	1	0	0	1	0	0
1	0	0	1	0	0	0	0	1
1	1	0	0	0	1	0	0	1

Function

Determination of rotor position/commutation

The Hall sensors of the motor determine the current rotor position. The resultant Hall signals (rotor position) are passed to the LTM via the control cable.
Via different logic ICs (HLM), the signals are evaluated for switching the power stage potential–free via the auxiliary drive driver module HTM. The power stage feeds current to the windings of the drive (commutation).

Determination of speed

The motor speed is determined either by means of the tacho signals [1] or by means of the Hall signals. Both signals are transmitted to the ZSK/EWK via the LTM.
After the evaluation, the required speed is obtained from a current reference value.

Brake control [1]

The brake of the pile drive is controlled with 24V.

Code resistances [2]

A timing element (RC element) determines the code resistance of the motor and LTM . The code resistance value influences the charging and discharge current. Depending on the discharge duration, a signal is generated. Based on the duration of this signal, the ZSK/EWK carries out a plausibility check to find out whether the drive is correctly allocated to the corresponding LTM.

Current monitoring

To avoid overheating or destruction of the components in the case of an interwinding fault or other faults, current monitoring is integrated in the power part module. If there is overcurrent or a voltage dip (<10V), the power stage is blocked. The LED is lit and simultaneously a fault signal is transmitted to the ZSK/EWK.

Determination of temperature [1]

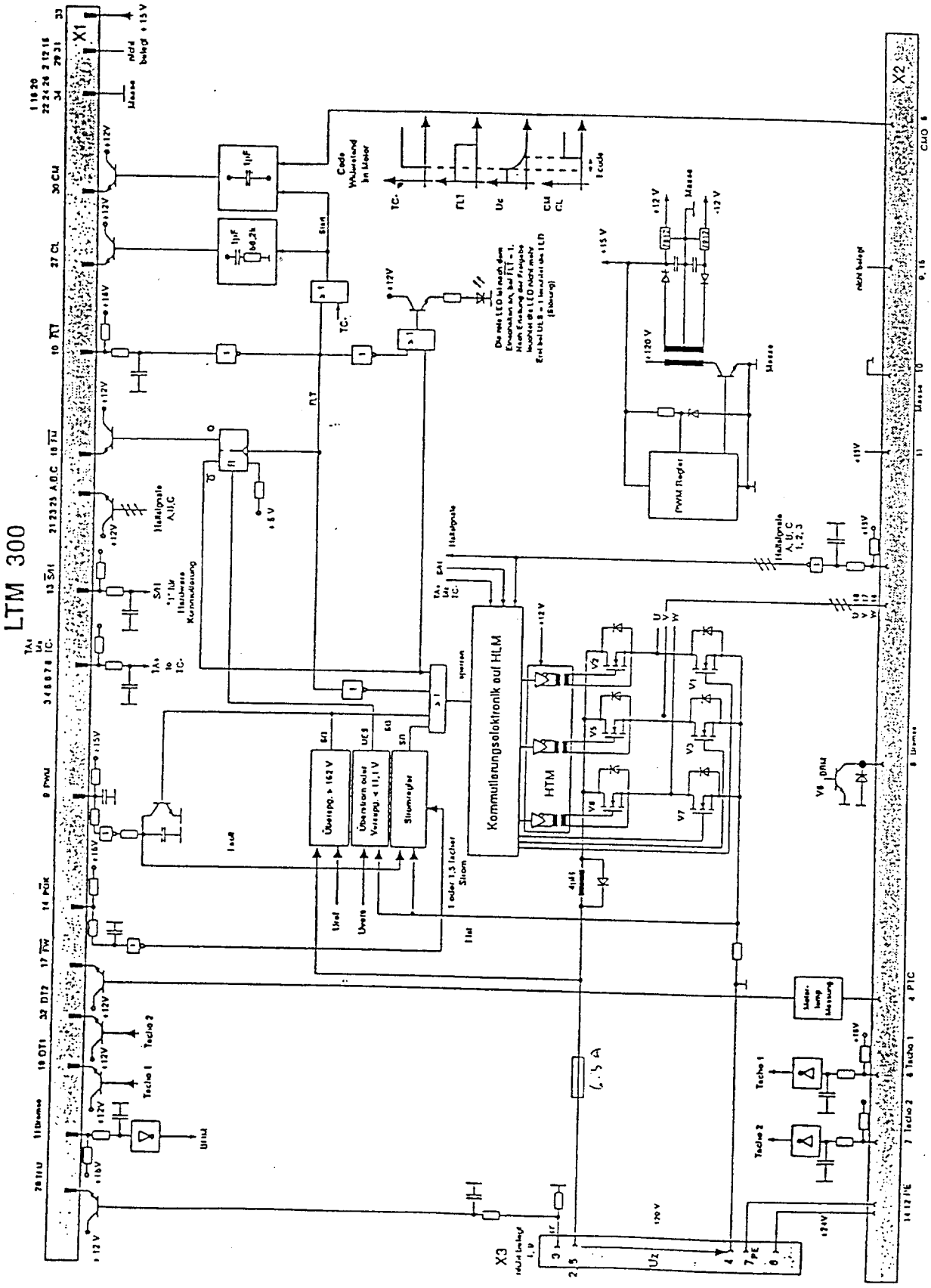
The motor temperature is determined by the LTM. In the case of overheating, a signal is transmitted to the ZSK/EWK.

Additional information

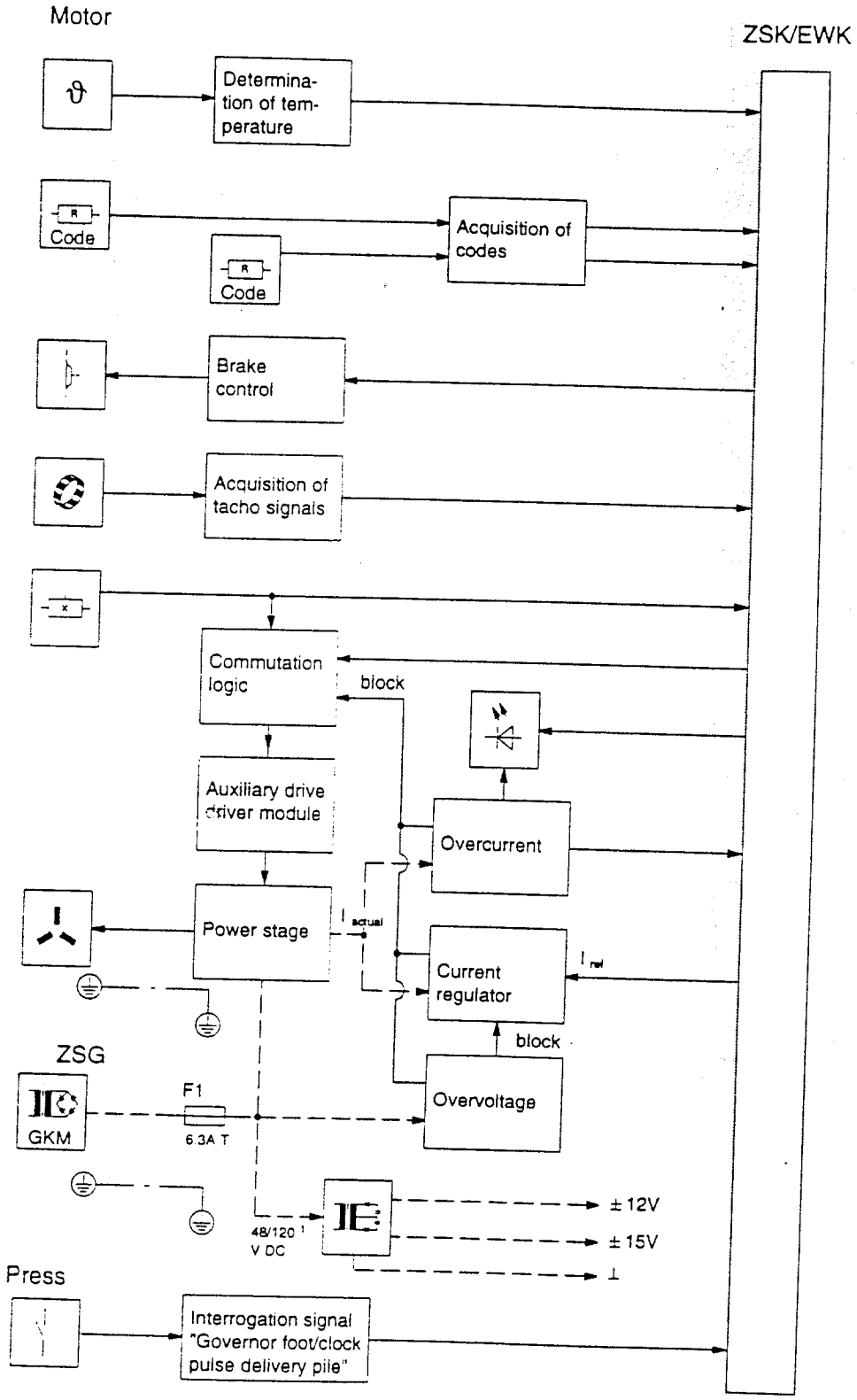
The LTM receives 48V [1] or 120V [1]. A power supply unit which supplies the internal electronics of the module is located on the LTM. Additionally, the voltages generated by the power supply unit are required for the motor electronics (Halls, R_{code}, etc.).

[1] Application–dependent
[2] LTM300, R_{code}=56KΩ, code no.:8

Blockschaltbild LTM 300



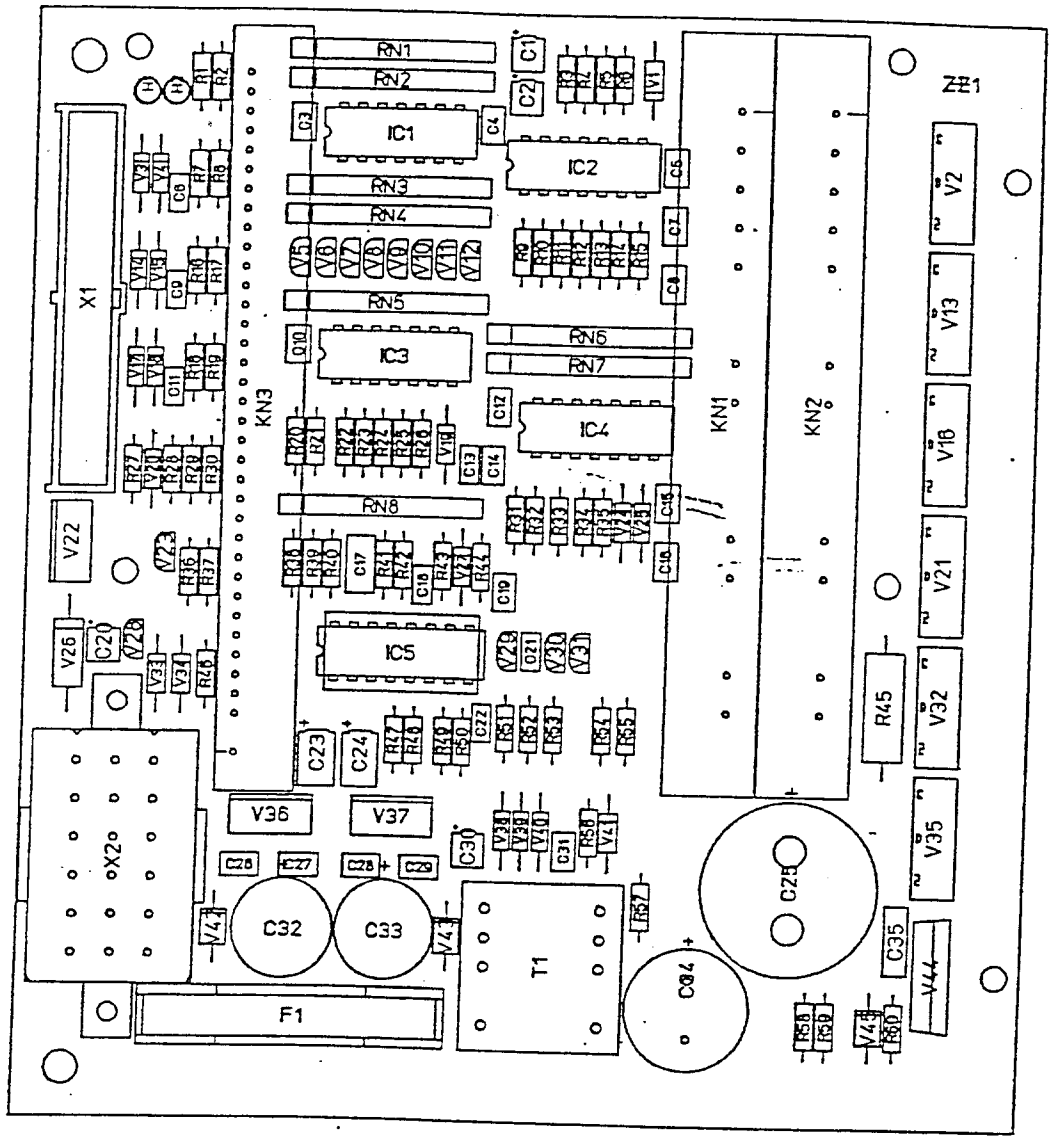
Block diagram



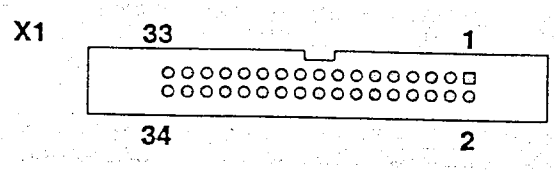
Signals to and from the LTM300

[1] Application–dependent

LTM 300

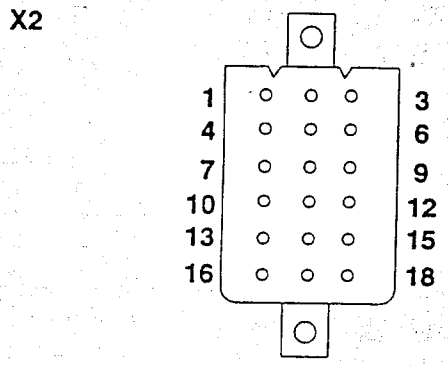

RN1
RN2
RN3
RN4
RN5
RN6
RN7
RN8
IC1
IC2
IC3
IC4
IC5
KN1
KN2
KN3
X1
X2
T1
F1
C32
C33
C34
C25
V36
V37
V2
V13
V16
V21
V32
V35
V22
V26
R45

Pin assignment



Male connector X1

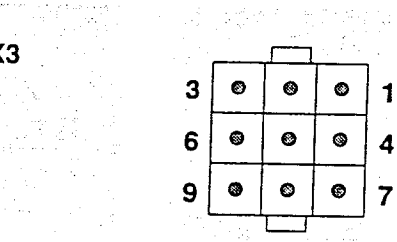
X1 Data line to ZSK or EWK



Female connector X2

X2 Control cable to motor

Pin	Function
1	Hall signal A
2	Hall signal B
3	Hall signal C
4	Determination of temperature
5	Code resistance
6	Tacho signal 1 [1]
7	Tacho signal 2 [1]
8, 9	Not used
10, 13	Ground 15V
11	15V DC supply voltage / motor electronics
12	⏚
14	24V DC supply voltage / brake
15	Brake [1]
16	Winding W
17	Winding V
18	Winding U



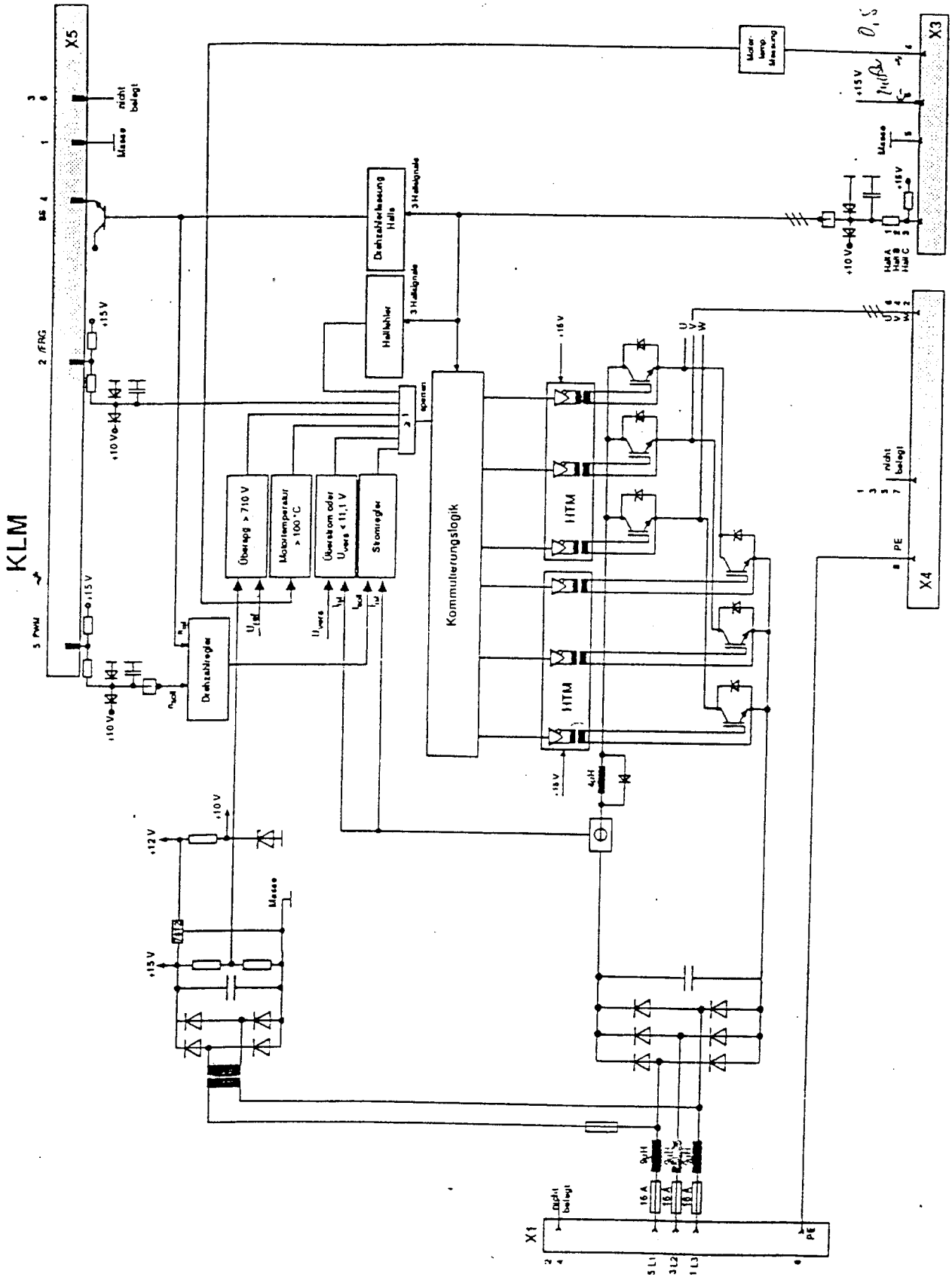
Male connector X3

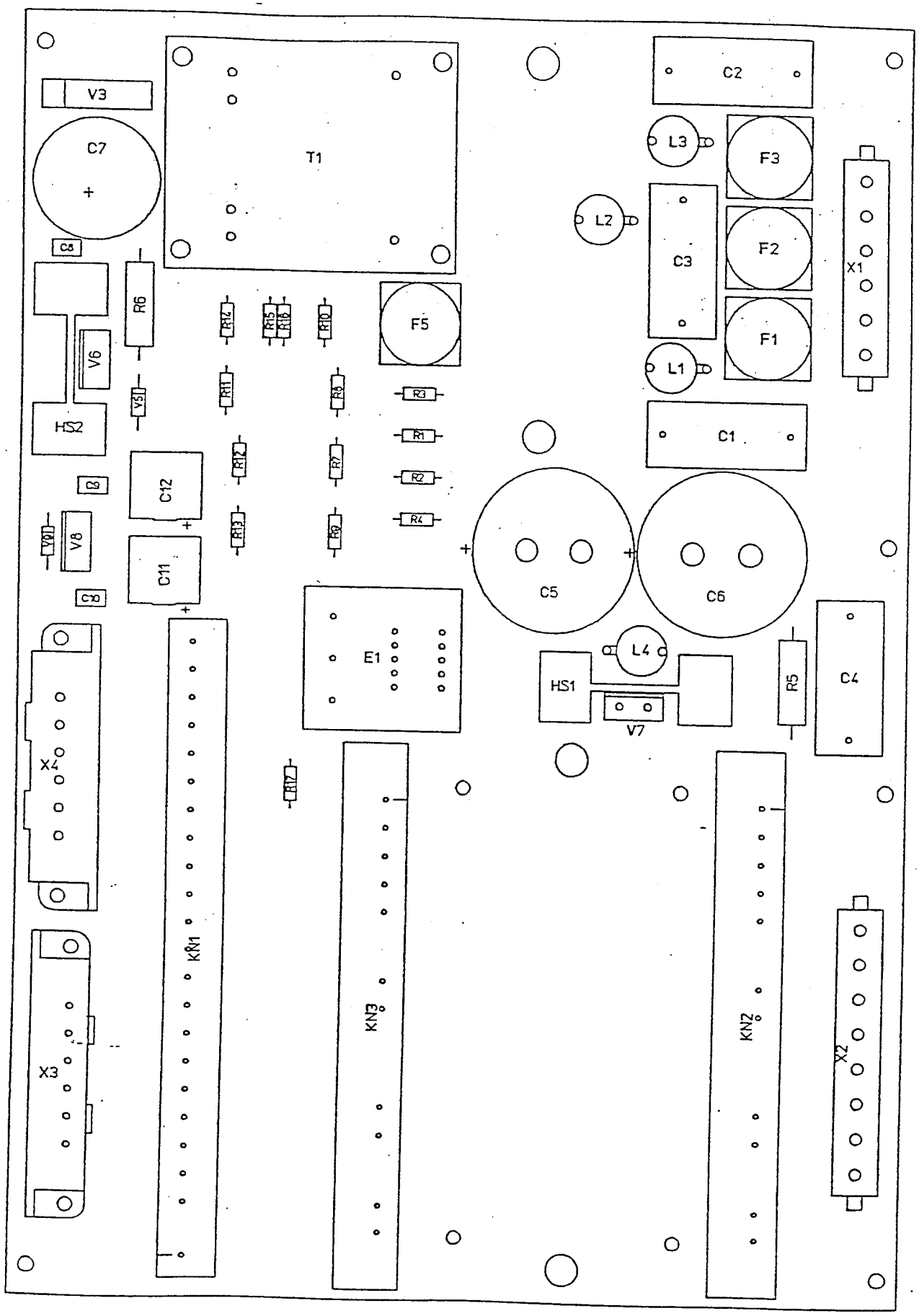
X3 Power supply/control cable

Pin	Function
1, 9	Not used
2	120V DC [1]
3	Interrogation signal governor foot [1]/pulse delivery pile [1]
4	Ground 24V
5	48V DC
6	24V DC
7	⏚
8	Ground 48V

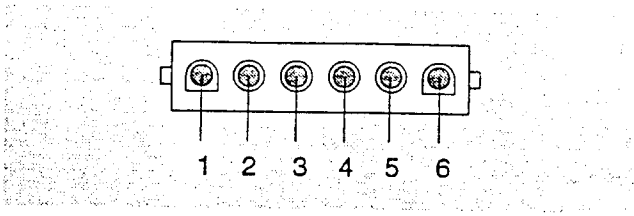
[1] application-dependent

Blockschaltbild KLM -




V3
C7
T1
C2
L3
F3
L2
C3
F2
X1
R6
F5
F1
L1
V6
V5
C1
C12
C5
C6
V8
C11
E1
L4
HS1
R5
C4
V7
X4
KN1
KN3
KN2
X3
X2

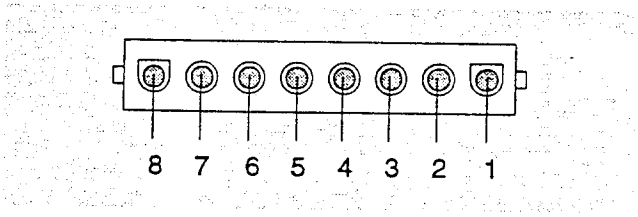
Pin assignment



Plug connector KLM-X1 on KLM

Plug connector KLM-X1:

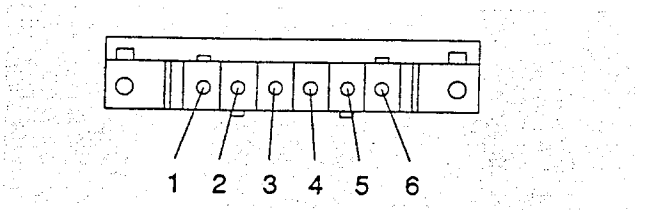
Pin		Function
1	–	L3; from interference suppressor filter 15Z1 (line 5)
2	–	Free
3	–	L2; from interference suppressor filter 15Z1 (line 3)
4	–	Free
5	–	L1; from interference suppressor filter 15Z1 (line 1)
6	–	PE conductor



Plug connector KLM-X4 on KLM

Plug connector KLM-X4:

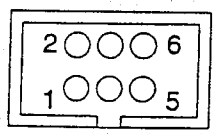
Pin		Function
1	–	Free
2	–	W; to 15M40
3	–	Free
4	–	V; to 15M40
5	–	Free
6	–	U; to 15M40
7	–	Free
8	–	PE conductor



Plug connector KLM-X3 on KLM

Plug connector KLM-X3:

Pin		Function
1	–	Hall A
2	–	Hall B
3	–	Hall C
4	–	Motor temperature 15M40
5	–	Ground
6	–	+15V DC



Plug connector KLM-X5 on KLM

Plug connector KLM-X5:

Pin		Function
1	–	Ground
2	–	Enabling (FRG); from EWK1
3	–	Free
4	–	Fault message from KLM
5	–	PDM signal; from EWK1
6	–	Free

M73, M73a, M73b, M73c, M82 Blower motors

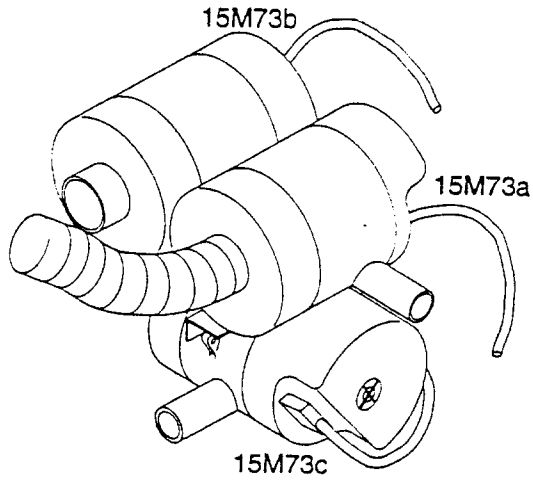
Designation

M73	Front edge blower
M73a	Sheet decurler
M73b	Blast air delivery
M73c	Sheet brake
M82	Blower bar perfecting unit (only with perfecting unit)

Place of installation

The blower motor M73 is located underneath the feeder on O.S.. The blower motors M73a, b, c are located on the D.S. underneath the footstep at the delivery. On a press with perfecting unit the motor M82 is installed on the D.S. at the reversing drum.

Design and task

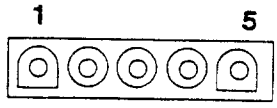


Blower motors M73a, M73b, M73c with plug assignment

The blower motors are multi–stage radial compressors which are driven by brushless direct current motors. Independent of the pump for suction/blast air they provide the blast air for front edge blowers (M73), sheet decurler (M73a), delivery blast air (M73b), sheet brake (M73c) and blower bar perfecting unit (M82).

The control of the individual blower motors occurs via rotary potentiometers (10 kΩ) on the allocated setpoint modules SWM.

Pin assignment



Pin	Function	
1	0...10V DC	(blue)
2		(brown)
3		PE
4	240V AC	(black)
5		(black)

Plug 15M73a, b, c

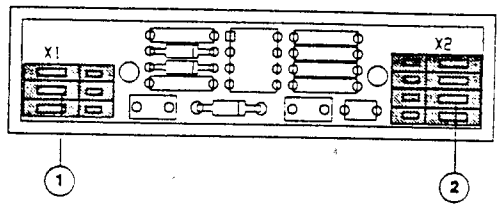
Technical data

Voltage:	240 V AC; 50/60Hz
Temperature:	10 °C – 55 °C
Sound level:	≦78dBA per blower
Volume rate:	max. 90 m^3/h
Pressure:	max. 200mbars
Vacuum:	max. –160mbars
Air temperature rise:	20K
Speed:	0 ... 13500 min^{-1}

See under HDM no. G2.179.1501 for more technical data.

SWM Setpoint module

Layout



Setpoint module SWM

① X1 Terminal strip 3pole; connection to potentiometer

② X2 Terminal strip 4pole; connection to blower

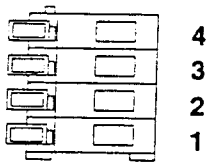
Function

The potentiometer linked to the setpoint module SWM transfers an analog voltage value to the SWM. From this voltage value the IC on the SWM generates a PWM signal (pulse duration modulated). The PWM signal is passed on to the connected blower.

The blower is a motor with internal electronic system. The internal motor electronic system controls the output of the blower via the PWM signal.

Terminal assignment

X2

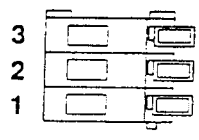


X2 Terminal strip, 4pole

X2 Terminal connection to the blower

Terminal	Function
1	+ 24V
3, 4	⊥ 24V

X1



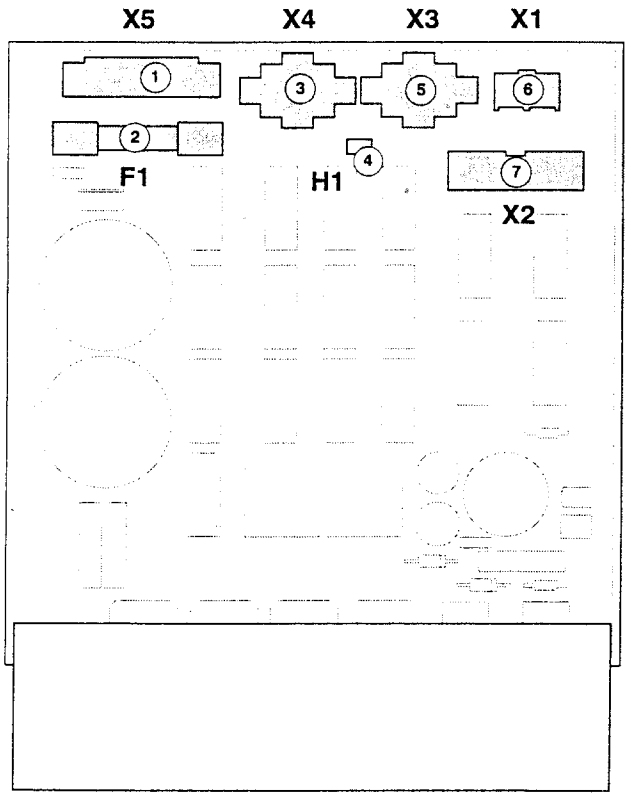
X1 Terminal strip, 3pole

X1 Terminal connecton to the potentiometer

Terminal	
1	
2	
3	

SLM Pile power module

Layout



Pile power module SLM

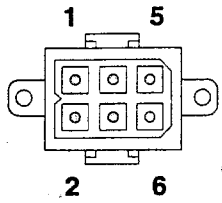
① Plug connector X5
② Fuse F1
③ Plug connector X4
④ LED H1 (supply voltage DC 28 V)
⑤ Plug connector X3
⑥ Plug connector X1
not assigned
⑦ Plug connector X2
interface to ZTK-X5 and ZTK-X6

Purpose

Each pile power module SLM controls the pile lifting motor feeder M3 and the pile lifting motor delivery M2. The module feeds the direct current motor with a voltage of DC 28 V. The power module receives the control data via the primary central control board ZTK. Via the plug connector X4, the SVK3 can block both motors through an emergency stop signal.

Pin assignment

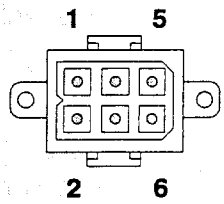
Plug connector X3



Plug connector SLM-X3

Pin	Function
1	DC +12V
2	Tacho track A
3	Tacho track B
4	Ground
5	Ground
6	Coding for motor

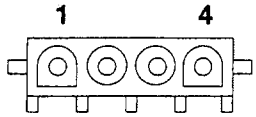
Plug connector X4



Plug connector SLM-X4

Pin	Function
1	Rotatary lockout clockwise rotation 0V = blocked DC 24V = enabled
2	Rotatary lockout counter-clockwise rotation 0V = blocked DC 24V = enabled
3	Pile control signal from the press
4	Ground
5	Redundant enabling signal for power part and motor 0V = enabling given
6	–

Plug connector X5



Plug connector SLM-X5

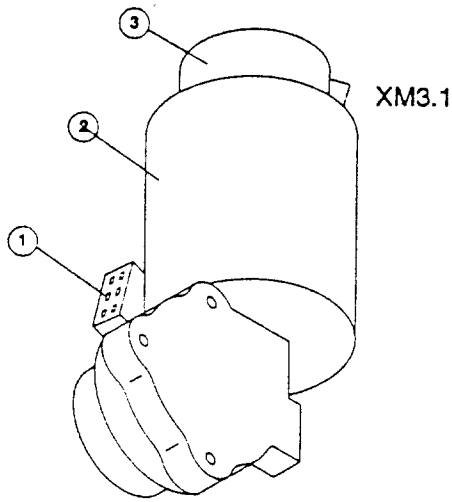
Pin	Function
1	DC +28V
2	Ground
3	Motor +
4	Motor –

11M1 Main pile at feeder

Place of installation

The motor of the main pile at the feeder 11M1 is installed at the O.S. underneath the feed table.

Design

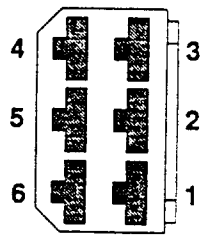


Motor of main pile at feeder 11M1

① Plug 15X1
② D.C. geared motor 11M1
③ Tacho

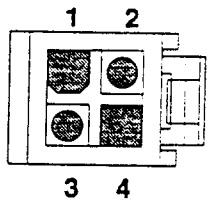
Rated torque:	5 Nm
No–load speed:	70 $min.^{-1}$
Transmission:	46 : 1
Cables:	The motor line is connected to the motor via the plug 15X1. The control cable is brought out directly at the tachometer cover and ends at the plug XM3.1.

Pin assignment



Plug 15X1

Pin	Function
1–4	–
5	24V DC/ground 24V
6	Ground 24V/24V DC



Plug XM3.1

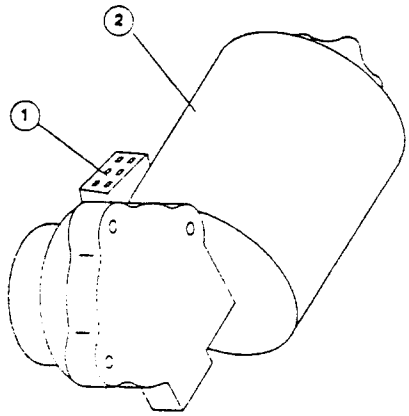
Pin	Function
1	+12V DC (white)
2	–12V DC (grey)
3	Pulses (10/rotations, violet)
4	Pulses (10/rotations, blue)

12M1 Main pile at delivery

Place of installation

The motor for the delivery main pile 12M1 is installed at the O.S. at footstep height at the side frame.

Design



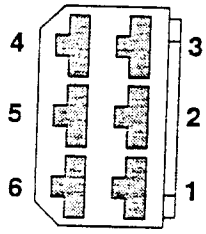
Motor of main pile at delivery 12M1

① Plug 15X1

② D.C. geared motor 12M1

Rated torque:	5 Nm
No–load speed:	70 min.$^{-1}$
Transmission:	46 : 1
Cables:	The motor line is connected to the motor via the plug 15X1.

Pin assignment



Plug 15X1

Pin	Function
1 – 4	–
5	24V DC/ground
6	Ground/24V DC

X2

SCHNITTSTELLE ZTK

X1

SCHNITTSTELLE ZSK/EWK

X4

SCHNITTSTELLE SICHERHEITSKREIS

AUSWERTUNG "MOTOR DREHT" "MOTOR STEHT"

ERKENNUNG UNTERSPANNUNG

REDUNDANTER SICHERHEITS-KREIS

ANSTEUERLOGIK FÜR TRANSISTOREN

STROMISTWERT-ERFASSUNG

ANSTEUERUNG THYRISTOR

TREIBERSTUFEN FÜR TRANSISTOREN

LEISTUNGS-TRANSISTOREN H-BRÜCKEN

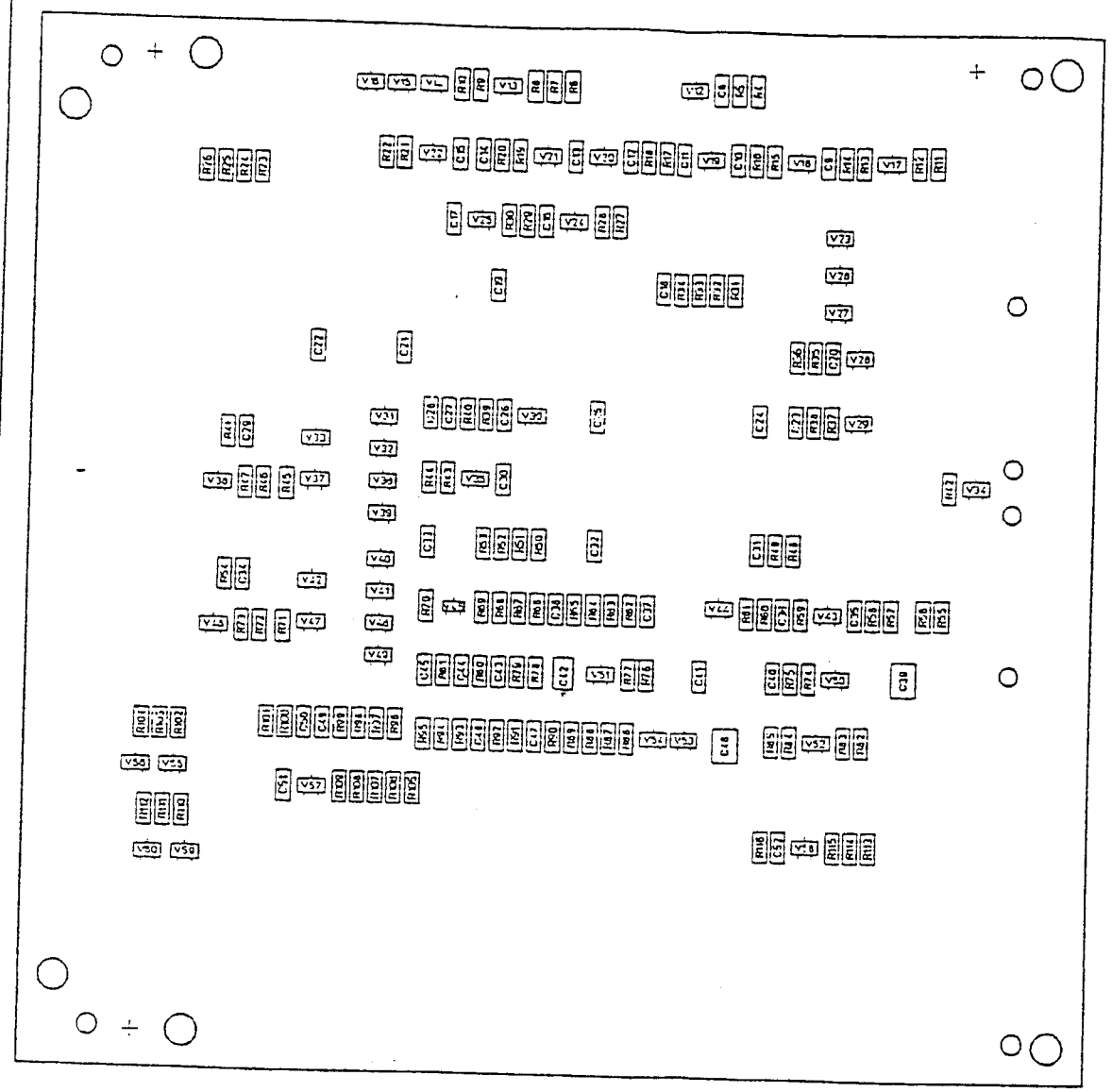
AUFBEREITUNG ELEKTRONIK-SPANNUNG

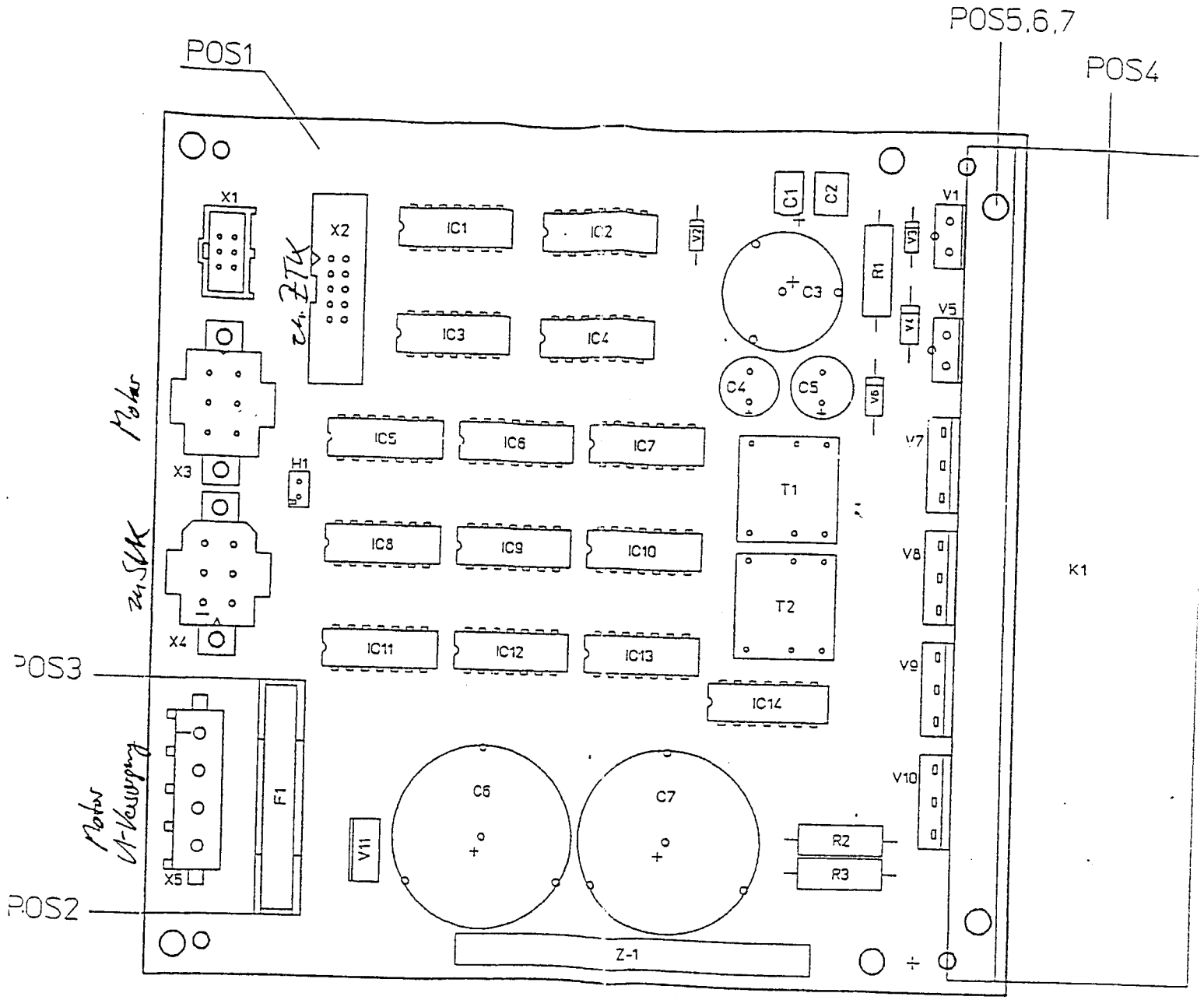
X3

SIGNALE MOTOR

X5

SCHNITTSTELLE MOTOR/SPANNUNGSVERSORGUNG





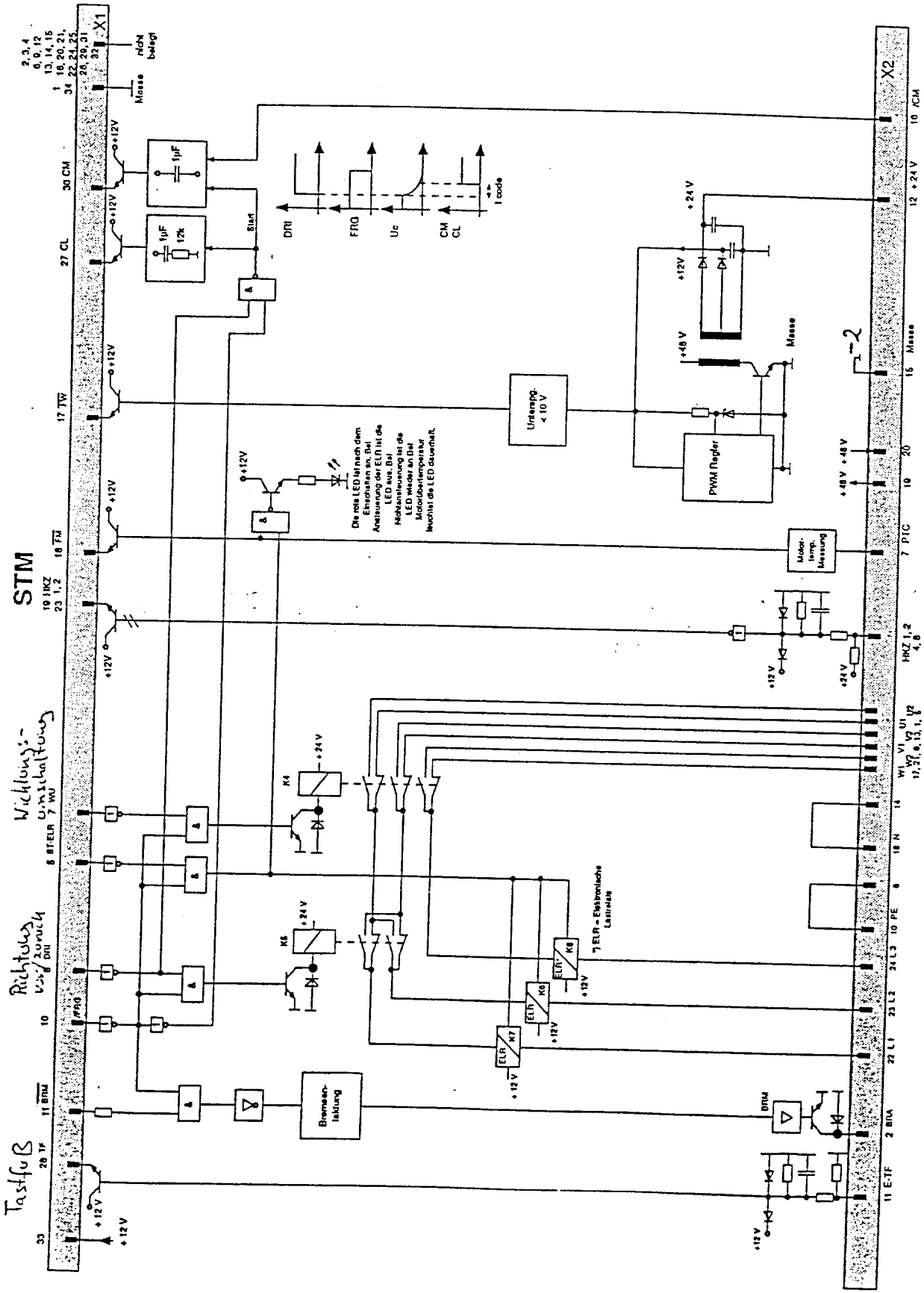
V7-10
H-Brücke

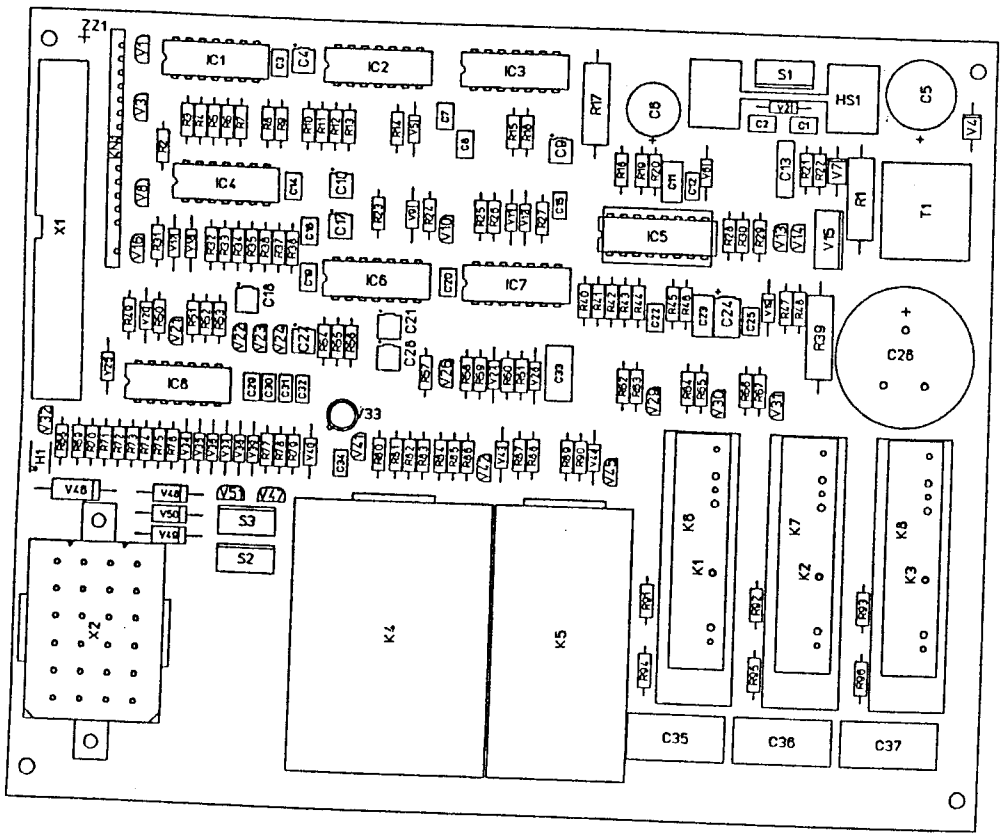
☞STM, X1

Futterlieb RSC-Bangkok

---Pin28 = /TF, governor foot, high=not operated
Init-test / code check
---Pin10 = /FRG, release powerpart, high (powerpart not released)
---Pin08 = /DRI, revolve. direction, low pulse (trigger code resistor check)
---Pin30 = CM, code motor, low pulse (pulse - with proportional to res. value)
---Pin27 = CL, code power part low pulse (pulse - with proportional to res. value)
remark:
Contactor 15K47 is switched on, the control N.O contact of the motoroverload 15Q47 is tested. If N.O. is open once during INIT or afterwards, the contactor 15K47 switches off. This causes DYN FFFB as soon as the motor will try to start. It requires an new initialisation.
Motor not operated
---Pin17 = /FW, error warning, high
---Pin18 = /FM, error massage, high X2/Pin07 = temp. resist. 30 degree C = 24.16VDC
---Pin10 = /FRG, release powerpart, high
---Pin11 = /BRM, release break, high
Motor start
---Pin10 = /FRG, release powerpart, low
---Pin05 = /ST_ELR, solid state relais, low after 20ms after DRI, WU, BRM signals .
---Pin11 = /BRM, release break, low
---Pin08 = /DRI, rev. direction, high = up, low = down
---Pin07 = /WU, low speed coil =high high speed coil = low
Motor started
---Pin19 = HKZ1, hall sensor 1
---Pin23 = HKZ2, hall sensor 2, HKZ1&2 pattern change (feedback revolving o.k.& direction o.k. & brake o.k.)
Change revolving direction
---Pin05 = /ST_ELR, solid state relais, high, 3 phases are switched off
---Pin11 = /BRM,release brake high, brake clamps the motor axes.
---Pin08 = /DRI, direction change low or high 80ms after /BRM signal high
---Pin11 = /BRM, release brake low, release brake 20ms after /DRI
---Pin05 = /ST_ELR, solid state relais low 20ms after /BRM
Error evaluation
---Pin18 = /FM low if motor temperature is over 100°C
---Pin17 = /FW low if 12VDC onboard logic supply is lower then 10V

Blockschaltbild STM

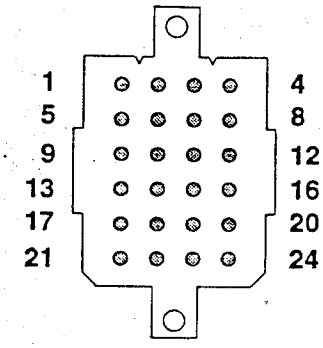




Änderungsmitteilungs-Nummer			Maßstab 1:1	PCDS 2.1	Projektion
-			Format A3	-	
	Datum	Name	Benennung STM		Erst-erstellung
Bearb			STAPEL-STEUER-MODUL		
Gepr.			-		
Norm	-	-	-		Blatt- Nr. / Ausg
HEIDELBERGER DRUCKMASCHINEN AG			Unterlagen-Nr. BSP		- / -

Pin assignment

X2



Male connector X2

X2 Control cable motor and power supply STM

Control cable motor

Pin	Function
1	Winding U1 (low speed)
2	Brake
3	Ground 24V
4	Hall signal 1 (HKZ1)
5	Winding U2 (high speed)
7	Determination of temperature
8	Hall signal 2 (HKZ2)
9	Winding V1 (low speed)
10	⏚
12	24V DC supply voltage motor electronics
13	Winding V2 (high speed)
16	Code resistance
17	Winding W1 (low speed)
18	N
20	48V DC supply voltage brake
21	Winding W2 (high speed)

Power supply STM

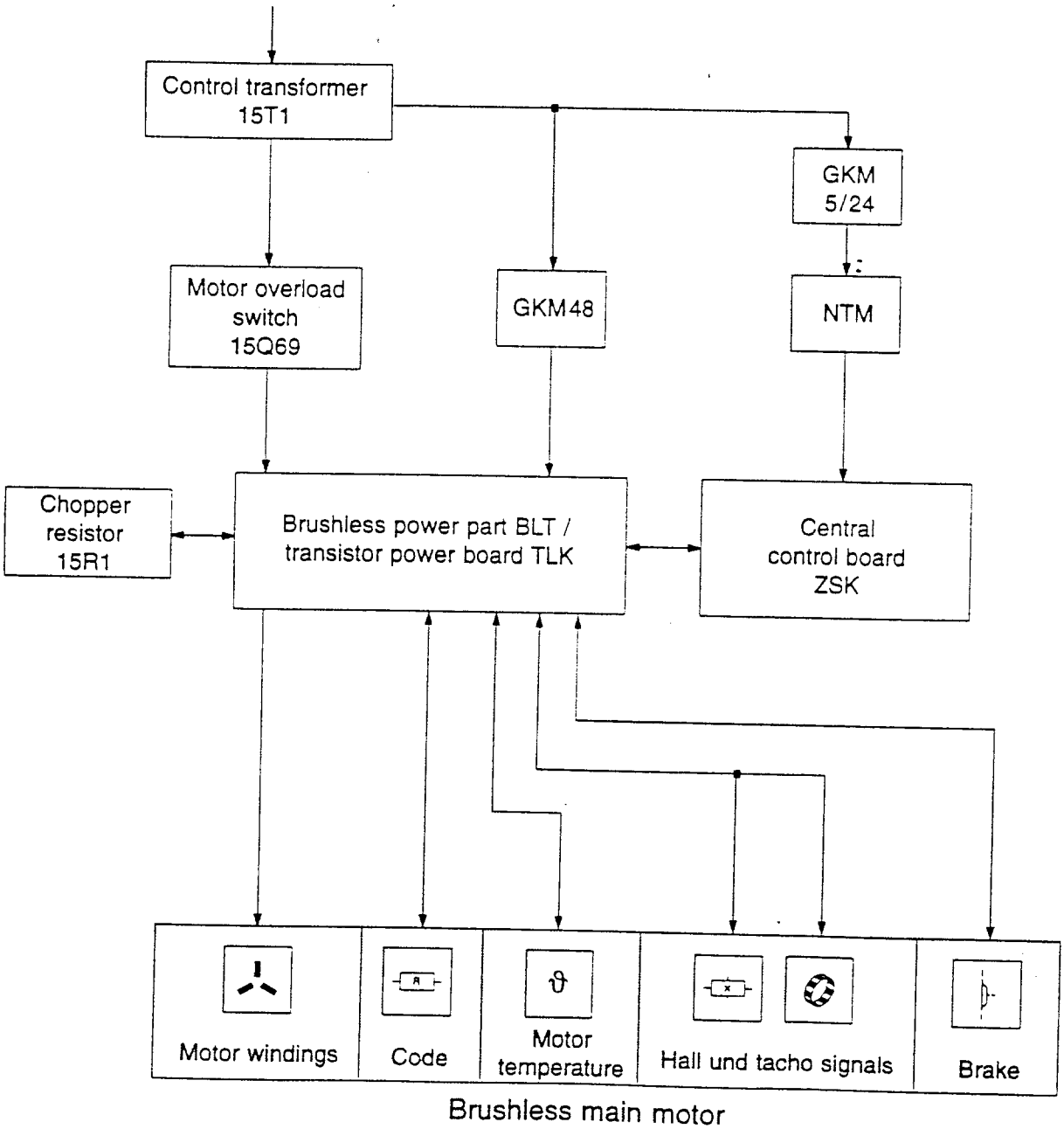
Pin	Function
6	⏚
11	Interrogation signal governor foot [1]/pulse delivery pile [1]
14	N
15	Ground 48V DC
19	48V DC
22	L1
23	L2
24	L3

[1] Application-dependent

Main drive control

Brushless main drive

Block diagram of the components



Components of the brushless main drive

Functional relationships

Control transformer 15T1

From the mains voltage the control transformer generates the individual voltages for the printing press. For main drive control the control transformer 15T1 supplies the compact rectifier modules GKM.

Motor overload switch 15Q69

This switch is an overload protection for the main drive. It is in series with the BLT/TLK.

Brushless power part BLT

The brushless power part BLT rectifies the three-phase supply voltage. The generated direct voltage is made available, as an intermediate circuit voltage, to the six power transistors which are set up as a three-phase bridge. Depending on the information received from the central control board ZSK, the transistors feed current to the main motor.

Transistor power board TLK

The transistor power board TLK performs the same functions as the BLT. The TLK and BLT differ in their power output.

Main motor M1

The main motor M1 is a brushless d.c. motor with rotor position encoder. The motor contains code resistors which inform the ZSK about the motor output. Apart from this, the motor contains three PTC-resistors which determine the present motor temperature and transmit it to the ZSK. The rotor position encoder generates three phase-displaced Hall signals and two tacho signals. These Hall and tacho signals are transmitted to the ZSK for regulation.

Chopper resistor 15R1

The chopper resistor 15R1 converts the energy fed back by the main motor into heat. This prevents the uncontrolled rise of the intermediate circuit voltage.

In the case of the transistor power board TLK, the chopper transistor is located directly on the electronic board.

Compact rectifier module GKM5

From the 3x20V AC received from the control transformer 15T1, the rectifier module GKM5 generates a direct voltage of +28V DC which is made available to the power supply module NTM.

Compact rectifier module GKM24

From the 3x27V AC received from the control transformer 15T1, the rectifier module GKM24 generates a direct voltage of +38V DC. This voltage is also made available to the power supply module NTM.

Compact rectifier module GRM48

From the 3x37V AC received from the control transformer 15T1, the rectifier module GRM48 generates a direct voltage of +52V DC. This voltage is transmitted to the transistor driver board TTK or to the transistor power board TLK, which uses it to generate, via an internal chopper-type power supply unit, the voltages for the electronics of the brushless main drive.

Power supply module NTM

From the voltages received from the compact rectifier modules GKM, the power supply module NTM generates the voltages for the electronics, which must be supplied to the central control board ZSK.

Central control board ZSK

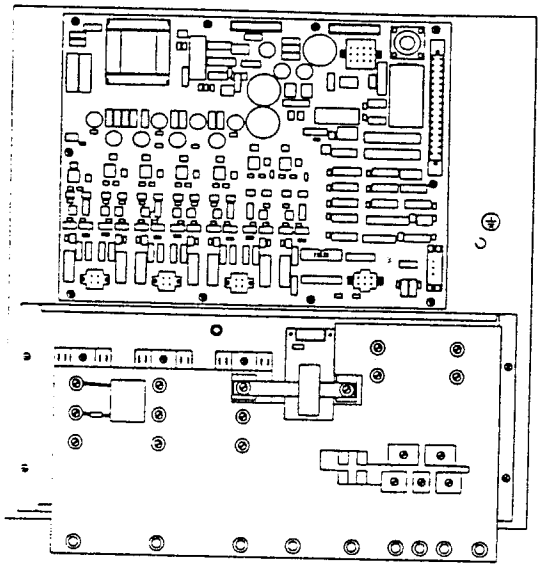
All functions necessary to drive the main drive are integrated on a BLA-IC on the central control board ZSK. The software allocates the following functions to this BLA-IC:

- enabling of BLT,
- current regulation,
- default for direction of rotation,
- detection of rpm,
- brake activation.

Encoder IDS

The encoder IDS informs the central control board ZSK about the current press speed, direction of rotation and degree (position of press).

Brushless power part BLT1/2



Brushless power part BLT1/2

The brushless power part BLT1/2 consists of the following components:

- transistor driver board TTK
- heat sink unit KVT with current measuring module SMM
- chopper resistor 15R1.

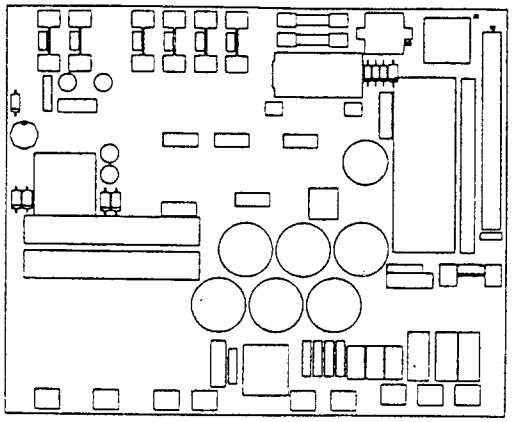
The transistor driver board TTK supplies the voltages for the transistor driver stages, the current measuring module SMM and the rotor position encoder. The power transistors of the heat sink unit KVT are triggered via the transistor driver stages. The trigger signals come from the ZSK and are interlocked against each other on the TTK. Activation of the brake is also effected by the TTK. The trigger signals for the brake come from the ZSK.

A bridge-connected rectifier on the heat sink unit KVT rectifies the supply voltage and makes it available to the six power transistors as an intermediate circuit voltage. This intermediate circuit voltage is stabilized by capacitors on the KVT. The six power transistors of the KVT are set up as a three-phase bridge. The driver stages of the TTK drive the power transistors and thus feed current to the windings of the main motor.

Via a current transformer the current measuring module SMM determines the motor current and converts the measured value into a proportional voltage signal. The signals from the SMM (motor current, temperature of KVT and code) and the signals from the main motor (temperature and code) are transmitted to the central control board ZSK via the TTK.

A chopper transistor on the KVT limits the intermediate circuit voltage by reducing any voltage peaks in the intermediate circuit through the chopper resistor 15R1.

TLK Transistor power board



Transistor power board TLK

The transistor power board TLK feeds current to the brushless main drives with up to 5 kW.

Power electronics

On the TLK the supply voltage (400 V AC, 3~) is rectified and made available to the power transistors as an intermediate circuit voltage. The signals required to trigger the power transistors come from the central control board ZSK via a 64-pole interface. On the TLK these signals are converted into potential-free signals and combined; then they trigger the power transistors. The power transistors feed current to the motor windings U, V, W.

Current acquisition

A current transformer on the transistor power board TLK determines the present motor current and passes the current value to the ZSK via the interface. The Hall and tacho signals from the motor are also transmitted to the ZSK via the TLK.

Chopper resistor

The intermediate circuit voltage is monitored on the TLK. If the intermediate circuit voltage is too high, the energy fed back by the main motor is converted into heat by the chopper resistor. From the information received from the ZSK, the TLK controls the transistor which feeds current to the chopper resistor.

Brake actuation

On the TLK, the brake control signals from the ZSK are converted into potential-free signals via an optocoupler. A relay uses these control signals to actuate the brake.

Motor code and temperature

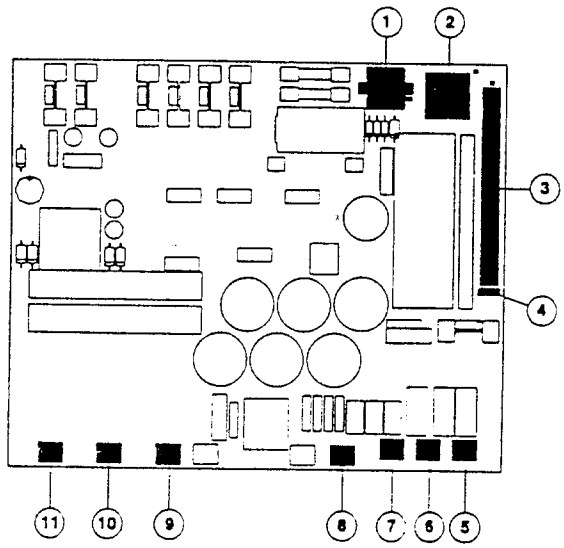
Plug X3 determines the motor temperature and motor code and, via the 64-pole interface, it passes this information to the ZSK for monitoring purposes.

Voltages for the electronics

The voltages required for the internal logic, the transistor driver stages and the motor electronics (Halls and tacho) are generated by an internal power supply unit on the TLK. The supply voltage for the power supply unit comes from the compact rectifier module GKM48 (+48 V DC).

TLK Transistor power board

Layout



Transistor power board TLK

① X3 Socket base 12pole;
plug connection to the GKM and to the main motor M1

② X4 Socket base 12pole;
plug connection to the main motor M1

③ X2 Terminal strip 64pole;
plug connection to the ZSK

④ X1 Pin base 4pole;
plug connection to the heat sink

⑤ X11 Terminal L3

⑥ X10 Terminal L2

⑦ X9 Terminal L1

⑧ X12 Terminal PE

⑨ X6 Terminal W

⑩ X7 Terminal V

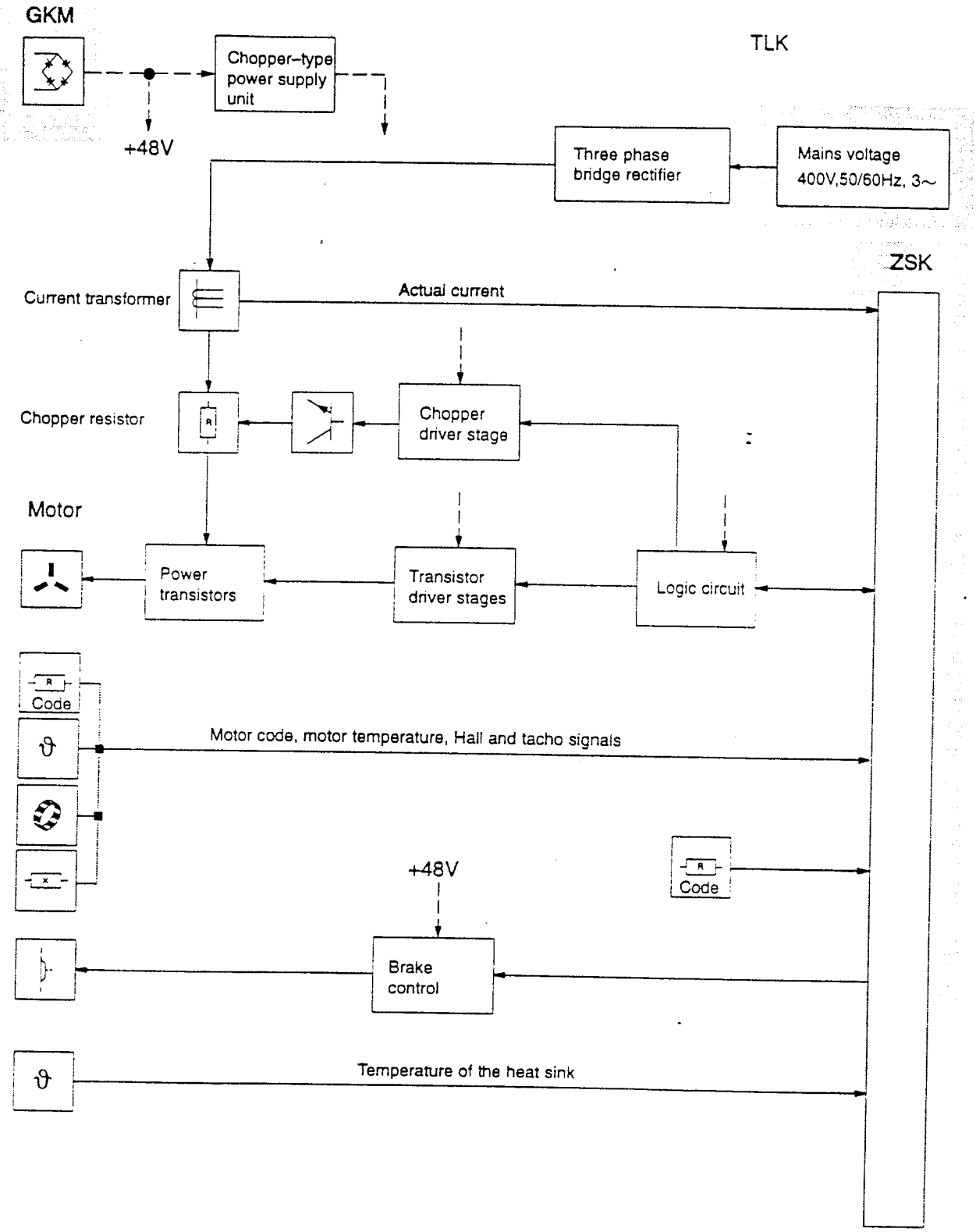
⑪ X8 Terminal U

Task

The transistor power board TLK:

- rectifies the supply voltage,
- controls the main drive,
- registers the motor current,
- generates the voltages for the internal logic circuit and the motor electronics system via a power supply unit.

Block diagram



Signals to and from the TLK

Function

The transistor power board TLK is responsible for the supply of current for the brushless main drives up to 5KW.

Power electronics

The supply voltage (400V, AC, 3~) is rectified on the TLK and made available to the power transistors as intermediate voltage.

The signals necessary for the control of the power transistors come from the central control board ZSK via a 64pole interface. On the TLK these signals are converted into potential–free signals and are logically combined; then they control the power transistors. The power transistors supply the motor windings U, V, W with current.

Current detection

A current transformer on the TLK detects the present motor current and passes the detected value to the ZSK via an interface. The Hall and tacho signals coming from the motor are also led to the ZSK via the TLK.

Chopper resistor

The intermediate voltage is monitored on the TLK. If the intermediate voltage is too high, the chopper resistor converts the energy fed back from the main motor into heat. In accordance with the specifications from the ZSK, the TLK controls the chopper transistor which supplies the chopper resistor with current.

Brake control

On the TLK, the brake control signals coming from the ZSK are converted potential–free via optocouplers. A relay switches the brake by means of these control signals.

Motor code and temperature

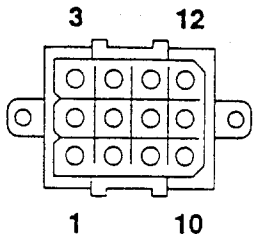
The motor temperature and the motor code is detected via the plug X3 and is passed on via the 64pole interface to the ZSK for reasons of monitoring.
In this way it is made sure that no wrong components can be operated.

Voltages of the electronics system

The voltages of the electronics system required for the internal logic circuit, the transistor driver stages and the motor electronics (Hall's and Tacho) are generated via an internal power supply unit on the TLK. The supply voltage of the power supply unit comes from the compact rectifier module GKM (+48V DC).

Pin assignment

X3

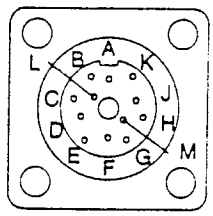


Socket base X3, 12–pole

X3 Plug connection to GKM48, ZSK and motor

Pin	Function
2	⊥ 48V
5, 6	+ 48V DC

X4

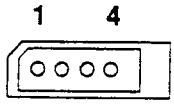


Socket base X4, 12–pole

X4 Plug connection to the motor

Pin	Function
A	⊥ 15V, 12V
B	Screen
C	+15V DC
D	+12V DC

X1



Pin base X1, 4–pole

X1 Plug connection to the temperature probe

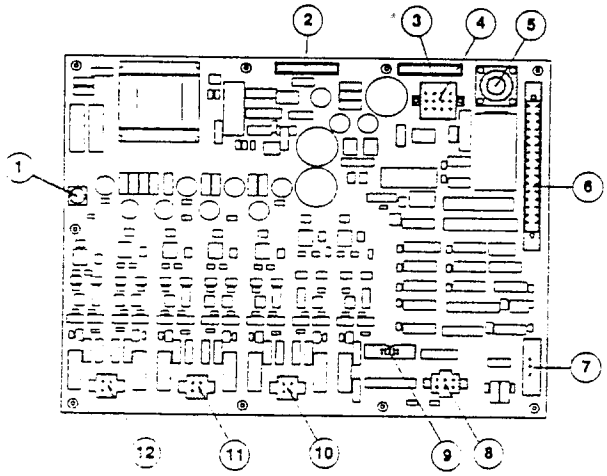
Pin	Function
1, 2,	⊥
3, 4	Temperature heat sink

TTK Transistor driver board

Attention:

- **High voltage!** After you have switched off the main switch, first wait for the **discharge time** of the capacitors (**3 min**) to elapse.

Layout



Transistor driver board TTK

① LED Chopper–type power supply unit / functional check

② F1 Fuse for chopper–type power supply unit / 1.6A slow–blow

③ F2 Fuse for brake / 3.15A slow–blow

④ X3 Female connector / plug connection
- to GKM
- to main motor brake
- to (ZSK, MSK)[1] (via EVM)

⑤ X4 Socket base / plug connection to main motor (rotor position sensor)

⑥ X2 Pin base / interface to (ZSK, MSK)[1]

⑦ X10 Socket base / plug connection to chopper resistor 15R1

⑧ X9 Pin base / plug connection to KVT1

⑨ X5 Pin base / plug connection to SMM

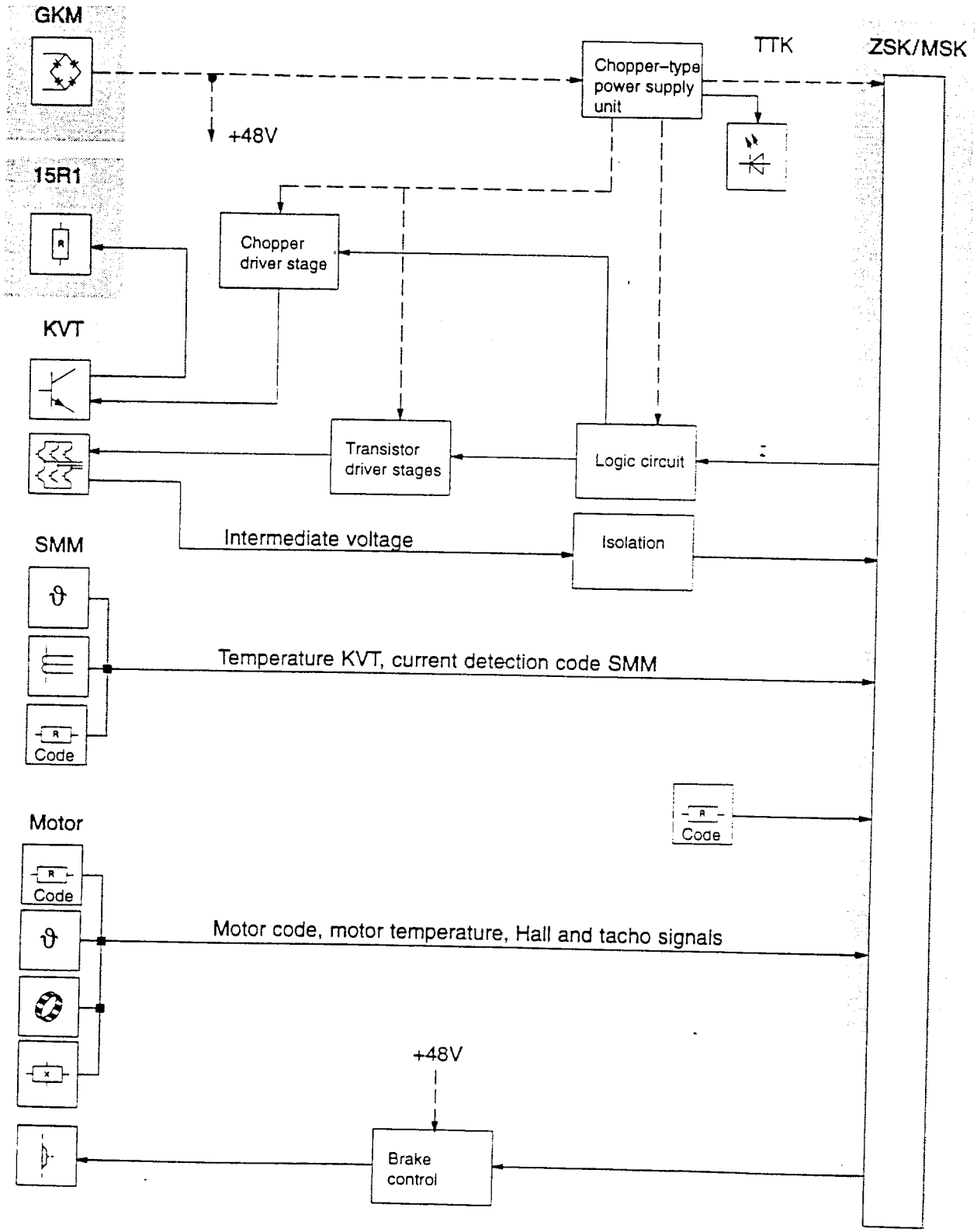
⑩ X8 Socket base / plug connection to KVT1

⑪ X7 Socket base / plug connection to KVT1

⑫ X6 Socket base / plug connection to KVT1

1 dependent on press type

Block diagram



Signals to and from the TTK

Task

The TTK

- conditions the control signals from the motor control board MSK or the central control board ZSK.
- controls the power transistors of the brushless main drive BLT1/2.
- controls the chopper transistor.
- transfers the motor and heat sink data acquired by KVT1 to the MSK/ZSK.
- switches the brake of the main drive.
- generates the voltages for the driver stages, the internal electronics system and the motor electronics from the 48V DC supply voltage via an internal power supply unit.

Function

Chopper–type power supply unit

The transistor driver board TTK is supplied with 48V DC. The chopper–type power supply unit which provides the supply voltage for the seven transistor driver stages from the supplied 48V is located on the TTK. The chopper–type power supply unit also supplies the internal logic circuit, the motor electronics system (Hall sensors,tacho etc.), the MSK, the driving part of the ZSK. A green light–emitting diode which is illuminated when the chopper–type power supply unit is in operation, is located on the TTK.

Logic circuit

The control signals coming from the electronic boards MSK or ZSK are interlocked against each other and converted into potential–free signals for the transistor control via an optocoupler. The intermediate voltage is picked off by the heat sink unit KVT1 and is converted into a quasi–potential–free measuring signal. This measuring signal is transferred to the MSK or ZSK.

Driver stages

The potential–free control signals are amplified for the power transistors on the driver stages.

Chopper control

The MSK or ZSK controls the chopper transistor, which is located on the heat sink unit. This chopper transistor switches the chopper resistor 15R1, which converts the energy fed back from the motor into heat (when braking and changing direction of rotation).

Brake control

After enabling the brake control, the brake is overexcited with 48 V and cycled after a period of 150 ms. The relay on the TTK is used as make contact and for the rapid switch–off.

Others

The TTK detects the Hall and tacho signals from the motor, the motor temperature and the motor code and sends them on to the MSK or ZSK. The motor current, the heat sink temperature and the SSM code detected by the current measuring module SMM are passed on to MSK or ZSK via the TTK.

1.2.2 Schnittstelle B2:

Über die Schnittstelle B2 wird die Verbindung zwischen der MSK und dem Leistungsteil (BLT) hergestellt.

Sämtliche den Antrieb betreffenden Signale werden über diese Leitung geführt.

Die maximale Länge der Verbindungsleitung beträgt 2 m.

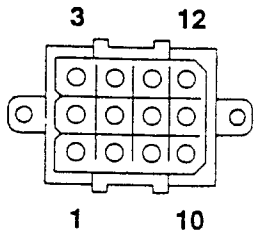
Schnittstelle B2 - Stecker X1

Federleiste 96-polig

c	b	a	
GND	n.c	GND	1
GND	n.c	Hall A ⎍ Puls 12V	2
GND	n.c	Hall B ⎍ Puls 12V	3
GND	n.c	Hall C ⎍ Puls 12V	4
Frg.OK	n.c	Tacho MA ⎍ Puls 12V	5
U/D.OK FMBr	n.c	Tacho MB ⎍ Puls 12V	6
Code STK2	n.c	Code M.0 ⎍ Puls 12V	7
FMBr	n.c	Code M.1 ⎍ Puls 12V	8
+ 7 V	n.c	+ 7 V 8,7V	9
Iist+	n.c	Iist- OA1/3&4 0,1µ/35V	10
U ZwKr.	n.c	n.c	11
n.c	n.c	n.c	12
BR 4 ⊥	GND	Temp. Motor	13
Temp. KK	GND	48V3	14
Code TTK	GND	Code SMM	15
GND	GND	GND	16
GND	GND	n.c	17
GND	GND	Tr.6	18
GND	GND	Tr.5	19
GND	GND	Tr.4	20
GND	GND	Tr.3	21
GND	GND	Tr.2	22
GND	GND	Tr.1	23
GND	GND	BR 1	24
GND	GND	BR 2	25
GND	GND	Tr.7	26
n.c	GND	n.c	27
n.c	GND	- 15 V	28
- 15 V	GND	- 15 V	29
+ 15 V	GND	+ 15 V	30
+ 15 V	GND	n.c	31
n.c	GND	n.c	32

Pin assignment

X3

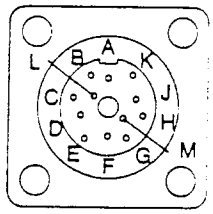


Socket base X3, 12–pole

X3 Plug connection to GKM48, EAK and motor

Pin	Function
1, 2, 3	⊥ 48V
5, 6	+ 48V DC

X4

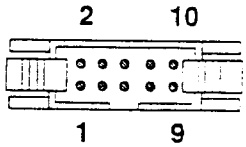


Socket base X4, 12–pole

X4 Plug connection to the motor

Pin	Function
A	⊥ 15V, 12V
B	Screen
C	+15V DC
D	+12V DC

X5



Pin base X5, 10–pole

X5 Plug connection to SMM

Pin	Function
1, 2,	⊥ 15V
3	+15V DC
4	–15V DC

Function

The rectifier provides the power transistors with a direct voltage (intermediate voltage), which it generates from the supplied three–phase voltage. The intermediate circuit voltage is stabilized by the two capacitors. Driven by the transistor driver board TTK, the power transistors transmit the intermediate circuit voltage to the main motor and thus supply the motor windings.

Current measuring module

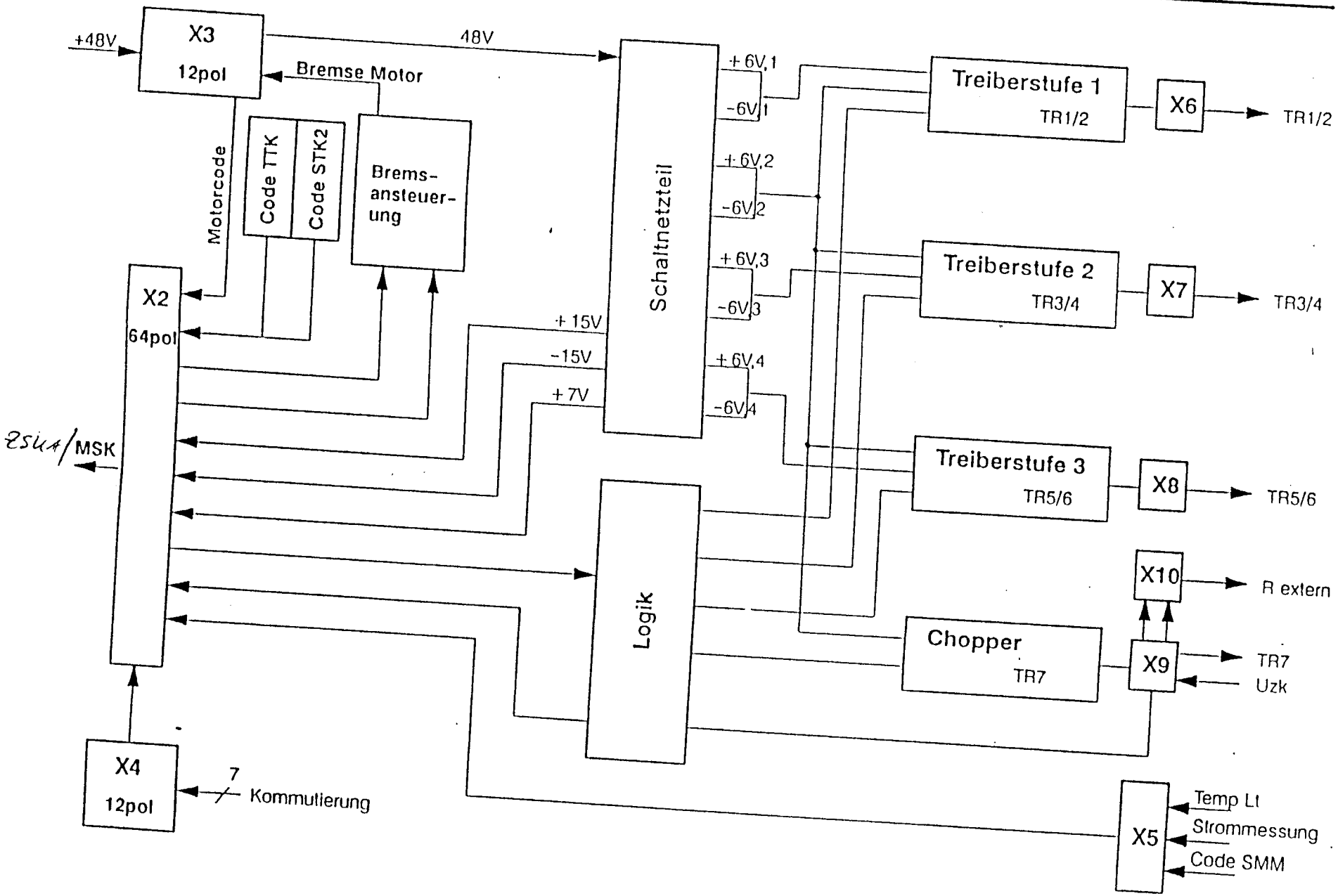
The intermediate circuit contains the current measuring module SMM. The SMM is equipped with a current transformer, which generates a voltage signal which is proportional to the current, if current flows. The heat sink of the KVT1 is equipped with a temperature probe, which is connected with the SMM through a plug. The acquired current and temperature values are passed on to the transistor driver board TTK. Apart from this, the SMM is equipped with code resistors which transmit information about the KVT to the TTK.

Chopper transistor

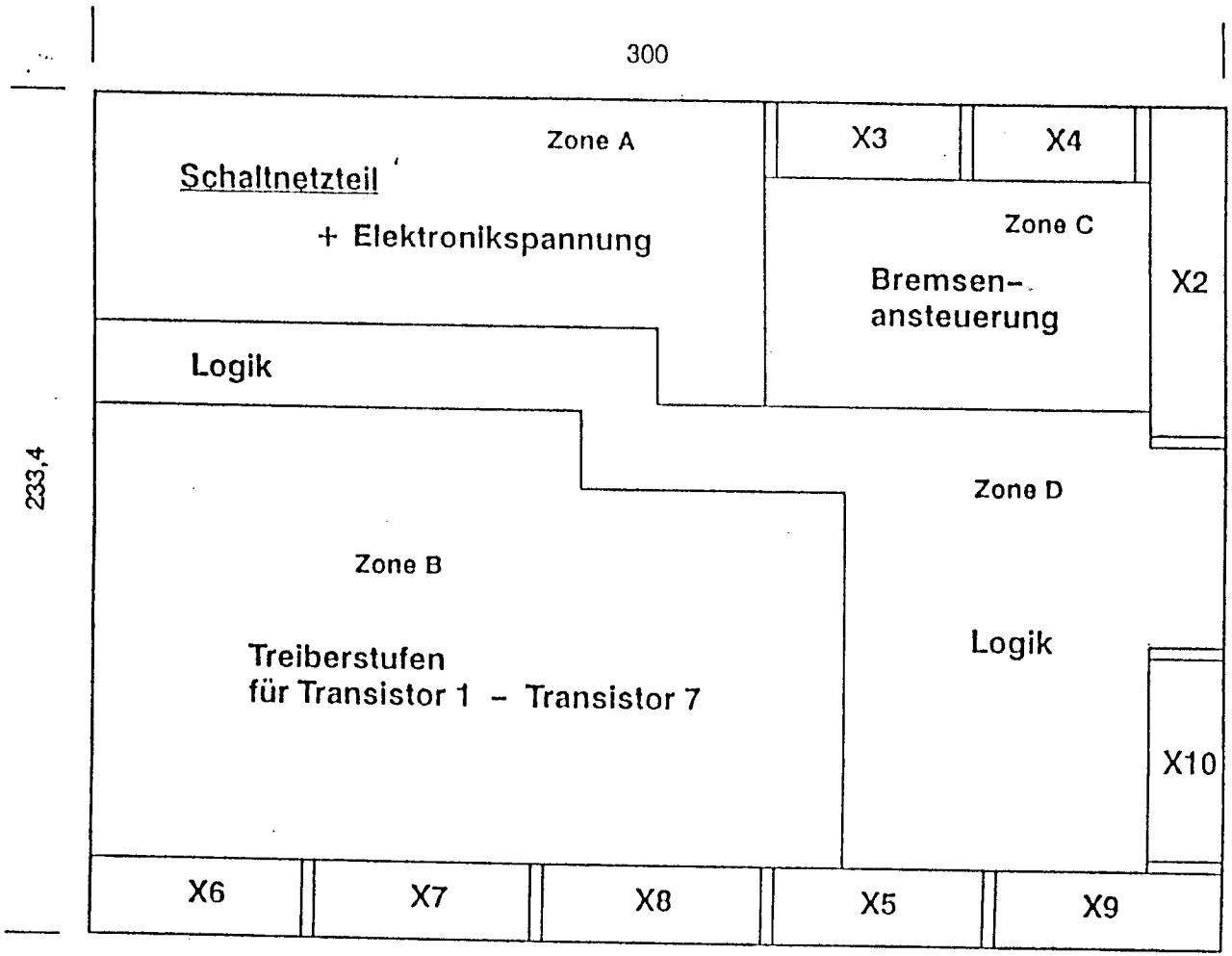
The chopper transistor on the connection p.c.b. is controlled by the transistor driver board TTK and feeds current to the chopper resistor 15R1 via the TTK. The chopper–type resistor converts energy which is fed back from the motor into heat. In this way it prevents an uncontrolled rise in voltage in the indermediate circuit.

Connection

The supply voltage connection and the connection of the motor windings U, V, W are provided directly on the connection p.c.b..



Transistor-Treiber-Karte TTK Blockschaltbild


300
233,4
Zone A
Schaltnetzteil
+ Elektronikspannung
X3
X4
Zone C
Bremsen-
ansteuerung
X2
Logik
Zone D
Zone B
Treiberstufen
für Transistor 1 – Transistor 7
Logik
X10
X6
X7
X8
X5
X9

Stecker X9 6poliger AMP-Stiftstecker

Kontakt-Nr.	Funktion
1	Basis 1
2	GND 2
3	Basis 2
4	Collector
5	
6	U.ZWKR

Verbindung von TTK zu Tr.7

Stecker X10 3poliger AMP-Buchsenstecker

Kontakt-Nr.	Funktion
1	R extern / Collector Tr. 7
2	
3	U.ZWKR

Verbindung von TTK zu R extern

HDM Umrichter

Gemessen am 64 pol. Flachkabel

Steckerbelegung X1 (Schnittstelle B; Verbindung zwischen MSK und BLT)

A1	⊥ Bezugspotential	C1	⊥
A2	Hall A 0 ⎍ 12V	C2	⊥
A3	Hall B 1	C3	⊥
A4	Hall C 0	C4	⊥
A5	Tacho Spur A ⎍	C5	FRG_OK n. used BLT
A6	Tacho Spur B ⎍ } 12V	C6	FMI_LT – High/OK not used BLT
A7	Kodewiderstand M0 (Leistungscode) R } beim	C7	Kode STK 2 ⎍ beim Init
A8	Kodewiderstand M1 (Herstellercode) ⎍ } Init.	C8	Fehlermeldung Bremse stat. 12V FM_BR
A9	÷ 7V 7,5V für 5V-Vers. MSK/	C9	÷ 7V 7,88V not used CDK HIGH/OK
A10	I_{IST-} = ⊥ I-Heßmodel	C10	I_{IST+} I_{ZWK} 3000 D/h -0,037V ≙ 1A } I_{ZWKR}
A11		C11	U_{ZWKR} 6000 D/h -0,2 V ≙ 3A – 6,55V ≙ 267V
A12		C12	
A13	Temperatur Motor 0,4V Temp_mot	C13	Bremse 4 (Signal von MSK) 25K 0,65V ⊥
A14	48V3 ≙ 7V von OP 20V MSK	C14	Temperatur Kühlkörper -6,19V Temp.kk
A15	Kodierung Strommeßmodul ⎍ beim Init 5mA	C15	Kode TTK ⎍ beim Init
A16	⊥ Bezugspotential	C16	⊥
A17		C17	⊥
A18	TR6 ⎍	C18	⊥
A19	TR5	C19	⊥
A20	TR4	C20	⊥
A21	TR3	C21	⊥
A22	TR2	C22	⊥
A23	TR1	C23	⊥
A24	Bremse 1 (Signal von REK1) 0,67V ⎍ 5V beim Init (K43)	C24	⊥
A25	Bremse 2 (Signal von REK2) 0,67V 25K	C25	⊥
A26	TR7	C26	⊥
A27		C27	FM_LT High/OK not used BLT
A28	-15V } Versorgungsspannung für den	C28	
A29	-15V } Analogteil auf der MSK	C29	-15V für ± 12V für OPs auf MSK
A30	÷15V } (vom Netzteil auf TTK erzeugt)	C30	÷15V } wie A29 bis A31
A31	⊥ } Bezugspotential	C31	÷15V
A32	⊥ }	C32	⊥

Stecker X5 10polige Miniaturkupplung

Kontakt-Nr.	Funktion
1	GND
2	GND
3	+ 15 V
4	- 15 V
5	Temp. KK
6	U/D.OK
7	Code SMM
8	Frq. OK
9	+ I-Ist
10	- I-Ist

Verbindung von TTK zu SMM

Stecker X6; X7; X8 4poliger AMP-Buchsenstecker

X6 für Verbindung von TTK zu Tr. 1 und Tr. 2
X7 für Verbindung von TTK zu Tr. 3 und Tr. 4
X8 für Verbindung von TTK zu Tr. 5 und Tr. 6

Kontakt-Nr.	Funktion
1	Basis 1
2	GND 2
3	Basis 2
4	GND 2

Heidelberger Druckmaschinen Aktiengesellschaft	Transistor-Treiber-Karte TTK	

Stecker X3 12poliger AMP-Buchsenstecker

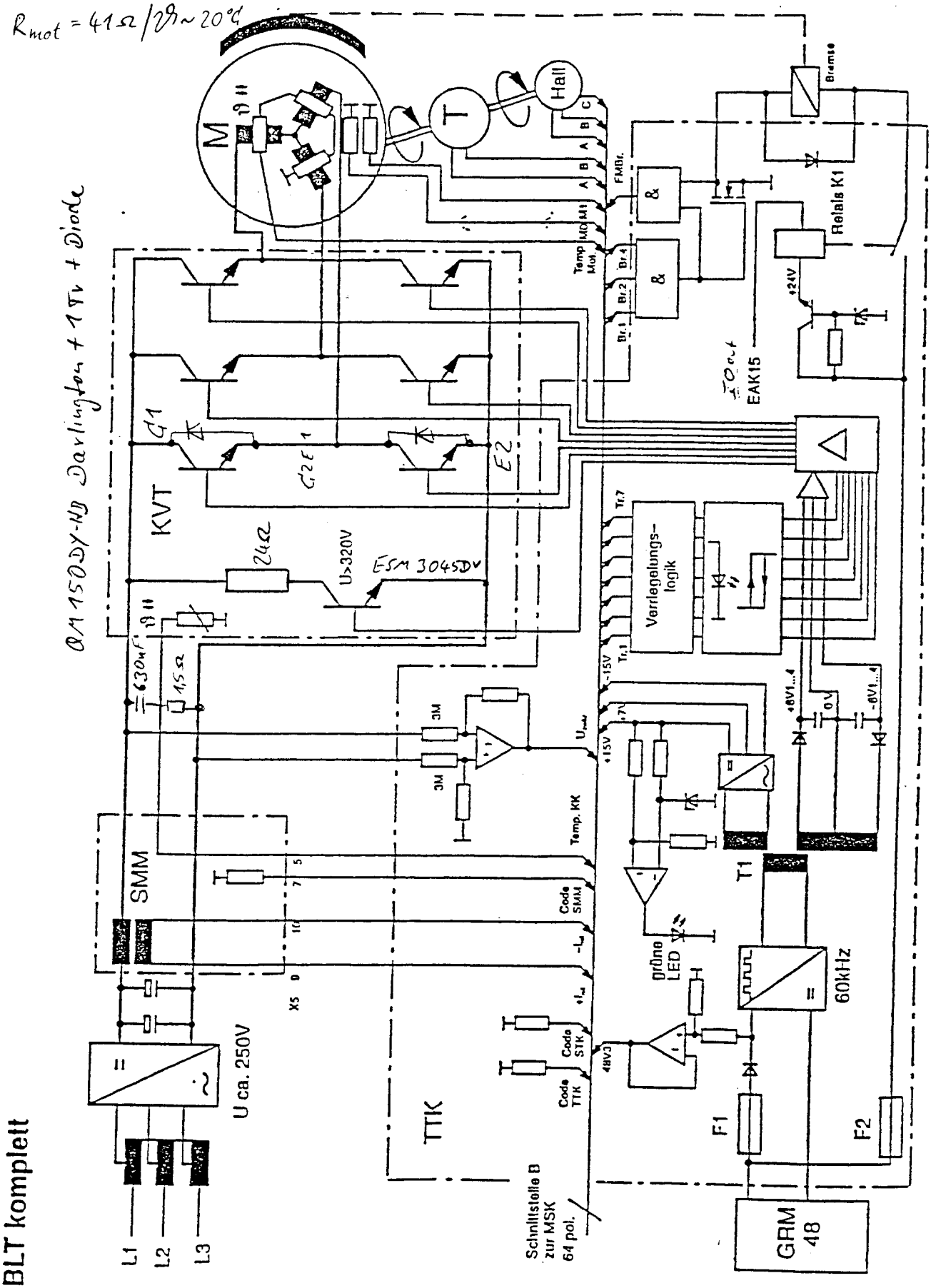
Kontakt-Nr.	Funktion
1	GND
2	GND
3	GND
4	Bremse -
5	48 V 1
6	48 V 1
7	Bremse +
8	Code Motor Ø
9	Code Motor 1
10	Bremse EAK / I/O
11	Temp. Motor
12	Transistor 7

Bremse EAK: redundanter Bremsenzugriff, wirkt direkt auf Relais K1.

Stecker X4 12polige Binder-Kupplungsdose

Kontakt-Nr.	Funktion
A	Masse
B	Schirm
C	+ 15 V
D	+ 12 V
E	Hall A
F	Hall B
G	Hall C
H	Tacho A
J	Tacho B
K	
L	
M	

Gez.	Sachb.	Gen.	Ausgabe			



BLT komplett

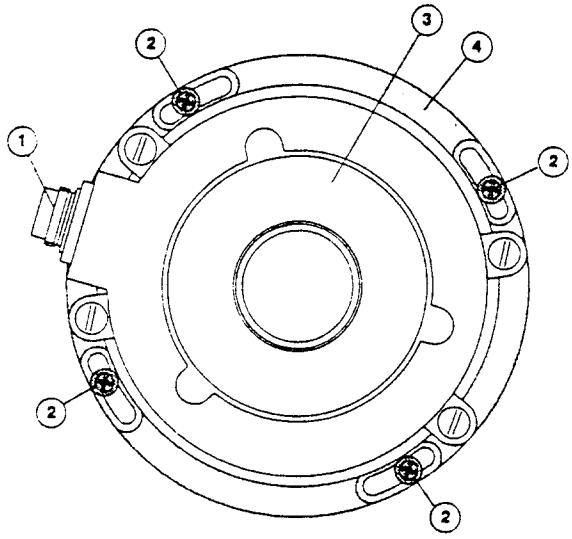
Rotor position encoder

The rotor position encoder consists of three components:

- sensors,
- rotating part,
- adjusting ring.

Attention:

Do not loosen the **safety screws** of the adjusting ring of the rotor position encoder!
Displacement of the adjusting ring results in **displacement of the rotor position encoder** in relation to the actual position of the rotor of the main motor.
If the adjusting ring **is not in its normal position** or is **defective**, the main motor **must be replaced!**

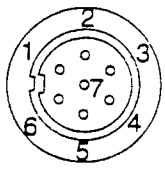


Front view of rotor position encoder

Design

① Pin base X2 / connection to BLT
② Safety screws of adjusting ring
③ Sensors
④ Adjusting ring

X2

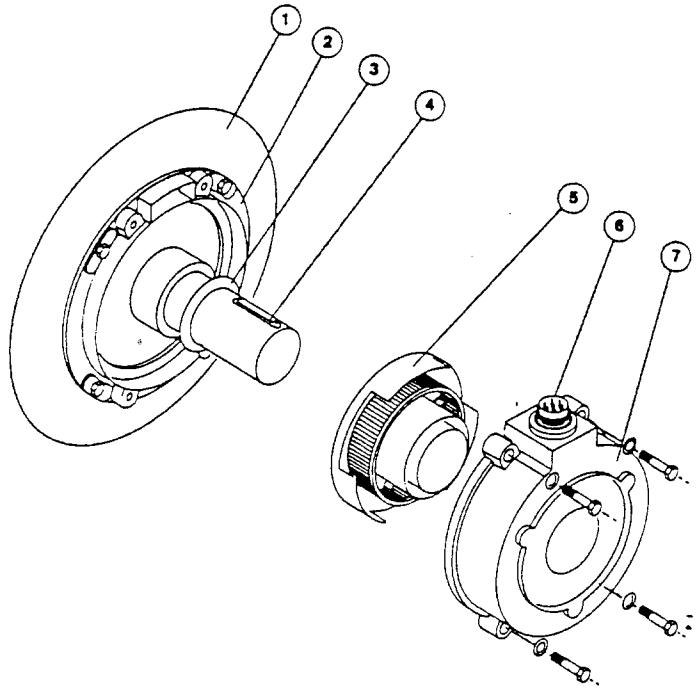


Pin base X2, 7–pole

Pin assignment

X2 Plug connection to ZSG (BLT)

Pin	Function
6	+ 15V DC
7	⊥ 15V



Rotor position encoder of main motor M1

① Motor casing/brake
② Adjusting ring
③ End–float washers (not always provided)
④ Motor shaft
⑤ Rotating part
⑥ Plug connector M1-X2
⑦ Sensors

Removal

❶ Turn off the main switch and make sure it cannot be turned on again.
❷ Remove plug connector X2.
❸ Remove the sensors (four fixing bolts).
❹ Replace the sensors or rotating part.

Note:

Put the end–float washers back in place between the rotating part and motor.

Installation

❺ Reinstall all parts and connect the rotor position encoder.

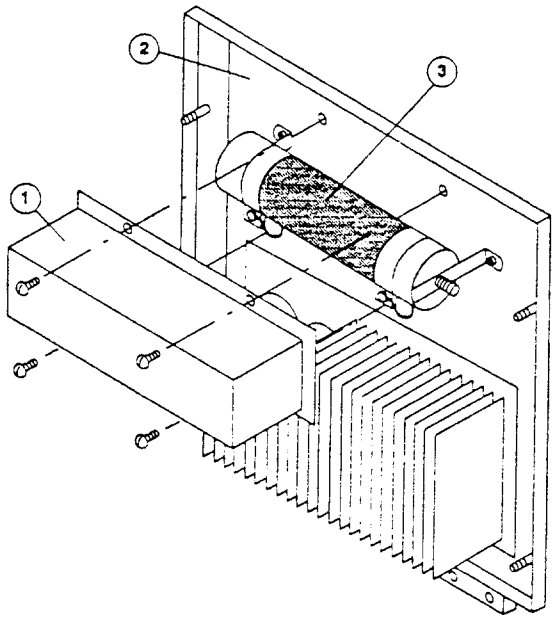
15R1 Chopper resistor

Attention:

- **High voltage!** Wait for the discharge time of the capacitors (3 min.) to elapse.

- **Danger – high temperatures!** Resistor can be very hot and cause burns.

Design



Reverse side of BLT1/2 with resistor 15R1

① Guard

② Reverse side of BLT 1/2

③ Chopper resistor 15R1

The resistor 15R1 is fitted under a guard on the reverse side of the brushless power part BLT 1/2. The guard prevents direct accidental contact.

The ohmic value of the chopper resistor 15R1 differs depending on the brushless power part:

BLT1 – 33 ohms

BLT2 – 22 ohms

Note:

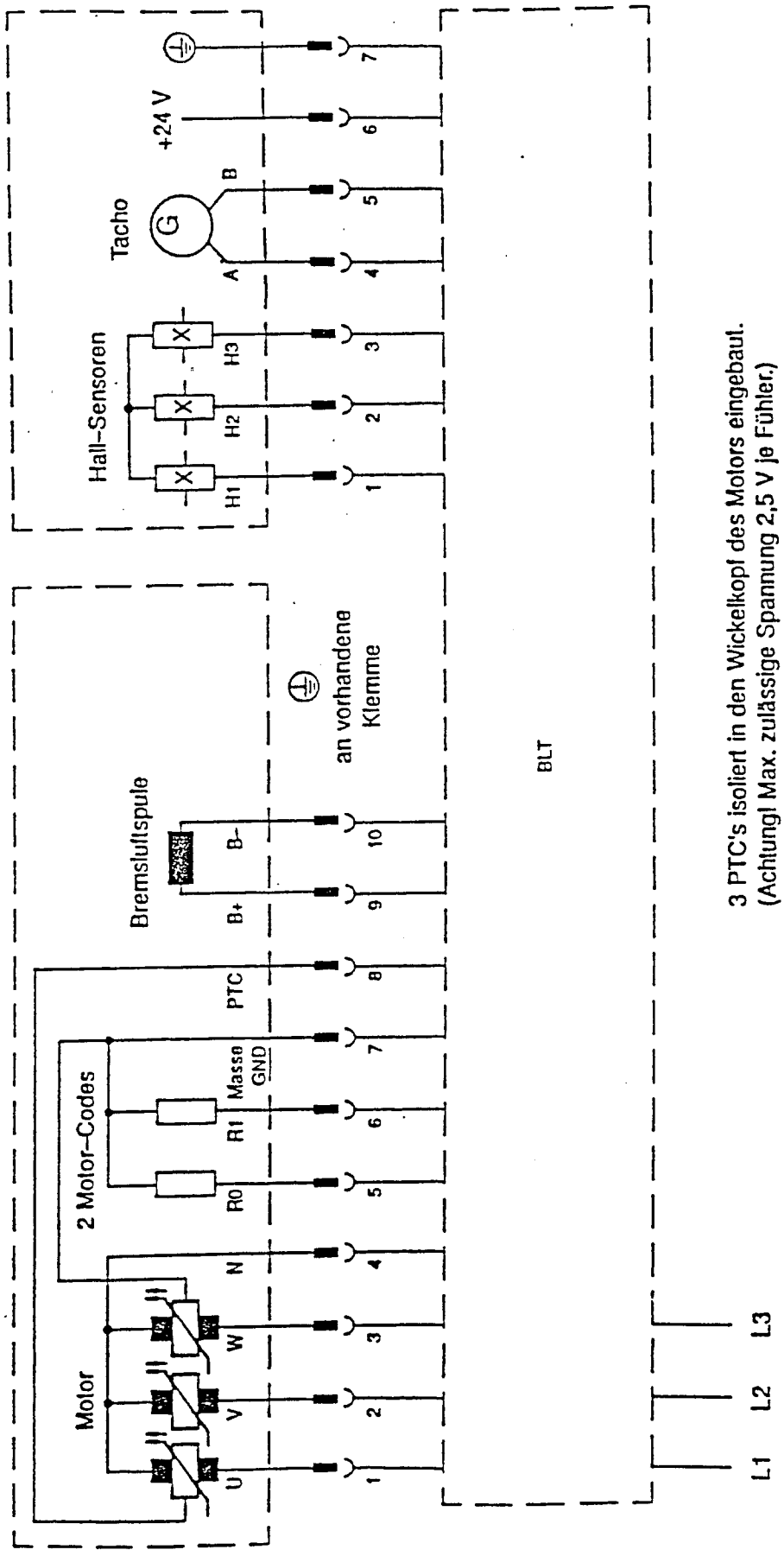
The connecting cables of the chopper resistor must be laid **as far away as possible** from the resistor body (**danger of short–circuit** caused by melting cables)

Function and connection

The chopper resistor 15R1 absorbs the energy which the main motor feeds back to the brushless power part BLT 1/2 and converts it into heat.

The chopper resistor 15R1 is connected through the plug X10 of the transistor driver board TTK.

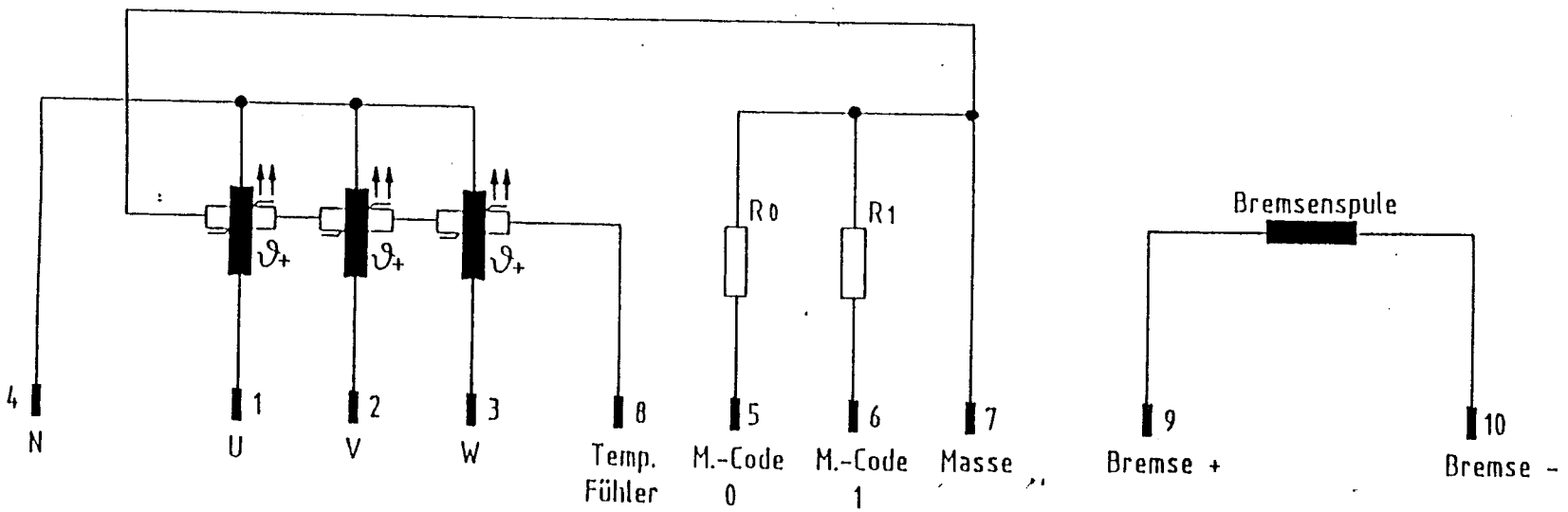
Anschlußschaltbild Motorstecker



Gez.	Sachb.	Gen.	Ausgabe
Flory			

1. Stecker Fa. Wieland (10 Pins) Imax = 35 A
2. Stecker Fa. Harting HAN-K4/8 (12 Pins) Imax = 80 A

Stecker siehe Spezifikation



⏚ an vorhandene Klemme

Heidelberger Druckmaschinen Aktiengesellschaft

Innenschaltbild gilt für BL-Hauptantrieb

D umentation Hauptantriebsparame.er

Setzer, 25.05.1994

Motorcodewiderstände :

R0 [kOhm]	Code-Nr.	ATB mit Bremse	ATB Mit Bremse	ATB	Baumüller mit Bremse	Baumüller mit Bremse	(Siemens) mit Bremse	Perma-Drive	Sonder-motoren	
0,22	1									
0,56	2		1,25 kW							High-Torque
1,2	3		2,5 kW					1,3 kW		
2,7	4		4,0 kW		2,5 kW			2,0 kW		
5,6	5	18,0 kW	6,0 kW		4,0 kW		4,0 kW	4,0 kW	4,0 kW-ATB	
12	6	22,0 kW	7,5 kW		6,0 kW	18,0 kW				
27	7	30,0 kW	11,0 kW		7,5 kW	22,0 kW	7,5 kW			
56	8	37,0 kW	15,0 kW		11,0 kW	30,0 kW				
120	9				15,0 kW	37,0 kW	37,0 kW			Systemtest
					18,0 kW					Drossel
R1 [kOhm]		0,22	0,56	1,2	2,7	5,6	12	27	56	120
Code-Nr.		1	2	3	4	5	6	7	8	9

Leistungsteilcodewiderstände :

KVT[kOhm]	Code-Nr.			TRK		TLK	TTK1	TTK2	UVM	
0,22	1									
0,56	2									
1,2	3			2,0 kW						
2,7	4									
5,6	5					4,0 kW				
12	6						7,5 kW			
27	7							15 kW		
56	8								37 kW	
120	9									
TTK [kOhm]		0,22	0,56	1,2	2,7	5,6	12	27	56	120
Code-Nr.		1	2	3	4	5	6	7	8	9

Dokumentation Hauptantriebsparameter

Setzer, 25.05.1994

Motoren :

Hersteller	M1\M0	Pn [kW]	RMot [Ohm]	LMot [mH]	I [A]	di [A]	EMK [V]	Drehzahl [min-1]	Baugröße	MaxTemp [°C]	Polzahl	Tacho Imp \ Spuren	Maschine (*voraussichtlich)
ATB	1 \ 5	18,00	-0,27	-2,55	70	11,2	-370	3000	BG132	160	3	128 \ 2	
ATB	1 \ 6	22,00	-0,13	-2,55	85	13,6	-370	3000	BG160	160	3	128 \ 2	
ATB	1 \ 7	30,00	0,08	1,12	120	19,2	-370	3000	BG160	160	3	128 \ 2	
ATB	1 \ 8	37,00	-0,07	-1,12	145	24	-370	3000	BG160	160	3	128 \ 2	
ATB	2 \ 2	1,25	-0,5	-6	12	2	160	3000	BG80	160	3	128 \ 2	
ATB	2 \ 3	2,50	-0,4	-4,8	22	3,5	160	3000	BG80	160	3	128 \ 2	
ATB	2 \ 4	4,00	-0,3	-3	32	5	160	3000	BG100	160	3	128 \ 2	
ATB	2 \ 5	6,00	0,288	1,83	46	7,5	160	3000	BG100	160	3	128 \ 2	MOZ \ GTOZ-S \ A4*
ATB	2 \ 6	7,50	0,165	1,37	62	10	160	3000	BG132	160	3	128 \ 2	GTOV-S \ GTOF-S
ATB	2 \ 7	11,00	-0,15	-1,2	88	14	160	3000	BG132	160	3	128 \ 2	
ATB	2 \ 8	15,00	-0,12	-1	115	18	160	3000	BG132	160	3	128 \ 2	
Baumüller	4 \ 3	2,50	-0,58	-4,35	22	3,5	-160	3000	BG80	160	3	128 \ 2	
Baumüller	4 \ 4	4,00	-0,29	-2,6	32	5	-160	3000	BG80	160	3	128 \ 2	
Baumüller	4 \ 5	6,00	-0,18	-2	46	7,5	-160	3000	BG80	160	3	128 \ 2	
Baumüller	4 \ 6	7,50	0,12	1,65	62	10	160	3000	BG100	160	3	128 \ 2	M1* \ G2*
Baumüller	4 \ 7	11,00	0,8	1,2	88	14	160	3000	BG100	160	3	128 \ 2	
Baumüller	4 \ 8	15,00	0,05	1,05	115	18	160	3000	BG100	160	3	128 \ 2	M2 \ G4*
Baumüller	4 \ 9	18,00	-0,05	1,05	130	21	-160	3000	BG100	160	3	128 \ 2	
Baumüller	5 \ 5	18,00	0,134	3	70	11,2	370	3000	BG100	160	3	128 \ 2	
Baumüller	5 \ 6	22,00	0,118	2,4	85	13,6	370	3000	BG132	160	3	128 \ 2	SP95-2Farben*
Baumüller	5 \ 7	30,00	0,061	2,25	120	19,2	370	3000	BG132	160	3	128 \ 2	
Baumüller	5 \ 8	37,00	0,05	1,8	145	23,2	370	3000	BG132	160	3	128 \ 2	M4 \ SP95-4Farben*
Siemens	6 \ 4	4,00	1,12	8,6	19	2,9	-370	5000	BG100	160	3	128 \ 2	G1*
Siemens	6 \ 6	7,50	1	9	35	5,9	-370	5000	BG100	160	3	128 \ 2	
Piller	6 \ 8	37,00	-0,05	-0,9	-145	23,2	370	3000	BG132	160	3	128 \ 2	
Perma-Drive	7 \ 2	1,30	2,1	11,8	15	1,7	185	5000	BG80	100	2	kein Tacho	
Perma-Drive	7 \ 3	2,00	2,3	14,6	15	1,7	266	5000	BG80	100	2	kein Tacho	A1 \ A1-2Farben*
VEM	7 \ 4	4,00	0,41	3	19	2,9	-370	5000	BG100	160	3	128 \ 2	G1*
ATB	8 \ 4	4,00	2,4	12	19	2,9	370	3000	BG100	160	3	128 \ 2	GTOE-Einzelbogen
High-torque	9 \ 1		2,55	15	8	1	50	2000					H. Hügel
Systemtest	9 \ 8	3,00	-0,3	-4	25	4	160	3000			3	128 \ 2	P1M3-Systemtest
Drossel	9 \ 9		0,08	3,75	120	25,5	50	3000	Drossel		3	Simuliert	DV \ Funktionstest

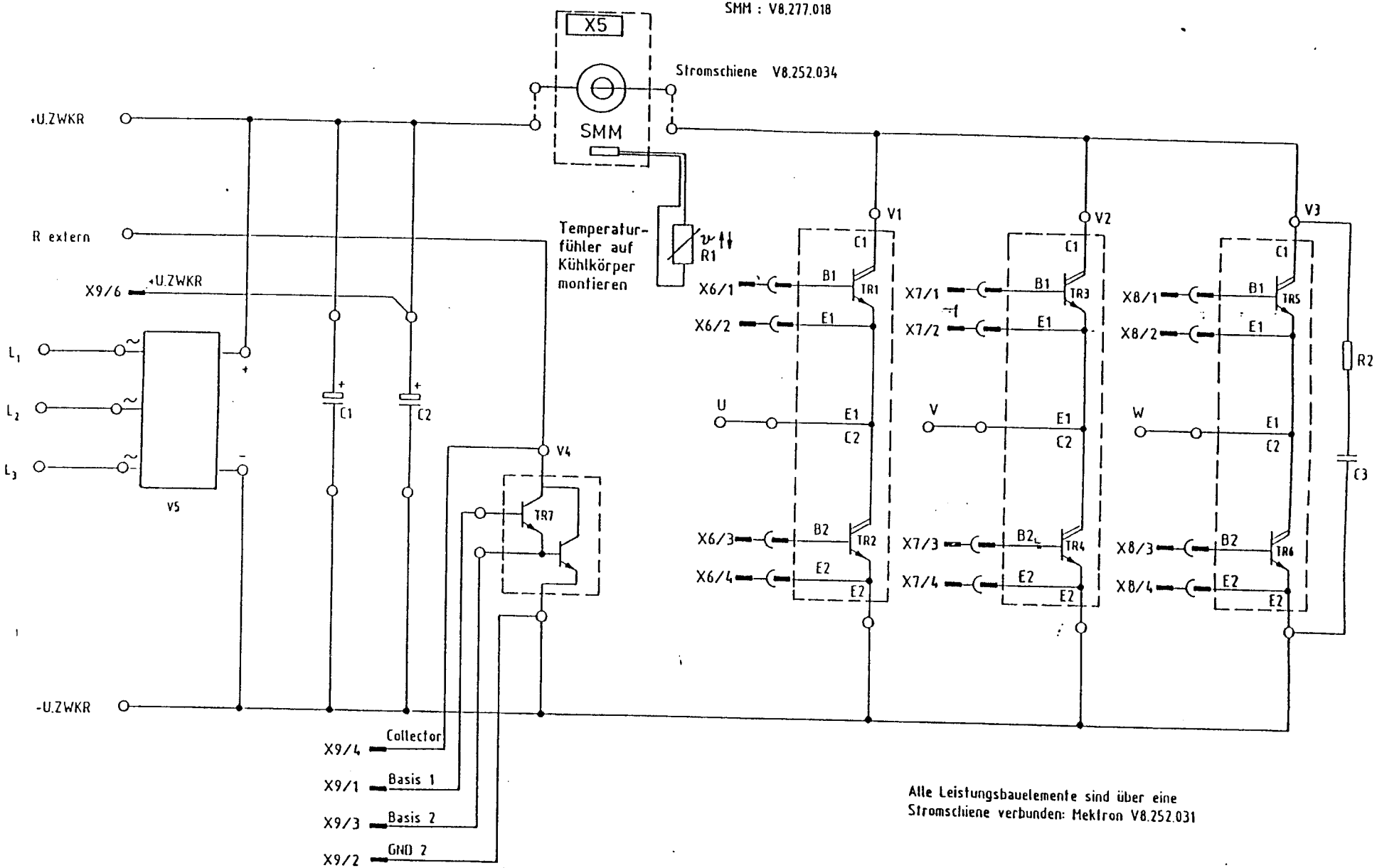
D umentation Hauptantriebsparame.er

Setzer, 27.05.1994

Leistungsteile :

Name	TTK / KVT	Pn [kW]	U Nenn [V]	Kapazität ZWK [µF]	I TTK [A]	I KVT [A]	I SMM [A]	ü Messmodul	Shunt Messmodul [Ohm]	Maschine (*voraussichtlich)
TRK	TRK 3 \ 3	2,0	300	1320	13	10	10	1:1000	511	A1 \ A1-2Farben
TLK	TLK 5 \ 5	4,0	552	495	20	20	38	1:1000	100	G1*
BLT1	TTK1 \ SMM1 6 \ 6	7,5	252	1080	62	62	76	1:2000	100	M1* \ G2* \ A4*
BLT2	TTK2 \ SMM2 7 \ 7	15,0	252	3000	130	120	150	1:2000	50	M2* \ G4*
BLT4	UVM \ AVM 8 \ 8	37,0	552	1500	200	145	150	1:2000	50	M4

SMM : V8.277.018



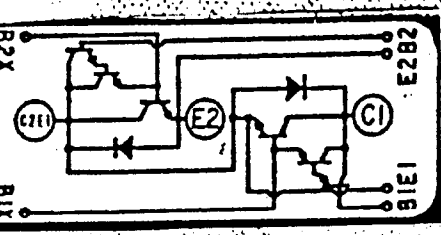
Alle Leistungsbauelemente sind über eine Stromschiene verbunden: Mektron V8.252.031

V1, V2, V3, und V5 sind auf gemeinsamen Kühlkörper montiert

Heidelberger Druckmaschinen Aktiengesellschaft	Typ	DI. Nr.	HDM-Nr.	Dat.
				Name
Urheberschutzvermerk nach DIN 34		Ersatz für		And.
Kühlkörper-Verbindungs-Teil 1				Zeichnungs-Nr.

BLT 12

TYPE QM150DY-HB
NO. N47AA60
MITSUBISHI ELECTRIC CORPORATION JAPAN



C1 - C2E1	354Ω
C2E1 - C1	∞
C2E1 - E2	354Ω
E2 - C2E1	∞
C1 - E2	699Ω
E2 - C1	∞
B1 - E1	16Ω
E1 - B1	∞

B2x / B1x not used

Aufgabe	Maschine	Hpr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	Kommentar
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STK	2	1	
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STM	6	1	
Anleger Hauptstapel	Speedmaster	1	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	Notbetrieb
Anleger Hauptstapel	MO	1	Baumüller 500W	2	6			LTK 500 HDM	3	11	
Anleger Hauptstapel	MO	1	ZF10 Flender-Himmel	8				STK	2	10	
Anleger Hauptstapel	GTO	1	ZF10 Flender-Himmel	8				STM	6	10	
Anleger Hauptstapel	GTO	1	Groschopp	8	4		236	LTK 50	5	12	
Anleger Hauptstapel	MS	1	Groschopp	8	4		236	LTM 100	7	18	
Anleger Hauptstapel	MS	1	ZF13 Flender-Himmel	2				STM	6	1	
Anleger Hilfsstapel	Speedmaster	1	ZF10 Flender-Himmel	8				STM	6	10	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STK	2	1	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STM	6	1	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF10 Flender-Himmel	2				STK	2	10	
Anleger Hilfsstapel	GTO	3	ZF10 Flender-Himmel	8				STM	6	10	
Anleger Hilfsstapel	MS	3	Groschopp	8	4		236	LTK 50	5	12	nur Versuch
		3	Groschopp	8	4		236	LTM 100	7	18	
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	8							
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	2				STK	2	1	
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			STM	6	1	
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	Notbetrieb
Ausleger Hauptstapel	MO	2	ZF10 Flender-Himmel	8				LTK 500 HDM	3	11	
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	STK	2	10	
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	LTK 50	5	12	
Ausleger Hauptstapel	MS	2	ZF13 Flender-Himmel	2				LTM 100	7	18	
Ausleger Hilfsstapel	Speedmaster	2	ZF10 Flender-Himmel	8				STM	6	1	Hochausleger
Ausleger Hilfsstapel	Speedmaster	4	EBM 50 W/Papst 60 W	5	4	74	2564	STM	6	10	Normalausleger
		4	EBM 50 W/Papst 60 W	5	4	74	2564	LTK 50	5	6	
Saugwalze	Speedmaster	11	Papst 50 W	6	4		25	LTM 100	7	19	
Saugwalze	Speedmaster	12	Papst 50 W	6	4		25	LTK 50	5	7	
Saugwalze	MO	13	Neckar 20 W	6	4		18	LTK 50	5	7	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTK 50	5	7	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTK 50	5	7	
Saugwalze	Speedmaster SN	10	Groschopp	8	4		25	LTM 100	7	20	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTK 50	5	12	
								LTM 100	7	16	
Heber	Speedmaster	40	Papst 50 W	6	4	74	60	LTK 50	5	7	
Heber	Speedmaster	41	Papst 50 W	6	4	74	60	LTK 50	5	7	
Heber	Speedmaster	42	Papst 50 W	6	4	74	60	LTK 50	5	7	
Heber	Speedmaster	40	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Heber	Speedmaster	41	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Heber	Speedmaster	42	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Heber	MO	43	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Heber	GTO	44	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	

Aufgabe	Maschine	Motor_Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	Kommentar
Alcolor	Speedmaster	20	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	21	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	22	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	20	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	21	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	22	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Alcolor	Speedmaster	20	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Alcolor	Speedmaster	21	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Alcolor	Speedmaster	22	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Alcolor	Speedmaster	20	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Alcolor	Speedmaster	21	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Alcolor	Speedmaster	22	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Alcolor	Speedmaster	20	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Alcolor	Speedmaster	21	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Alcolor	Speedmaster	22	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Alcolor	Speedmaster	20	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Alcolor	Speedmaster	21	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Alcolor	Speedmaster	22	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Alcolor	MO	23	EBM 50 W/Papst 60 W	5	4	74	16	LTK 50	5	6	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	16	LTK 50	5	6	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	16	LTM 100	7	19	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTM 300	8	15	
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 Hauser/HDM	4	5	Notbetrieb
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 Hauser/HDM	4	5	Notbetrieb
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 HDM	3	4	
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	60	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	61	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	62	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	60	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	61	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	62	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	
Lackwerk	Speedmaster	60	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	61	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	62	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	60	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	61	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	62	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	
Lackwerk	Speedmaster	60	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Lackwerk	Speedmaster	61	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Lackwerk	Speedmaster	62	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	
Lackwerk	Speedmaster	60	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Lackwerk	Speedmaster	61	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Lackwerk	Speedmaster	62	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	
Lackwerk	MO	63	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	

Aufgabe	Maschine	Hpro_Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	Kommentar
Lackwerk	GTO	64	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	
Saugbändertisch	Speedmaster	80	EBM 50 W SGT	2	4			LTK 50	5	14	nur Versuch
Saugbändertisch	Speedmaster	81	EBM 50 W SGT	2	4			LTK 50	5	14	nur Versuch
Saugbändertisch	Speedmaster	82	EBM 50 W SGT	2	4			LTK 50	5	14	nur Versuch
Saugbändertisch	MO	83	EBM 50 W SGT	2	4			LTK 50	5	14	nur Versuch
Saugbändertisch	GTO	84	EBM 50 W SGT	2	4			LTK 50	5	14	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTM 100	7	9	
DAS	WEB	5		9				STK	2	13	
DAS	M600	6		9				STK	2	13	
Bahnbefeuchtung	WEB	85	Papst 50 W	6	4	74	60	LTK 50	5	7	
Bahnbefeuchtung	M600	86	Papst 50 W	6	4	74	60	LTK 50	5	7	
Bahnbefeuchtung	WEB	85	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Bahnbefeuchtung	M600	86	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 Hauser/HDM	4	5	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 Hauser/HDM	4	5	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 HDM	3	4	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 HDM	3	4	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 250V	9	6	100	59	LTM 1000	9	8	
Farbduktor	M600	96	Baumüller 1kW 250V	9	6	100	51	LTM 1000	9	8	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTM 300	8	17	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 HDM	3	4	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 Hauser/HDM	4	5	

Antrieb	Sachnummer (RLH-NR.)	Leistung ab Getriebe [W]	Getriebe: Übersetzung Stufenzahl Art	Nenndaten Moment Getriebe [Nm]	Drehzahl Getriebe [1/min]	Strom Motor [A]	Leerlaufdaten Drehzahl Getriebe [1/min]	Drehzahl Motor [1/min]	max. Strom bei Raumtemp. [A]	Pol-zahl	Tacho J/N	Inkrementle P/P[%]	Code-Nr.	Wicklg.-Widerst. [Ohm]	Öl/Fett füllung	Bemerkungen	Vorgesehen bei ZE?	RLH mit Anh. geliefert
Saugwalze GTO/MO (IMS/NECKAR)	92.112.1321 /01	20	18 (18,36) 2 Planeten	1	270	1	305 -5%/10%	5600	0,35A n. 10s	4	N	/	6					
Saugwalze MS (Neckar/IMS)	M2.112.1311 (V8.506.003)	65	19 (19,2) 2 Planeten		155	2,4	220-245	4224-4704	0,95A n. 10s	4	N	/	9	2,25			x	
Saugwalze G-S (DUNKER ?)																	x	x 20.9.93
Saugw. Speedm. (Groschopp/Papst)	61.112.1311 /A	40	25 2 Stirnrad	2,5	120	1,7	175-200 2	4375-5000	0,8A n. 20s	4	N	/	6	2,922 RT=24°	Calypsol D6024 40cm³	momentan mechanisch ev. SRA		
Saugw. Speedm. (Groschopp/Papst) verstärkte Ausf.	61.112.1341	55	25 2 Stirnrad	4	120	1,9	140-165	3500-4125	0,8A n. 20s	4	N	/	6	2,922 RT=24°C				
Saugwalze SN (Grosch./Grosch.)	N2.112.1311	50	25 2 Stirnrad	4,5	100	1,85	128 +/-	3200 +/-	0,4A n. 10s	4	N	/	8			farbige Kennzeichnung 331.- verst. 363.- wird nicht gebaut		
Saugw. SP 95 (NECKAR/NECKAR)	(V8.506.005)	120	17,5 2 Stirnrad	6,5	180						N	/	9					x 20.9.93
Farbduktor GS (IMS/EBM)	V8.....	120	60 3 Stirnrad	12	65	4,2			0,9A n. 10s	8	J	64 40-60	4			LTM 300/LTK 500 48V Zwischenkreis		x H. Hügel
Farbduktor MS (CYCLO-EBM)	M2.186.5121 (V8.506.001)	250	43 1 Cycloid	35	65	3,2	82-90	3526-3870	1,1A n. 20s	6	J	64 40-60	7	1,15			x	x 20.9.93

Lfd. Nr.	Antrieb	Sachnummer (RLH-NR.)	Leistung an Getriebe [W]	Getriebe Übersetzung Stufenzahl Art	Nenndaten Moment Getriebe [Nm]	Nenndaten Drehzahl Getriebe [1/min]	Nenndaten Strom Motor [A]	Leerlaufdaten Drehzahl Getriebe [1/min]	Leerlaufdaten Drehzahl Motor [1/min]	Leerlaufdaten max. Strom bei Raumtemp. [A]	Pol-zahl	Tacho J/N	Inkre-mente P/PI%	Code-Nr.	Wickl.-Widerst. [Ohm]	Öl-Füllung	Bemerkungen	Vorge-hen bei ZB ?	RLH mit Anlf. geliefert
	Gebläse Bänderanleger GTO / GS / MS (EBM)	98.179.1911	50 an Lüfter-rad	entfällt	/	/	2	/	5000 +-10% 4500-5500	1,5 (Öffn. ab gedeckt) nach 10s	4	N	/	2					
	Blasleiste Alcolor GS / MS / SP95 (EBM)	M2.179.1921																	
	Saugbürste CD Drehstrom (Neckar/IMS)	C2.163.1401	16	18 (18,36) 2 Planeten		144	0,15	55 +/-10	2900	0,12	2	N	/	/					
	Autopila Rollenförder- u. Andruckbalkenantrieb (Neckar/IMS)	C2.129.1511 M663P60193		93 (92,7) 3 Planten								N	/				-mit Bremse 24V-		
	Tangentialgebläse MS-Mod. Kühlung BLT	M2.115.2501																	
	Vollautom. Wendung GS / MS / SP95																		

Blatt 4/4 Maaß/EA 20.09.1993

Antrieb	Sachnummer (RLH-NR.)	Leistung ab Getriebe [W]	Getriebe: Übersetzung Stufenzahl, Art	Nenndaten: Moment Getriebe [Nm]	Drehzahl Getriebe [1/min]	Strom Motor [A]	Leerlaufdaten: Drehzahl Getriebe [1/min]	Drehzahl Motor [1/min]	max. Strom bei Raumtemp. [A]	Hol-zahl	Tacho J/N	Inkre-mente P/P[%]	Code-Nr.	Wickl.-Widerst. [Ohm]	Öl/Fett füllung	Bemerkungen	Vorge-sehen bei ZF ?	RLH intern gelöscht
Stapelhub GTO (Groschopp/IMS)	98.105.1311	55	236 3 Planeten	35	W1=10 W2=18	2	W1:12-14 W2:20-22,	2832-3304 4720-5310	W1=0,6A W2=0,9A nach 10s	4 --	N	/	8		Mindest-fettfüll.	-mit Bremse 24V-	x	
Stapelantrieb GS / A4 (SWF)	Typ 403383																	
Hilfsstapel Speedm. (Bauer/EBM)	C6.105.1101	30	2564 ? Schnecke/Stirn	ca. 150	1-1,3	2	1-1,3	2564-3333	1,1A n. 10s	4	J	74 55-75	5		,35/,061 Ar. Deg. BMB680			
Stapelantr. ZF10.1-3 (Flender-Himmel)													8			mit Bremse Drehstrom		
Stapelantr. ZF13.1-3 (Flender-Himmel)													2			mit Bremse Drehstrom		
Stapelantr. Speedm. (Baumüller)	61.105.1321	500/800	100	300									2			mit Bremse		

Widerstandcodes	
1	220 Ohm
2	560 Ohm
3	1,2 kOhm
4	2,7 kOhm
5	5,6 kOhm
6	12 kOhm
7	27 kOhm
8	56 kOhm
9	120 kOhm

Wird bei Änderung nicht unbedingt aktualisiert !

Verteiler: H.Firlus, H.Geiger, H.Hirning, H.Kirchhoff/H.Spilger, H.Kremp/H.Tögel, H.Lehnert, H.Wilhelm

- ✓V8.506.001 Farbduktor MS EBM/CYCLO
- ✓ V8.506.002 ALCOLOR MS Baumüller
- ✓ V8.506.003 Saugwalze MS NECKAR
- V8.506.004 Stapelhub GS / A4 SWF
- ✓V8.506.005 Saugwalze SP 95 NECKAR
- V8.506.006 ALCOLOR SP 95
- ✓V8.506.007 ALCOLOR GS IMS / EBM
- ✓V8.506.008 Farbduktor GS IMS / EBM

Antrieb	Sachnummer (RLH-NR.)	Leistung ab Getr. [W]	Getriebe: Übersetzung Stufenzahl Art	Nenndaten Moment Getriebe [Ncm]	Nenndaten Drehzahl Getriebe [1/min]	Nenndaten Strom Motor [A]	Leerlaufdaten Drehzahl Getriebe [1/min]	Leerlaufdaten Drehzahl Motor [1/min]	Leerlaufdaten max. Strom bei Raumtp [A]	Pol-zahl	Tacho J/N	Inkremente P/P[%]	Code-Nr.:	Wickl.-Widerst. [Ohm]	Öl/Fett füllung	Bemerkungen	Vorgabe bei ZB?	RLH m. Anh. geliefert
Alcolor GTO (Heynau/EBM)	98.198.1253	50	20 2 Stirnrad	3	150	2	145-165	2900-3300	0,8A n.10s	4	J	74 55-75	5	3,029 RT=25°C	80cm³	entfallen ab ca. Mitte 93	x	
Alcolor GTO (IMS/EBM)	89.198.1283	50	20 2 Stirnrad	3	150	2	170-190	3400-3800	0,9A n. 10s	4	J	74 55-75	5	3,029 RT=25°C		ersetzt 98.198.1253	x	
Alcolor GS (IMS/EBM)	V8.....	120	20 2 Stirnrad		180					8	/	/	4			LTM 300 / LTK 500 mit 48V		X H. Müller
Alcolor MO (Heynau/EBM)	63.198.1253 /01A	50	16,13 3 Stirnrad	1,8	187	2	185 +/-5%	175-195	0,8A n. 10s	4	J	74 55-75	5		80cm³	entfallen ab ca. 1/92	x	
Alcolor MO (IMS/Papst)	63.198.1283	50	16 3 Stirnrad	1,8	150	2	20 +/-10% 198-244	3168-3904	0,9A n. 10s	4	J	74 55-75	5		80cm³	ersetzt 63.198.1253/01A		
Alcolor u. Lackwerk Speedmaster / SP 95 (Heyn./Ziehl-Abegg)	61.198.1243	500	13 2 Stirnrad	18	230	4,5	275-313	3575-4069	1,4A n. 20s	4	J	74 55-75	3		120cm³ Shell Omal220		x	
Alcolor MS Lackierwerk MS(?) (Baumüller)	M2.198.1283 (V8.506.002)	250	13 2 Stirnrad	9	280	3,1	330-360	4290-4680	0,9A n. 10s	6	J	64	8	45Ω			x	X 20.9.93
Alcolor WEB ? (Baumüller)		630											7					
Alcolor Speedmaster (Bauer/Mavilor)	61.198.1343	500	12,117 2 Stirnrad	15	247	4,8	320-360	3877-4362	1,1A n. 20s	8	J	64	4	1,283 RT=21°C		entfallen	/	/
Alcolor Speedmaster (Mavilor/Mavilor)	61.198.1443	500	12,28 2 Stirnrad	15	244	4,8	320-360	3877-4362	1,1A n. 20s	8	J	64	4			entfallen	/	/
Heberfeuchtwerk MO (Heynau/EBM)	63.178.1153	50	60 3 Stirnrad	8	50	2	50 +/-5%	2850-3150	0,8A n. 10s	4	J	74 55-75	5		gemäß Zeichn.	entfallen ab ca. Mitte 93	x	
Heberfeuchtwerk MO (IMS/EBM)	63.178.1183	50	60 3 Stirnrad	8	50	2	55-63	3300-3780	0,8A n. 10s	4	J	74	5					
Heberfeuchtwerk Speedmaster (Bauer/Papst)	61.178.1343 /A	40	59,2 3 Stirnrad	7	50,7	1,7	66 +/-15%	3320-4493	1,25A n. 20s	4	J	74	6	3,25 RT=24°C	gemäß Zeichn.	-läuft aus f. Bogenm. -Bahnbefeuchtung M600		

Kor ıation Aufgabe, Maschine mit HAK2 oder Kor .xt 15.08.93

Aufgabe	Maschine	Hpro_Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	CPT	Kommentar
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STK	2	1	m	
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STM	6	1	k	
Anleger Hauptstapel	Speedmaster	1	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	m	
Anleger Hauptstapel	Speedmaster	1	Baumüller 500W	2	6			LTK 500 HDM	3	11	m	
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STK	2	1	m	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STM	6	1	k	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF10 Flender-Himmel	2				STK	2	10	m	
Anleger Hilfsstapel	Speedmaster	3	ZF10 Flender-Himmel	8				STM	6	10	k	
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	8				STK	2	1	m	
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	2				STM	6	1	k	
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	m	Notbetrieb
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			LTK 500 HDM	3	11	m	
Ausleger Hilfsstapel	Speedmaster	4	EBM 50 W/Papst 60 W	5	4	74	2564	LTK 50	5	6	m	
Ausleger Hilfsstapel	Speedmaster	4	EBM 50 W/Papst 60 W	5	4	74	2564	LTM 100	7	19	k	
Anleger Hauptstapel	MO	1	ZF10 Flender-Himmel	8				STK	2	10	m	
Anleger Hauptstapel	MO	1	ZF10 Flender-Himmel	8				STM	6	10	k	
Ausleger Hauptstapel	MO	2	ZF10 Flender-Himmel	8				STK	2	10	m	
Anleger Hauptstapel	GTO	1	Groschopp	8	4		236	LTK 50	5	12	m	
Anleger Hauptstapel	GTO	1	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hilfsstapel	GTO	3	Groschopp	8	4		236	LTK 50	5	12	m	nur Versuch
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	LTK 50	5	12	m	
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hauptstapel	MS	1	ZF13 Flender-Himmel	2				STM	6	1	k	
Anleger Hauptstapel	MS	1	ZF10 Flender-Himmel	8				STM	6	10	k	Notbetrieb
Anleger Hauptstapel	MS	1	ZF13 Flender-Himmel	2				STK	2	1	m	
Anleger Hauptstapel	MS	1	ZF10 Flender-Himmel	8				STK	2	1	m	Notbetrieb
Anleger Hilfsstapel	MS	3	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hilfsstapel	MS	3	Groschopp	8	4		236	LTK 50	5		m	
Ausleger Hauptstapel	MS	2	ZF13 Flender-Himmel	2				STM	6	1	k	Hochausleger
Ausleger Hauptstapel	MS	2	ZF10 Flender-Himmel	8				STM	6	10	k	Normalausleger
Ausleger Hauptstapel	MS	2	ZF13 Flender-Himmel	2				STK	2		m	Hochausleger
Ausleger Hauptstapel	MS	2	ZF10 Flender-Himmel	8				STK	2		m	Normalausleger
Saugwalze	Speedmaster	11	Papst 50 W	6	4		25	LTK 50	5	7	m	
Saugwalze	Speedmaster	12	Papst 50 W	6	4		25	LTK 50	5	7	m	
Saugwalze	Speedmaster SN	10	Groschopp	8	4		25	LTK 50	5	12	m	

Aufgabe	Maschine	Hpro Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	CPT	Kommentar
Saugwalze	MO	13	Neckar 20 W	6	4		18	LTK 50	5	7	m	
Saugwalze	MO	13	Neckar 20 W	6	4		18	LTM 100	7	20	k	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTK 50	5	7	m	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTM 100	7	20	k	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTM 100	7	16	k	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTK 500 HDM	3	13	m	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTK 500 Hauser/HDM	4	13	m	
Heber	Speedmaster	40,41,42	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Heber	Speedmaster	40,41,42	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Heber	MO	43	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Heber	GTO	44	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Alcolor	Speedmaster	20,21,22	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	m	
Alcolor	Speedmaster	20,21,22	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	m	
Alcolor	Speedmaster	20,21,22	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	m	
Alcolor	Speedmaster	20,21,22	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	m	
Alcolor	Speedmaster	20,21,22	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	m	
Alcolor	Speedmaster	20,21,22	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	m	
Alcolor	MO	23	EBM 50 W/Papst 60 W	5	4	74	16	LTK 50	5	6	m	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	20	LTM 100	7	19	k	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTM 300	8	15	k	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTK 500 HDM	3	21	m	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTK 500 Hauser/HDM	4	21	m	
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 HDM	3	4	m	
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	m	
Lackwerk	Speedmaster	60,61,62	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	m	
Lackwerk	Speedmaster	60,61,62	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	m	
Lackwerk	Speedmaster	60,61,62	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	m	
Lackwerk	MO	63	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	
Lackwerk	GTO	64	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	

Ko ·ation Aufgabe, Maschine mit HAK2 oder Ko kt 15.08.93

Aufgabe	Maschine	Hpro_Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	CPT	Kommentar
Saugbändertisch	Speedmaster	80,81,82	EBM 50 W SGT	2	4			LTK 50	5	14	m	nur Versuch
Saugbändertisch	MO	83	EBM 50 W SGT	2	4			LTK 50	5	14	m	nur Versuch
Saugbändertisch	GTO	84	EBM 50 W SGT	2	4			LTK 50	5	14	m	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTM 100	7	9	k	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTK 500 HDM	3	11	m	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTK 500 Hauser/HDM	4	11	m	
Bahnbefeuchtung	WEB	85	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Bahnbefeuchtung	WEB	85	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Bahnbefeuchtung	M600	86	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Bahnbefeuchtung	M600	86	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 HDM	3	4	m	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 250V	9	6	100	59	LTM 1000	9	9	m	
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 HDM	3	4	m	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 250V	9	6	100	51	LTM 1000	9	8	m	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTM 300	8	17	k	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTK 500 HDM	3	22	m	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTK 500 Hauser/HDM	4	22	m	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 HDM	3	4	m	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 Hauser/HDM	4	5	m	

...ination Aufgabe, Maschine mit HAK2 oder ...pakt 19.08.93

Aufgabe	Maschine	Hpro_Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	CPT	Kommentar
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STK	2	1	m	
Anleger Hauptstapel	Speedmaster	1	ZF13 Flender-Himmel	2				STM	6	1	k	
Anleger Hauptstapel	Speedmaster	1	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	m	
Anleger Hauptstapel	Speedmaster	1	Baumüller 500W	2	6			LTK 500 HDM	3	11	m	
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STK	2	1	m	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF13 Flender-Himmel	2				STM	6	1	k	Notbetrieb
Anleger Hilfsstapel	Speedmaster	3	ZF10 Flender-Himmel	8				STK	2	10	m	
Anleger Hilfsstapel	Speedmaster	3	ZF10 Flender-Himmel	8				STM	6	10	k	
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	2				STK	2	1	m	
Ausleger Hauptstapel	Speedmaster	2	ZF13 Flender-Himmel	2				STM	6	1	k	
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			LTK 500 Hauser/HDM	4	11	m	Notbetrieb
Ausleger Hauptstapel	Speedmaster	2	Baumüller 500W	2	6			LTK 500 HDM	3	11	m	
Ausleger Hilfsstapel	Speedmaster	4	EBM 50 W/Papst 60 W	5	4	74	2564	LTK 50	5	6	m	
Ausleger Hilfsstapel	Speedmaster	4	EBM 50 W/Papst 60 W	5	4	74	2564	LTM 100	7	19	k	
Anleger Hauptstapel	MO	1	ZF10 Flender-Himmel	8				STK	2	10	m	
Anleger Hauptstapel	MO	1	ZF10 Flender-Himmel	8				STM	6	10	k	
Anleger Hauptstapel	MO	1	ZF13 Flender-Himmel	2				STK	2	1	m	Notbetrieb
Anleger Hauptstapel	MO	1	ZF13 Flender-Himmel	2				STM	6	1	k	Notbetrieb
Anleger Hilfsstapel	MO	3	ZF10 Flender-Himmel	8				STK	2	10	m	
Anleger Hilfsstapel	MO	3	ZF10 Flender-Himmel	8				STM	6	10	k	
Anleger Hilfsstapel	MO	3	ZF13 Flender-Himmel	2				STK	2	1	m	Notbetrieb
Anleger Hilfsstapel	MO	3	ZF13 Flender-Himmel	2				STM	6	1	k	Notbetrieb
Ausleger Hauptstapel	MO	2	ZF10 Flender-Himmel	8				STK	2	10	m	
Ausleger Hauptstapel	MO	2	ZF13 Flender-Himmel	2				STM	6	1	k	Notbetrieb
Anleger Hauptstapel	GTO	1	Groschopp	8	4		236	LTK 50	5	12	m	
Anleger Hauptstapel	GTO	1	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hilfsstapel	GTO	3	Groschopp	8	4		236	LTK 50	5	12	m	nur Versuch
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	LTK 50	5	12	m	
Ausleger Hauptstapel	GTO	2	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hauptstapel	MS	1	ZF13 Flender-Himmel	2				STM	6	1	k	
Anleger Hauptstapel	MS	1	ZF13 Flender-Himmel	2				STK	2	1	m	
Anleger Hilfsstapel	MS	3	Groschopp	8	4		236	LTM 100	7	18	k	
Anleger Hilfsstapel	MS	3	Groschopp	8	4		236	LTK 50	5		m	
Ausleger Hauptstapel	MS	2	ZF13 Flender-Himmel	2				STM	6	1	k	Hochausleger
Ausleger Hauptstapel	MS	2	ZF10 Flender-Himmel	8				STM	6	10	k	Normalausleger
Ausleger Hauptstapel	MS	2	ZF13 Flender-Himmel	2				STK	2		m	Hochausleger

Aufgabe	Maschine	Hpro Nr	Motor	CM	Pol	Tacho	Getriebe	Leistungsteil	CLT	Index	CPT	Kommentar
Ausleger Hauptstapel	MS	2	ZF10 Flender-Himmel	8				STK	2		m	Normalausleger
Saugwalze	Speedmaster	11	Papst 50 W	6	4		25	LTK 50	5	7	m	
Saugwalze	Speedmaster	12	Papst 50 W	6	4		25	LTK 50	5	7	m	
Saugwalze	Speedmaster SN	10	Groschopp	8	4		25	LTK 50	5	12	m	
Saugwalze	MO	13	Neckar 20 W	6	4		18	LTK 50	5	7	m	
Saugwalze	MO	13	Neckar 20 W	6	4		18	LTM 100	7	20	k	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTK 50	5	7	m	
Saugwalze	GTO	14	Neckar 20 W	6	4		18	LTM 100	7	20	k	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTM 100	7	16	k	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTK 500 HDM	3	13	m	
Saugwalze	MS	15	Neckar 65W	9	4		25	LTK 500 Hauser/HDM	4	13	m	
Heber	Speedmaster	40,41,42	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Heber	Speedmaster	40,41,42	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Heber	MO	43	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Heber	GTO	44	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Alcolor	Speedmaster	20,21,22	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	m	
Alcolor	Speedmaster	20,21,22	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	m	
Alcolor	Speedmaster	20,21,22	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	m	
Alcolor	Speedmaster	20,21,22	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	m	
Alcolor	Speedmaster	20,21,22	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	m	
Alcolor	Speedmaster	20,21,22	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	m	
Alcolor	MO	23	EBM 50 W/Papst 60 W	5	4	74	16	LTK 50	5	6	m	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	
Alcolor	GTO	24	EBM 50 W/Papst 60 W	5	4	74	20	LTM 100	7	19	k	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTM 300	8	15	k	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTK 500 HDM	3	21	m	
Alcolor	MS	27	Baumüller 250W	8	6	64	13	LTK 500 Hauser/HDM	4	21	m	
Alcolor	GS	28	EBM 150 W	4	6		20	LTM 300	8	23	k	
Alcolor	GS	28	EBM 150 W	4	6		20	LTK 500 Hauser/HDM	4	5	m	
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Alcolor	WEB	25	Baumüller 1 kW 120V	4	6		9,53	LTK 500 HDM	3	4	m	
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Alcolor	M600	26	Baumüller 1 kW 120V	4	6		9	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Eldynor	4	8	64	12,117	LTK 500 Hauser/HDM	4	5	m	

Aufgabe	Maschine	Hpro Nr	...otor	CM	Pol	Tacho	Getrie...	Leistungsteil	CLT	Index	CPT	Kommentar
Lackwerk	Speedmaster	60,61,62	Marvilor	4	8	64	12,28	LTK 500 Hauser/HDM	4	5	m	
Lackwerk	Speedmaster	60,61,62	Ziehl-Abegg	3	4	74	13	LTK 500 Hauser/HDM	4	3	m	
Lackwerk	Speedmaster	60,61,62	Eldynor	4	8	64	12,117	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Marvilor	4	8	64	12,28	LTK 500 HDM	3	4	m	
Lackwerk	Speedmaster	60,61,62	Ziehl-Abegg	3	4	74	13	LTK 500 HDM	3	2	m	
Lackwerk	MO	63	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	
Lackwerk	GTO	64	EBM 50 W/Papst 60 W	5	4	74	20	LTK 50	5	6	m	
Saugbändertisch	Speedmaster	80,81,82	EBM 50 W SGT	2	4			LTK 50	5	14	m	nur Versuch
Saugbändertisch	MO	83	EBM 50 W SGT	2	4			LTK 50	5	14	m	nur Versuch
Saugbändertisch	GTO	84	EBM 50 W SGT	2	4			LTK 50	5	14	m	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTM 100	7	9	k	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTK 500 HDM	3	11	m	
Saugbändertisch	MS	87	EBM 50 W SGT	2	4			LTK 500 Hauser/HDM	4	11	m	
Saugbändertisch	GS	88	EBM 50 W SGT	2	4			LTM 100	7	9	k	
Bahnbefeuchtung	WEB	85	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Bahnbefeuchtung	WEB	85	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Bahnbefeuchtung	M600	86	Papst 50 W	6	4	74	60	LTK 50	5	7	m	
Bahnbefeuchtung	M600	86	EBM 50 W/Papst 60 W	5	4	74	60	LTK 50	5	6	m	
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 120V	4	6	100	59	LTK 500 HDM	3	4	m	Notbetrieb
Farbduktor	WEB	95	Baumüller 1kW 250V	9	6	100	59	LTM 1000	9	8	m	
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 Hauser/HDM	4	5	m	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 120V	4	6	100	51	LTK 500 HDM	3	4	m	Notbetrieb
Farbduktor	M600	96	Baumüller 1kW 250V	9	6	100	51	LTM 1000	9	8	m	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTM 300	8	17	k	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTK 500 HDM	3	22	m	
Farbduktor	MS	97	EBM 250W	7	6	74	43	LTK 500 Hauser/HDM	4	22	m	
Farbduktor	GS	98	EBM 150 W	4	6		60 20	LTM 300	8	23	k	
Farbduktor	GS	98	EBM 150 W	4	6		60 20	LTK 500 Hauser/HDM	4	5	m	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 HDM	3	4	m	
Harmonic-Drive	M600	30	Baumüller 1kW 120V	4	6	100	?	LTK 500 Hauser/HDM	4	5	m	

Motor	Leistungsteil	Widerstand	Code	min. Zeit	Soll-Zeit	max. Zeit
frei	kein		0			
frei	frei	0,22 kOhm	1	0,053 ms	0,119 ms	0,183 ms
ZF13 Flender-Himmel, Baumüller 500W, EBM 50W SGT	STK	0,56 kOhm	2	0,183 ms	0,302 ms	0,424 ms
Ziehl-Abegg	LTK 500 HDM	1,20 kOhm	3	0,424 ms	0,648 ms	0,931 ms
(Eldynor/Marvilor), Baumüller 1kW 120V, EBM 150W	LTK 500 Hauser/ HDM	2,70 kOhm	4	0,931 ms	1,460 ms	2,100 ms
(EBM 50W/Papst 60W)	LTK 50	5,60 kOhm	5	2,100 ms	3,020 ms	4,240 ms
Papst 50W, Neckar 20W, ATB 1kW 250V	STM	12,00 kOhm	6	4,240 ms	6,480 ms	9,320 ms
EBM 250W	LTM 100	27,00 kOhm	7	9,320 ms	14,580 ms	20,060 ms
ZF10 Flender-Himmel, Groschopp, Baumüller 250W	LTM 300	56,00 kOhm	8	20,060 ms	30,240 ms	42,340 ms
Neckar 65 W, Baumüller 1kW 250V, Neckar 120W	LTM 1000	120,00 kOhm	9	42,340 ms	64,800 ms	87,260 ms

Hauptprogrammnummern Nebenantriebe 15.08.93 Kir

Hpro-Nr	Aufgabe	Maschine
52	frei	
53	frei	
54	frei	
55	frei	
56	frei	
57	frei	
58	frei	
59	frei	
60	Lackwerk	Speedmaster 102
61	Lackwerk	Speedmaster 72
62	Lackwerk	Speedmaster CD
63	Lackwerk	MO
64	Lackwerk	GTO
65	Lackwerk	Web
66	Lackwerk	M600
67	Lackwerk	MS
68	Lackwerk	GS
69	frei	
70	frei	
71	frei	
72	frei	
73	frei	
74	frei	
75	frei	
76	frei	
77	frei	
78	frei	
79	frei	
80	Saugbändertisch	Speedmaster 102
81	Saugbändertisch	Speedmaster 72
82	Saugbändertisch	Speedmaster CD
83	Saugbändertisch	MO
84	Saugbändertisch	GTO
85	Bahnbefeuchtung	Web
86	Bahnbefeuchtung	M600
87	Saugbändertisch	MS
88	Saugbändertisch	GS
89	frei	
90	Farbduktor	Speedmaster 102
91	Farbduktor	Speedmaster 72
92	Farbduktor	Speedmaster CD
93	Farbduktor	MO
94	Farbduktor	GTO
95	Farbduktor	Web
96	Farbduktor	M600
97	Farbduktor	MS
98	Farbduktor	GS
99	frei	
100-127	frei	

Hauptprogrammnummern Nebenantriebe 15.08.93 Kir

Hpro-Nr	Aufgabe	Maschine
0	keine	keine
1	Anleger Hauptstapel	alle
2	Ausleger Hauptstapel	alle
3	Anleger Hilfsstapel	alle
4	Ausleger Hilfsstapel	alle
5	DAS	Web
6	DAS	M600
7	frei	
8	frei	
9	frei	
10	Saugwalze	Speedmaster 102, SN
11	Saugwalze	Speedmaster 72
12	Saugwalze	Speedmaster CD
13	Saugwalze	MO
14	Saugwalze	GTO
15	Saugwalze	MS
16	frei	
17	frei	
18	frei	
19	frei	
20	Alcolor	Speedmaster 102-
21	Alcolor	Speedmaster 72
22	Alcolor	Speedmaster CD
23	Alcolor	MO
24	Alcolor	GTO
25	Alcolor	Web
26	Alcolor	M600
27	Alcolor	MS
28	Alcolor	GS
29	frei	
30	Harmonic-Drive	M600
31	frei	
32	frei	
33	frei	
34	frei	
35	frei	
36	frei	
37	frei	
38	frei	
39	frei	
40	Heber	Speedmaster 102
41	Heber	Speedmaster 72
42	Heber	Speedmaster CD
43	Heber	MO
44	Heber	GTO
45	Heber	Web
46	Heber	M600
47	frei	
48	frei	
49	frei	
50	frei	
51	frei	

File: HPRO_SRA.DOC

Kir 13.08.93

Hilfsantriebe mit 6-poliger Schnittstelle:

Die sogenannten selbstregelnden Antriebe (SRA) sind an der 6-poligen Schnittstelle des ZSK/A-Teils und an der EWK zu verwenden. Die Zuordnung entnehmen Sie der Konfiguration von Herrn Stadler. Diese Konfiguration ist nach Maschinentyp festgelegt.

Die Hauptprogrammnummer (hpro_sra) wird vom übergeordnetem System übertragen.

hpro_sra:	Aufgabe:	Maschine:	max. Drehzahl: U/min
0	keine	--	--
1	KLM	MS	6200
2	SLM Anleger Haupt	GS	--
3	SLM Ausleger	GS	

Bedienung des Sauggebläse mit KLM:

befcn_sra:	Bedeutung:
0	Gebläse aus
1	Gebläse ein, wobei die Variable pot_eing_sra (0 - 100 %) die Drehzahl bestimmt, die abhängig von der max. Drehzahl ist.

Bedienung Anlegerhautstapel mit SLM

befcn_sra	Reaktion des Motors
0	Motor hält an
1	Motor fährt aufwärts
2	Motor fährt abwärts
3	Wenn der Tastfuss am Anleger Papier anfordert fährt der Anlegerstapel 100 ms aufwärts. Dieser Vorgang wird solange wiederholt bis keine Papieranforderung mehr anliegt.

PWM wird zu klein bei danerhafte Motorüberlast bei 25% Solldrehzahl, wenn nicht erreicht,

Fehlerbit	Anzeige	ZF10/13	BL - Stapel 500W	BL- Stapel 50W	Feucht/Lackw	Saugwalze	SGT/Farbd/Harm/BBF
0	7FFE	Stillstand +	Stillstand +	Stillstand +	1	1	1 Freigabe weg
1	7FFD	Drehrichtung +	Drehrichtung +	Drehrichtung +	1	1	1
2	7FFB	Blockierung +	1	Stecker +	Stecker	Stecker	Stecker
3	7FF7	Drehzahl +	Drehzahl +	Drehzahl +	Stillstand / Drehmoment	1 2	1
4	7FEF	Thermo (FM) / Stellg.	Thermo / Stecker	1	1	Überstrom +	1
5	7FDF	1	LT - Fehler (EM)	LT - Fehler (FM)	1	1	1
6	7FBF	1	Blockierung +	Blockierung +	1	1	1
7	7F7F	Übertragung	Übertragung	Übertragung	Übertragung	Übertragung	Übertragung
8	7EFF	1 aber belegt	1 aber belegt	1	1	1	1
9	7DFF	1 aber belegt	1 aber belegt	1 aber belegt	1	1	1
A	7BFF	1	1 aber belegt	1	1	1	1
B	77FF	1	1	1	1	1	1
C	6FFF	1	1	1	1	1	1
D	5FFF	1	1	1	1	1	1
E	3FFF	1	1	1	1	1	1
F	7FFF	Blinkbit	Blinkbit	Blinkbit	Blinkbit	Blinkbit	Blinkbit

Stellgr Motor

Motorlastpedalierung Freigabe gesperrt bis FM weg ist

Wann wird Stillstandsüberwachung aktiv. Bremsen ein sollen?

+ Aus Ein

Index	Motor	CM	Leistungsteil	CLT
0	-		-	
1	ZF13 Flender-Himmel	2	STK, STM	2 , 6
2	Ziehl-Abegg	3	LTK 500 HDM	3
3	Ziehl-Abegg	3	LTK 500 Hauser/HDM	4
4	(Eldynor/Marvilor)	4	LTK 500 HDM	3
4	Baumüller 1 kW 120V	4	LTK 500 HDM	3
5	(Eldynor/Marvilor)	4	LTK 500 Hauser/HDM	4
5	Baumüller 1 kW 120V	4	LTK 500 Hauser/HDM	4
6	EBM 50 W/Papst 60 W	5	LTK 50	5
7	Papst 50W	6	LTK 50	5
7	Neckar 20W	6	LTK 50	5
8	Baumüller 1 kW 250V	9	LTM 1000	9
9	EBM 50W SGT	2	LTM 100	7
10	ZF10 Flender-Himmel	8	STK, STM	2 , 6
11	Baumüller 500W	2	LTK 500 HDM	3
11	Baumüller 500W	2	LTK 500 Hauser/HDM	4
12	Groschopp	8	LTK 50	5
13	Neckar 65W	9	LTK 50	5
14	EBM 50W SGT	2	LTK 50	5
15	Baumüller 250W	8	LTM 300	8
16	Neckar 65W	9	LTM 100	7
17	EBM 250W	7	LTM 300	8
18	Groschopp	8	LTM 100	7
19	EBM 50 W/Papst 60 W	5	LTM 100	7
20	Neckar 20W	6	LTM 100	7
21	Baumüller 250 W	8	LTK 500 Hauser/HDM	4
22	EBM 250 W	7	LTK 500 Hauser/HDM	4

GTO CPTRONIC
M–Offset Z CPTRONIC

Stand 10/92

Hauptantriebssteuerung für Bürstenlose Hauptmotoren M1

Maschinen Typ	Hersteller Codierung HDM Nr. MSK Software	BLT Strom HDM–Nr.	Strom–grenze	TTK Codierung HDM–Nr.	KVT (75A) Codierung HDM–Nr.	SMM (75A) HDM–Nr.	KVT mit SMM (75A) HDM–Nr.	Bemerkung
GTO Z	HDM 89 98.144.5021/02 002	75A 98.101.1051	33 A	06 98.144.1101	06 98.144.1061	98.144.1071	98.101.1061	
GTO V GTO F	HDM 89 98.144.5021/02 002	75A 98.101.1051	62 A	06 98.144.1101	06 98.144.1061	98.144.1071	98.101.1061	Stromgrenze für GTO V mit SW 007 von 34–62A
MO Z	HDM 89 98.144.5021/02 002	75A 98.101.1051	46 A	06 98.144.1101	06 98.144.1061	98.144.1071	98.101.1061	

Verkauf Technischer Service
• Elektronik Schulung •

Hauptmotoren Zuordnung
Bürstenlose Antriebe

HEIDELBERG

GTO CPTRONIC
M–Offset Z CPTRONIC

Stand 10/92

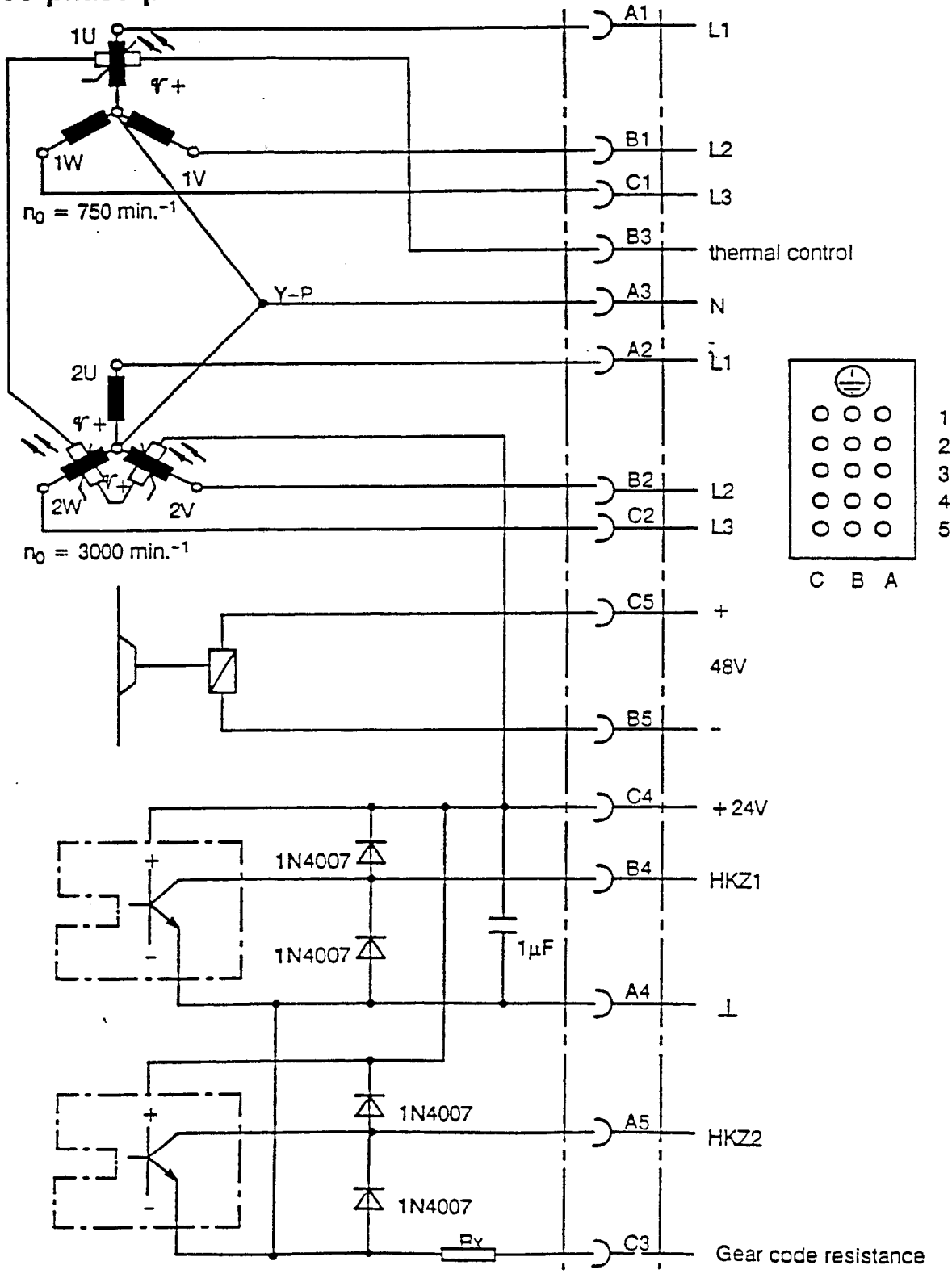
Hauptmotor M1 Bürstenlos

Maschinen	Hersteller Typ Codierung HDM Nr.	Leistung (kW) Pab	Bremse Typ	Rotorlagegeber Geber HDM–Nr.	Justagering HDM–Nr.	Rotorteil HDM–Nr.	Fußpedal zur Bremslüftung HDM–Nr.	Bemerkung
GTO Z	ATB HM100 U/11 25 53.101.2005	6	LS22; 27 Nm	63.101.1211	63.101.1221	63.101.1231	89.090.9157	Softwareseitig wird Leistung Pab auf 4 kW begrenzt
GTO V GTO F	ATB HM132S/–21 26 98.101.2005/05	7,5	LS60; 60 Nm	63.101.1211	63.101.1221	63.101.1231	89.090.9157	
MO Z	ATB HM100U/–11 25 53.101.2005	6	LS22; 27 Nm	63.101.1211	63.101.1221	63.101.1231	89.090.9157	

Auxiliary Drives

AC Auxiliary Drives

Three-phase pile drive



Connector pin assignment three-phase lifting motor as of 04/03/91

Connector pin assignment 11X5, 12X5 and 11X6:

Socket (male)

C	B	A
1	1	1
1W	1V	1U
yellow	green	red
2	2	2
2W	2V	2U
black/yellow	black/green	black/red
3	3	3
Motor code	Thermal monitoring	N1 + N2
green	blue1,5	black
4	4	4
Usupply +24V Halls + thermal monitoring	Hall 1	Hall 1 + 2 ground
red	blue 0,75	yellow
5	5	5
Brake +48V Usupply	Brake +48V Uswitch.	Hall 2
brown	grey	brown

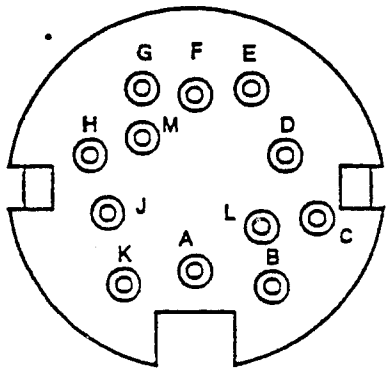
Plug (female)

A	B	C
1	1	1
1U	1V	1W
black 1	black 4	black 7
2	2	2
2U	2V	2W
black 2	black 5	black 8
3	3	3
N1 + N2	Thermal monitoring	motor code
black 3	green	grey
4	4	4
Hall 1 + 2 ground	Hall 1	Usupply + 24V Halls + thermal monitoring
white	yellow	rose
5	5	5
Hall2	Brake + 48V Uswitch.	Brake + 48V Usupply
black 6	black 9	white

Connector pin assignment 15X7, 15X12 and 15X8:

	z	b	d
2			
4		black 1 (1U)	
6		black 4 (1V)	
8		black 7 (1W)	
10		black 2 (2U)	
12		black 5 (2V)	
14		black 8 (2W)	
16		black 3 (N1 + N2)	
18			
20	black 9 (brake + 48V Usupply)		black 6 (brake + 48V Uswitch)
22		white (Halls 1 + 2 ground)	
24			
26	brown (Hall 2)	yellow (Hall 1)	green (thermal monitoring)
28	grey (motor code)		
30			rose (Usupply +24V Halls + thermal monitoring)
32			

Sheet slowdown operation MO/GTO

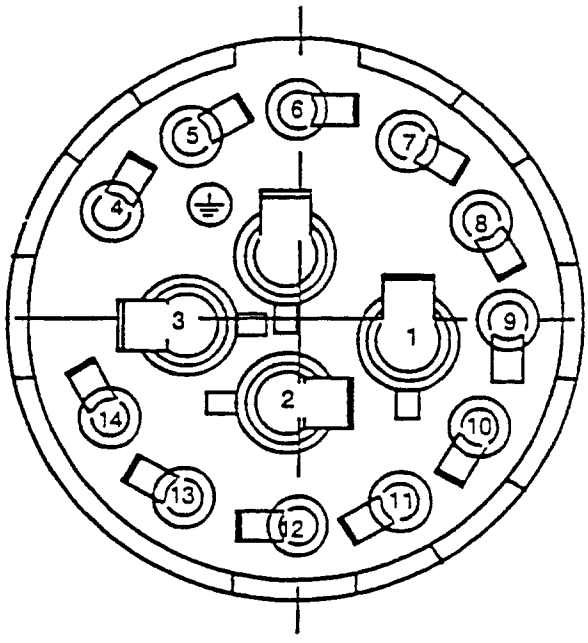


Connector pin assignment motor cable

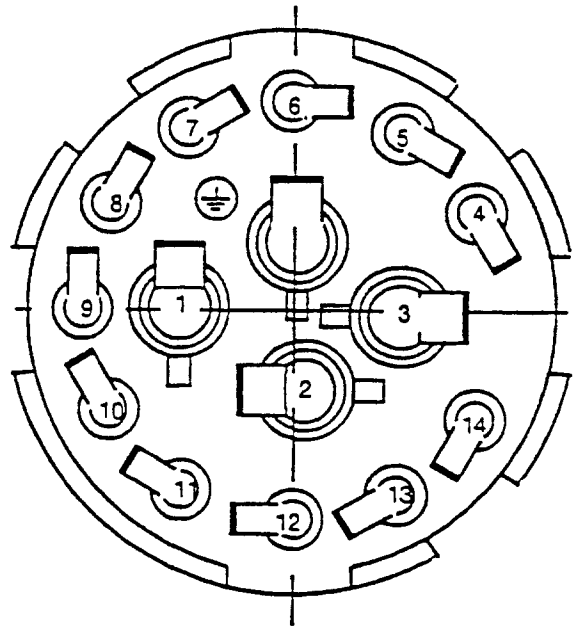
A	–	Position sensor 3
B	–	Position sensor 1
C	–	Position sensor 2
D	–	Code resistance R = 12 kOhm against ground
F	–	PE conductor
J	–	not used
K	–	+ 12V
L	–	ground
M	–	not used

Connector pin assignment motor side brushless motors 50W and 500W

Contact no.:	Function	Core colour
1	1U (X) motor wire	light blue 1
2	1V (Y) motor wire	light blue 2
3	1W (Z) motor wire	light blue 3
4	Position sensor	black/white
5	Encoder	blue/white
6	Position sensor	brown/white
7		grey/white
8	Position sensor	red/white
9	M (ground of UH)	violet/white
10	Reserve	
11	Motor code	pink/white
12	Reserve	
13	Reserve	
14	Reserve	
⏚	PE	green/yellow



Socket element



Plug element

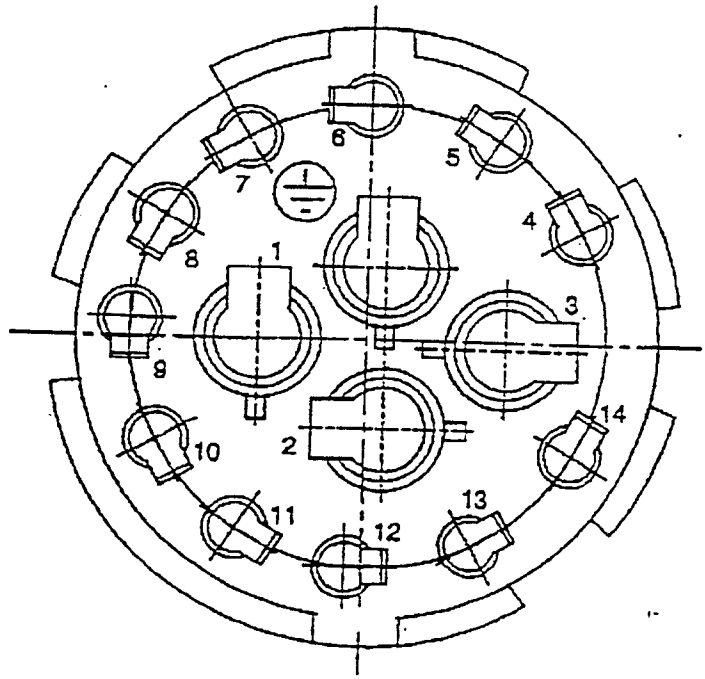
HEIDELBERG	Steckerbelegung: Amphenol–Stecker	TEZ 89.145.1751

Kontakt–Nr.	Funktion	Adernfarbe/Querschnitt
1 2 3	U1 – Motorleitung V1 – Motorleitung W1 – Motorleitung	schwarz blau braun
4 5 6 7 8 9 10 11 12 13 14	F – Hallgeber Bremse – D – Hallgeber + UH: 12V B – Hallgeber M (Masse von U_H) Bremse + CMO U2–Motorleitung schnell V2–Motorleitung schnell W2–Motorleitung schnell	beige gelb grün violett rosa orange transparent rot–weiß blau–weiß gelb–weiß grün–weiß
⏚	PE	gn/ge

Hinweis: Cu–Geflecht nicht anschließen

Amphenol –Tuchel
Kabeldose Serie C16–3
C016 10D 014 0031
HDM–Nr. 00.781.2111

Ansicht auf Anschlußseite
Kabeldoseneinsatz



Buchsenkontakt 0,14–0,5mm ^{2}
02 015 – 0005 (2)
HDM–Nr. 00.781.2116

Buchsenkontakt 0,5 – 1,5mm ^{2}
02 025 – 0001 (1)
HDM–Nr. 00.781.2118

Verschlußkappe
C016 00 V 000 0101

Buchsenkontakt 1,5 – 2,5mm^2
02–025–0010 (1)
HDM–Nr. 00.781.2120

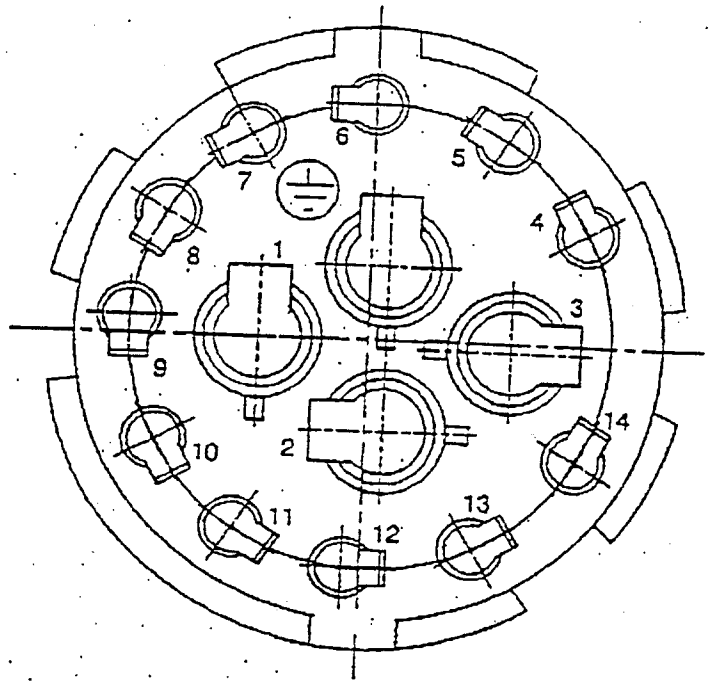
Gez.	Sachb.	Gen.	Ausgabe				
Egs.	Sta.		8.10.90				Blatt 2 von 3

Kontakt-Nr.	Funktion	Ademfarbe / Querschnitt
1 2 3	X-Motorleitung Y-Motorleitung Z-Motorleitung	schwarz 1 schwarz 2 schwarz3 } 1mm²
4 5 6 7 8 9 10 11 12 13 14	F-Hallgeber T-Hallgeber D-Hallgeber +UH:12V B-Hallgeber M (Masse von U_H Reserve $\overline{CMO}$ -- -- --	braun grün weiß grau gelb rosa blau rot } 0,25mm²
⏚	PE	gn/ge 2,5mm²

Hinweis: Cu-Geflecht nicht anschließen

Amphenol-Tuchel
Kabeldose Serie C16-3
C016 10D 014 0031
HDM-Nr. 00.781.2111

Ansicht auf Anschlußseite
Kabeldoseneinsatz



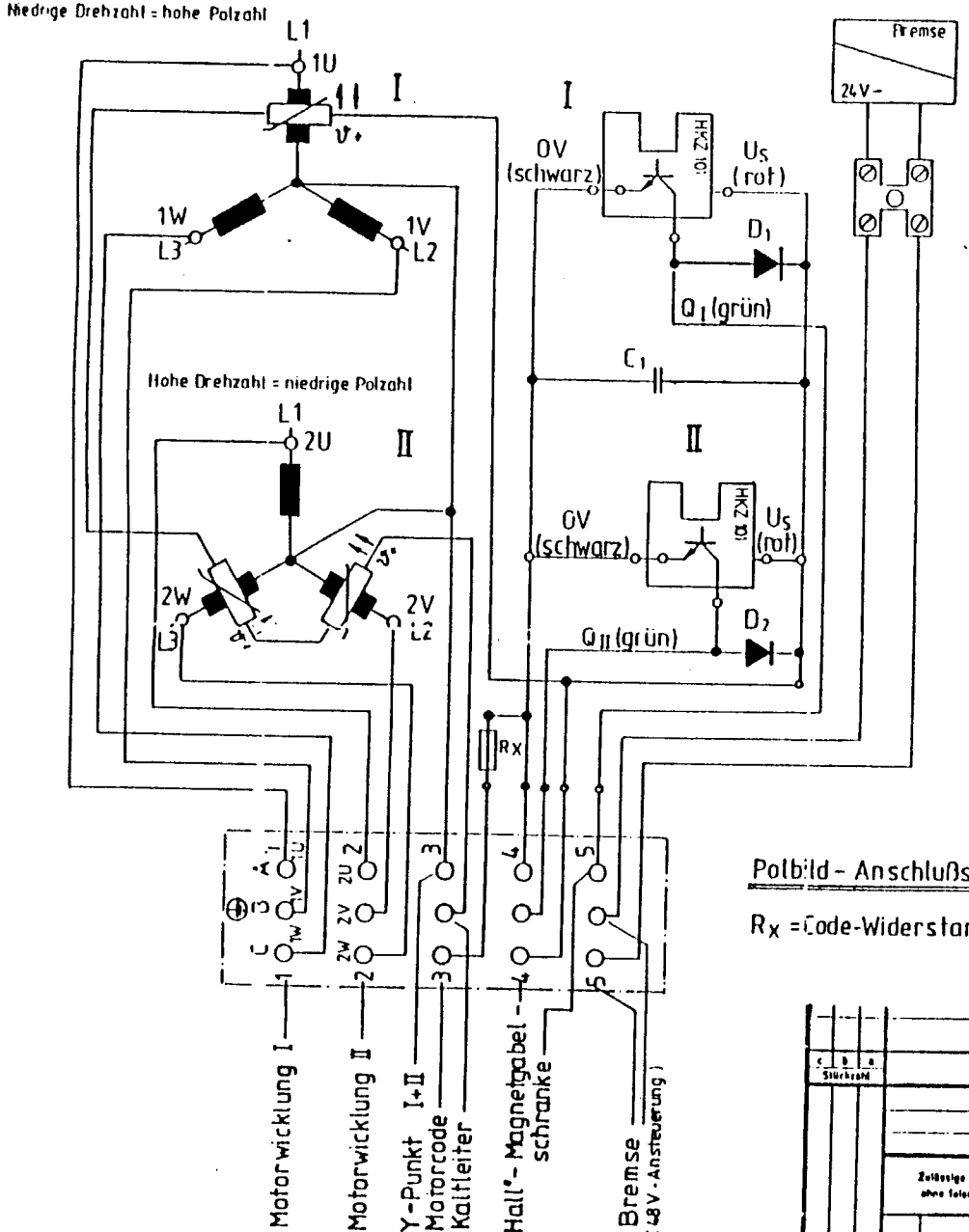
Buchsenkontakt 0,14-0,5mm²
02 015-0005 (2)
Hdm-Nr. 00.781.2116

Buchsenkontakt 0,5-1,5mm²
02 025-0001 (1)
HDM-Nr.00.781.2118

Verschlußkappe
C016 00 V 000 0101

Buchsenkontakt 1,5 - 2,5mm²
02-025-0010 (1)
HDM-Nr. 00.781.2120

Änderungsmitteilungs-Nummer B803750			Maßstab Format A4	Docu / SPT	Projektion
	Datum	Name	Benennung		Erst-erstellung 03.08.89 ST
Bearb.	24.08.92	Mayr	Steckerbelegung Amphenol-Stecker		
Gepr.	24.08.92	Wippert			
Norm					Blatt-Nr. 002 / Ein-schub / Ausg. A
Heidelberger Druckmaschinen AG			Unterlagen-Nr. TEZ C6.145.3141/A		
Schutzvermerk DIN 34			Ersatz für		voriger Index



Anschluß: Magnetschranken - Adapter
(im Klemmenkasten gesteckt)

Polbild - Anschlußseite

R_X = Code-Widerstand

Stückzahl	Benennung	Normblatt Zchng.-Nr.	Werkstoff	Zchng. Pos.	Halbzeug Modell-Nr., Gewicht-Nr.	Bemerkungen Part. Gew. kg/Stück

Zulässige Abweichungen für Maße ohne Toleranzen DIN 7168 mittel	Oberfläche nach N 7118	Sach-Nr. 957089	Ordnungs-Nr. 9.5200
	1986 Datum Name Bea.: 22.08. Offerbach Gepr.: 27.1 Norm:	Benennung: Drehstrommotor mit 2 Drehzahlen 2 getrennte Wicklungen YY und Hall-Magnetgabelschranke+PTC	Pause-Nr.
Aus gabe	Änderung Tag Name	FLENDER HIMMEL	Zeichnungsnummer: A9868

Removal, installation brake pile motor

Before removing the brake take the load off the pile chain!
(Move the pile to the bottom limit stop)

Required tools

- medium-sized screw driver for slotted screws
- small pliers for retainer rings (outer retainer ring)
- Medium-sized extractor
- Side cutting pliers

Brake removal

Remove in the following sequence:

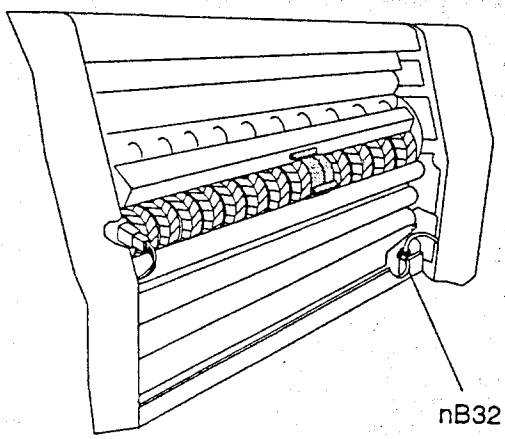
1) Remove the cover over the brake (4 slotted screws).
2) Take the retainer ring off the drive shaft.
3) Remove the segment disk (3 slotted screws).
4) Remove the segments from the drive shaft using the extractor.
5) Remove the spring washer from the drive shaft using the side cutting pliers.
6) Remove the retainer ring on the drive shaft, below the segment disks.
7) Unscrew the 3 holding screws of the brake (4 mm Allen screws, 2 screws being on the p.c.b.).
8) Mark the connections of the 2 connecting wires (red +, blue -) and disconnect the wires.
9) Swing the electronic p.c.b. away.
10) Remove the brake.

Brake installation

Install the brake in reverse order to removal.
Mount the brake in such a way that the incoming + and - wires can be connected. Make sure the teeth of the segment disk do not touch the HKZs as these would be destroyed!
Check the running of the segments again while the motor is rotating.
If necessary, loosen the 2 fastening screws on the brake and align the electronic p.c.b.

1...nM46 Blower motor / dampening system

Place of installation and task



Place of installation of blower motor / dampening system

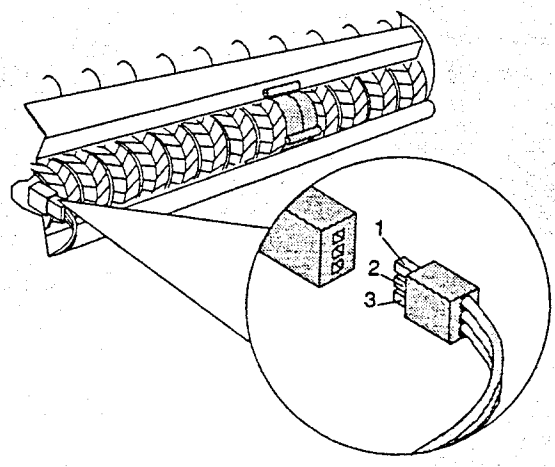
The blower combination with the motor 1...nM46 is located under the guard for the inking and dampening rollers.
The motor is a d.c. motor with brushes.
It is integrated in the middle of the blower bar and drives a cross-flow fan.

Technical data

Motor data

- U = 24V DC

Pin assignment

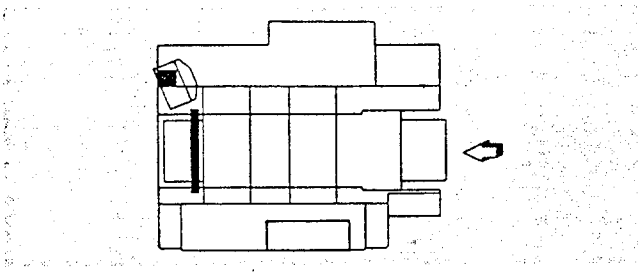


Plug for blower motor / dampening system

Pin	Function
1	Enable message
2	Ground 24V
3	24 V DC

12E2 Powder spray device

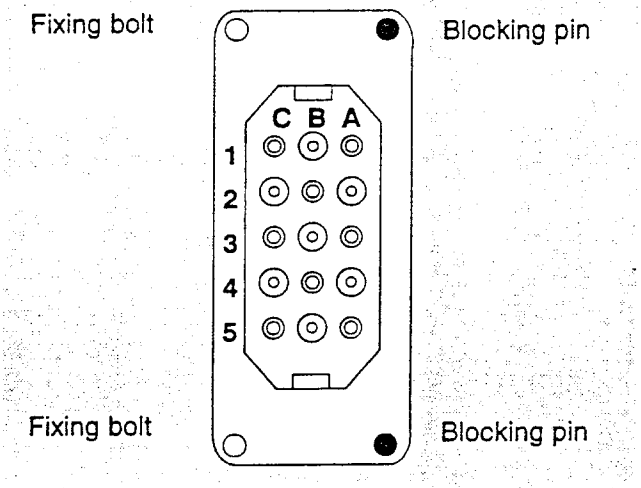
Place of installation



Powder spray device with powder tube at the delivery of the press, top view

The powder spray device and powder tube are both located at the delivery. The powder tube is fitted at right angles to the running direction of the paper, across the width of the press.

Pin assignment



Plug 12E2X2 coming from the press, powder spray device

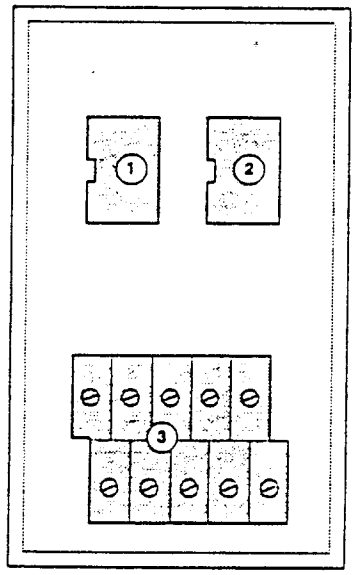
The interfaces of the powder spray device T6 from Weko and those of the Junior Plus from Grafix to CPTRONIC are identical.
The plug connection 12E2X2 is located in the cable section leading from the powder spray device to the distribution box, approx. 0.5 m away from the powder spray device. Plug 12E2X1 is directly at the blower motor.

Pin	Function
A1	24V DC
A2	–
A3	Blower / powder spray device 220V AC
A4	–
A5	Test (24V DC)
B1	Ground 24V
B2	220V AC zero
B3	–
B4	–
B5	Powdering cycle (ground)
C1	Fault message / powder spray device (24V DC)
C2	–
C3	220V AC phase
C4	Ground 24V
C5	24V DC
⏚	PE conductor

Electronic boards/modules

AUM Analog conversion module

Layout and purpose



Layout of AUM

① Plug connector X1
② Plug connector X2
③ Terminal strip X3

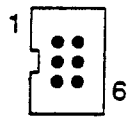
The analog conversion module AUM is a passive module which transmits the signals from terminal strip X3 to the plug connectors X1 and X2.

Connections:

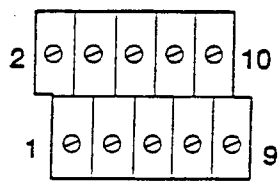
X1	1	2	3	4	5	6
X3	1	3	5	–	7	9

X2	1	2	3	4	5	6
X3	2	4	6	–	8	10

Plug connectors X1, X2:



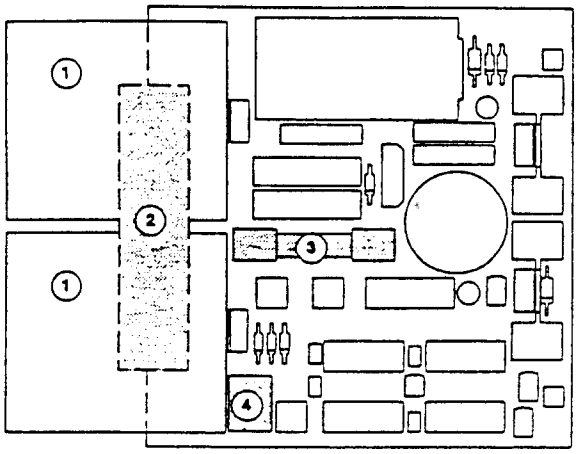
Terminal strip X3:



Plug connectors/terminal strip

BAM Brake control module

Layout



Brake control module BAM

① Heat sink

② X1 Pin base (below heat sink);
plug connection to main motor and EAK

③ Fuse F1, 8A, slow-blowing

④ X2 Socket base; plug connection to safety input board SEK

Function

The brake control module BAM is used for main d.c. drives with holding brake. The BAM converts the signals coming from the control electronics of the main drive and from the safety input board SEK into potential-free trigger signals.

After enabling, the brake is supplied with 48V and thus in a state of overexcitation; after 1 second, it is subjected to clocked control. The relay on the BAM serves as make contact and for rapid shutdown.

On the BAM the clocked trigger voltage is monitored and in the case of a fault a fault message is generated. This fault message is transmitted to the safety input board SEK. Ten seconds after generation of the fault message, an emergency stop occurs and the brake is shut off via the relay.

Aufbau des BKM

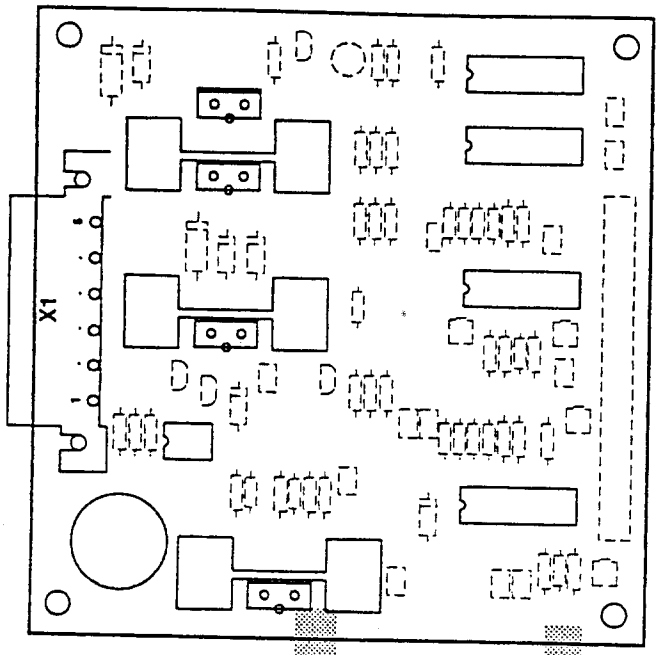


Abb.: Bremse - Kupplungs - Modul BKM

Eingangsspannungen für das BKM sind
1. 24V- von NTK_LA, und
2. 48V- von GRM 48

Für die Logikbausteine auf dem BKM werden intern 12V- erzeugt.

Eingangsspannungen und Singnale können am Stecker X1 gemessen werden.

Steckerbelegung X1
Pin 1: 48V von GRM48
Pin 2: Masse 48V
Pin 3: 24V von NTK_LA
Pin 4: Ausgang 1 von EAK15 über 15FAM64
Pin 5: Ansteuerung der Kupplung
Pin 6: Ansteuerung der Bremse

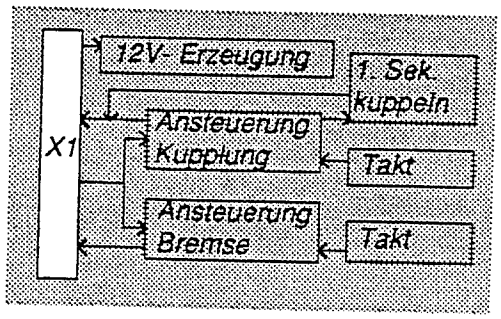
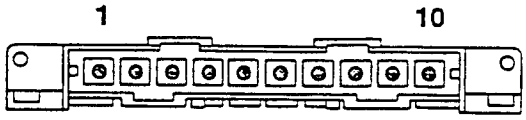


Abb.: Blockschaltbild BKM

Pin assignment

X1

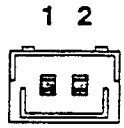


Pin base X1 10-pole

X1 Plug connection to motor

Pin	Function
1	+ 48V DC
2, 3	Brake –
4, 5	Brake +
6	⊥ 48V
7	1st control signal (+12–24V DC)
8	1st control signal (⊥ 12–24V)
9	2nd control signal (+12–24V DC)
10	2nd control signal (⊥ 12–24V)

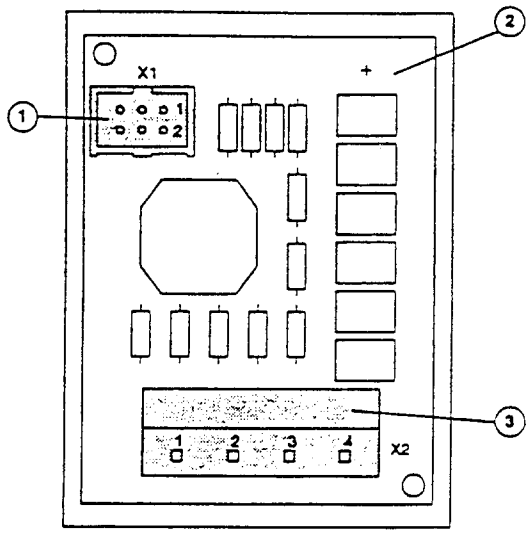
X2



Socket base X2 2-pole

ESM Interference suppressor module

Layout



Interference suppressor module ESM

① Pin base X1; plug connection to RER (RER-XU1)

② Interference suppressor module ESM

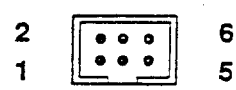
③ Terminal strip X2; connections to main motor (M1-X2)

Function

The interference suppressor module ESM is a filter which compensates for interference resulting from the code acquisition of the main motor.

Pin assignment

X1



Pin base X1 6-pole

X1 Plug connection to RER (XU1)

Pin	Function
1	+ 10V
2	⊥ 10V

X2 Terminal connection to main motor (M1-X2)

Pin	Function
4	+ 10V
3	⊥ 10V

Ground Connections 5V, 24V, 48V, 120V
Mother Boards Swing Frame

PURPOSE:

- Controlling earth leakage occuring on rectifier modules, flat cables, cables to push buttons, limit switches and motors of the printing press with a DC circuit voltage = 120V.

- Raise in efficiency of the press

FUNCTION:

- The IWM controls the insulation resistor of the circuit by measuring it permanently.

- During operation the green diode is on.

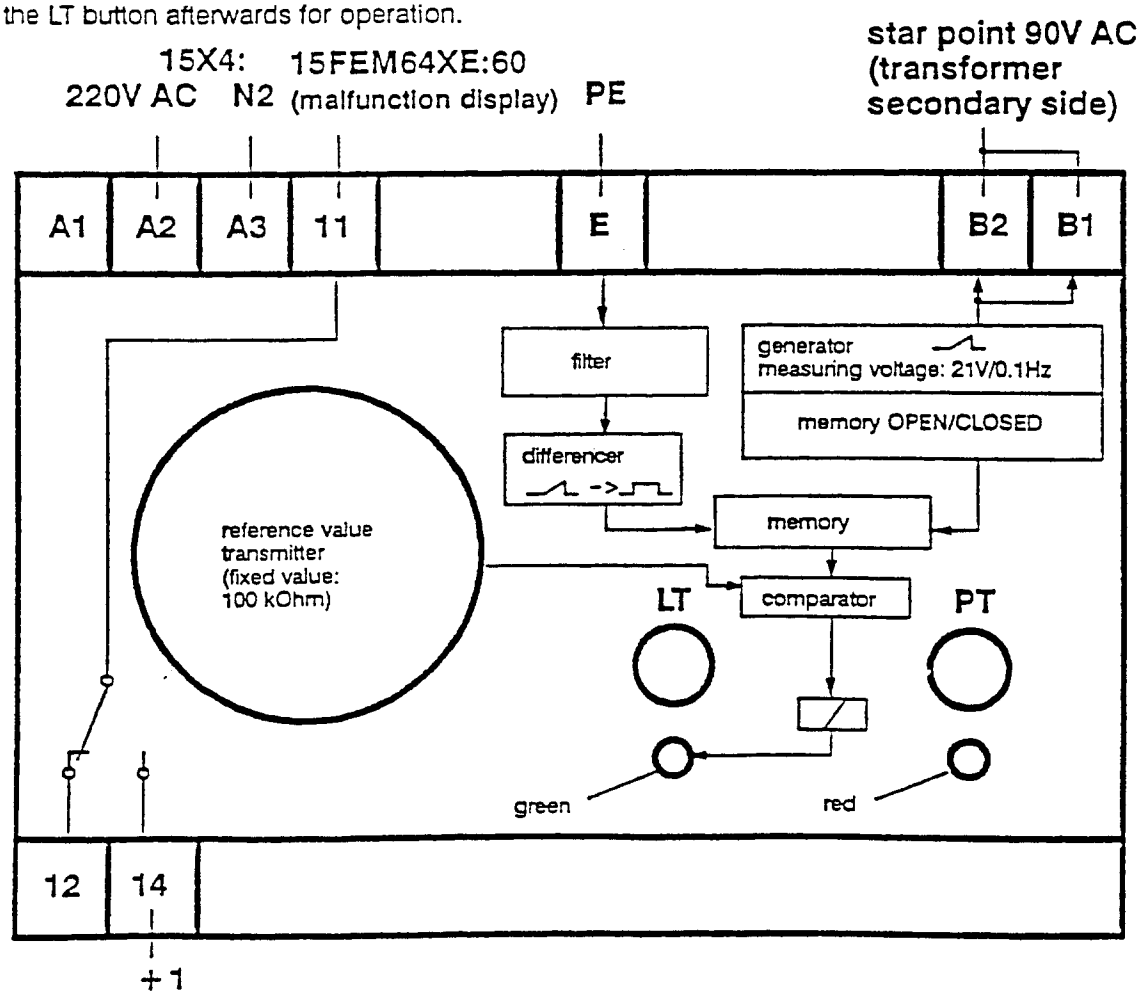
- If there occurs an earth leakage, it will be indicated by a red diode after about 20 seconds. => the operation of the press will not be affected. The yellow malfunction light at the control console indicates.(F60 => paper run not possible)

- When the malfunction is taken care of, the button LT has to be pressed at the IWM. The red diode goes out.

FUNCTION TEST:

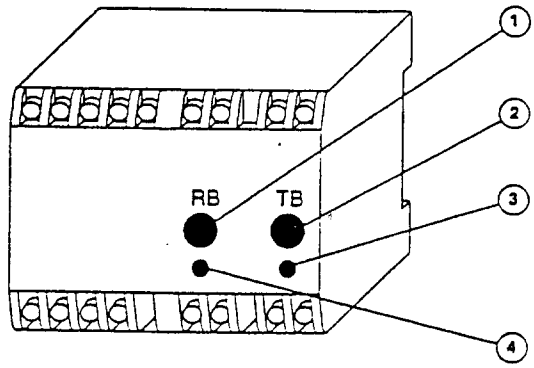
- The module can be checked by disconnecting B1 and B2 and pushing the checkbutton PT about 20 seconds. => the green diode goes out, the red diode goes on.

- Push the LT button afterwards for operation.



IWM Earth-leakage monitor module

Layout



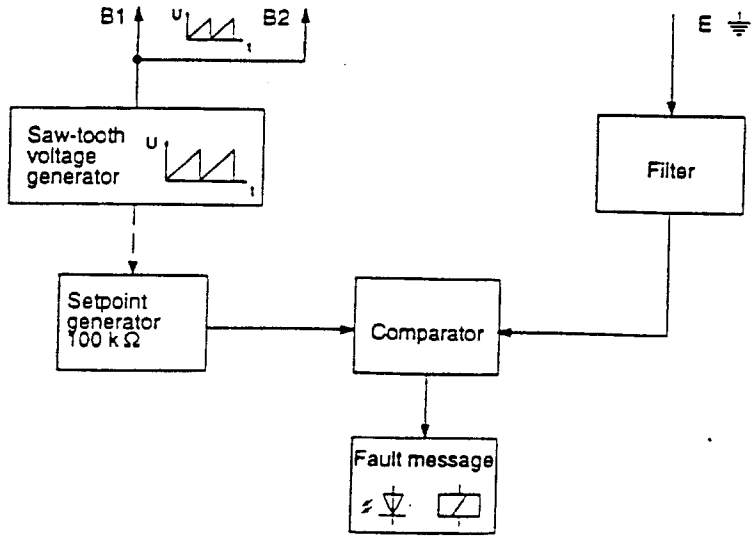
Top view: earth-leakage monitor module IWM

① Delete button RB (reset button)
② Test button TB
③ LED red, insulation fault
④ LED green, IWM active

Purpose

The earth-leakage monitor module IWM constantly monitors the insulation resistance of the network. If a ground fault is detected, it will be signalled to CPTronic. The press remains ready for operation, but the fault *must* be eliminated.
In addition to the permanent measurement of the insulation resistance, functional testing of the IWM has been integrated.

Block diagram

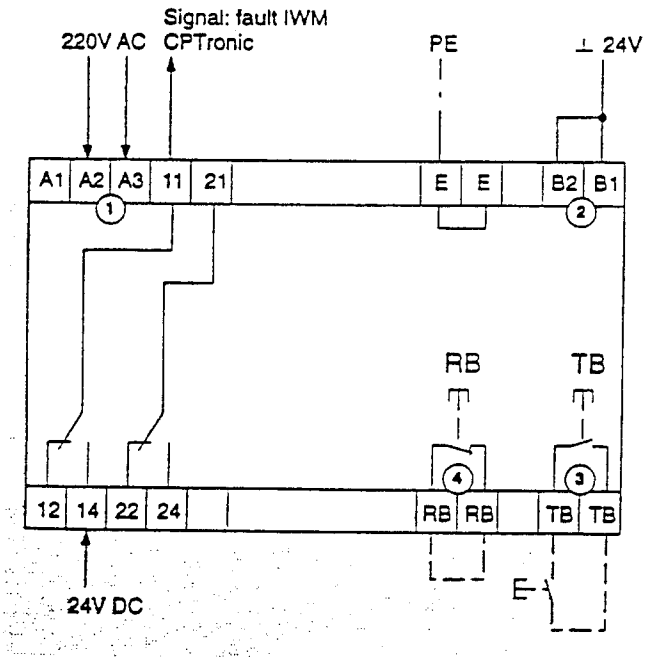


Simplified block diagram of IWM

Function

The saw-tooth voltage generator produces a measuring voltage of 21V with a pulse frequency of 0.1Hz. This voltage is superimposed on the network to be monitored via the connections B1, B2 and returned via the PE conductor connection E (earth) ⏚ .
The input filter suppresses the mains frequency and only lets the measuring pulse pass.
The comparator compares the signals.
If the actual value is below the setpoint value, a fault message is output. The red LED is lit and a fault signal is transmitted via a relay (closed-circuit principle). CPTronic detects an insulation fault.

Connection



Top view: earth-leakage monitor module IWM

① Terminals A2, A3: input voltage

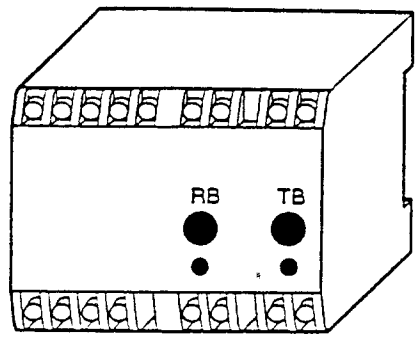
② Terminals B1, B2: ground / monitoring of network

③ Terminals TB-TB: possibility to connect an external test button

④ Terminals RB-RB: possibility to connect an external delete button

The green pilot lamp (LED) is lit if the input voltage is correct. An additional delete button can be connected to the terminals RB-RB. These terminals are jumpered.
After elimination of the fault the fault message is *not* deleted automatically.

Checks



Top view: earth-leakage monitor module IWM

Functional test

The working condition is indicated by the green LED.

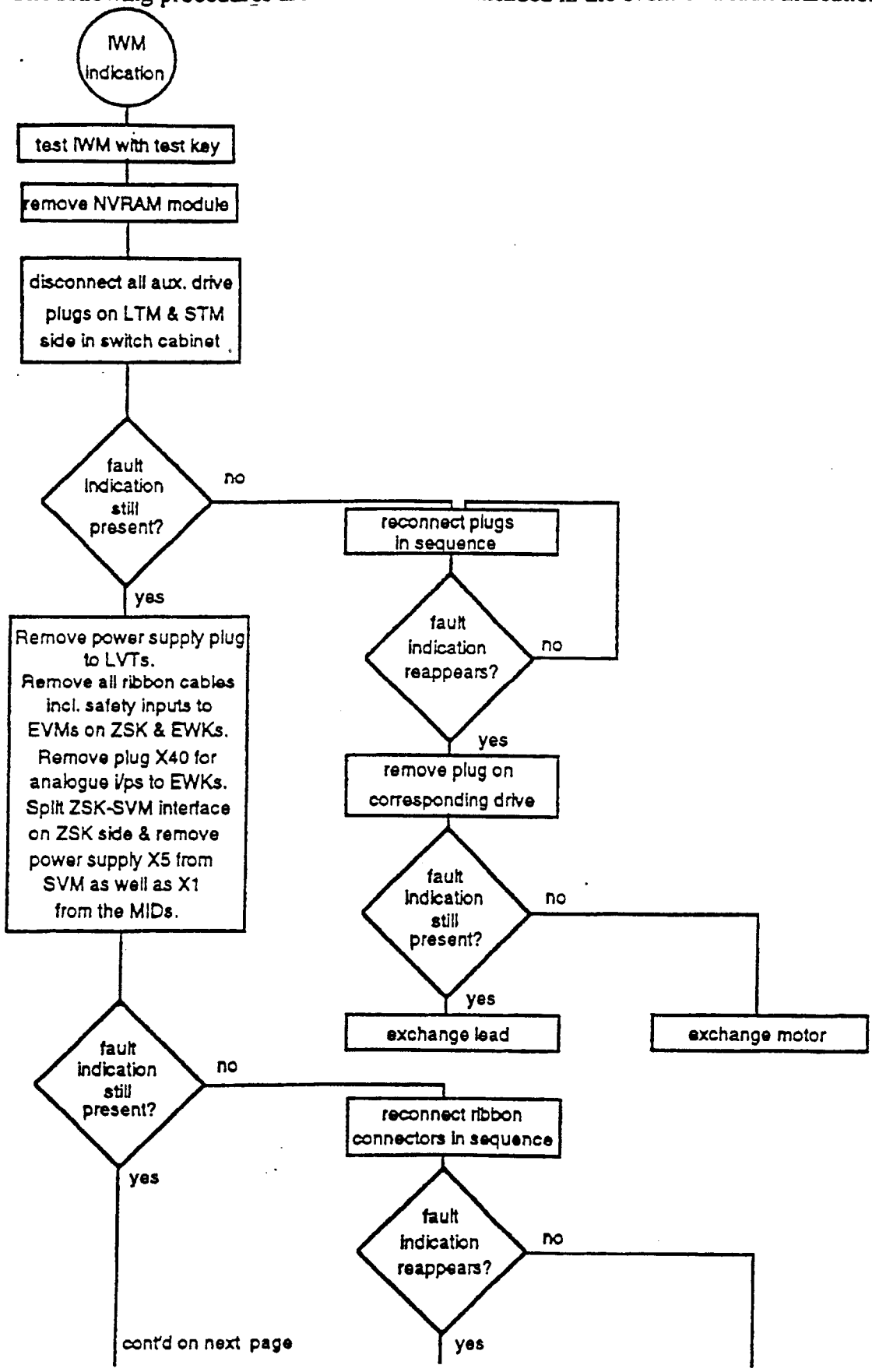
1. Green LED is lit:
   power is present, the earth-leakage monitor module IWM is active.
2. Press the test button TB for approx. 20s:
   an insulation fault is simulated.
3. The red LED is lit:
   an insulation fault has occurred.
4. Press the delete button RB for approx. 20s:
   the stored fault is deleted.
5. The red LED goes off:
   the earth-leakage monitor module IWM is active.

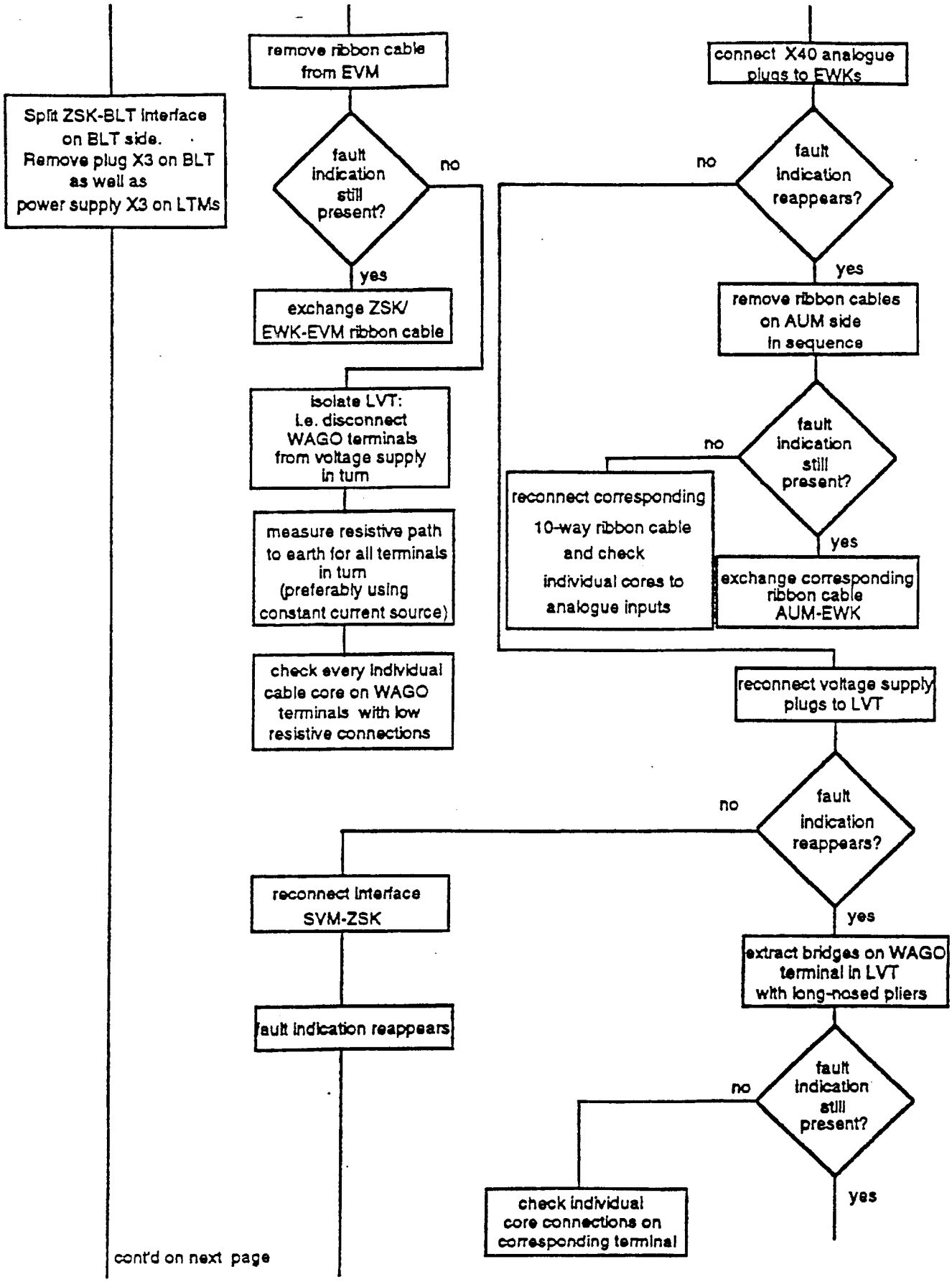
Removal/installation

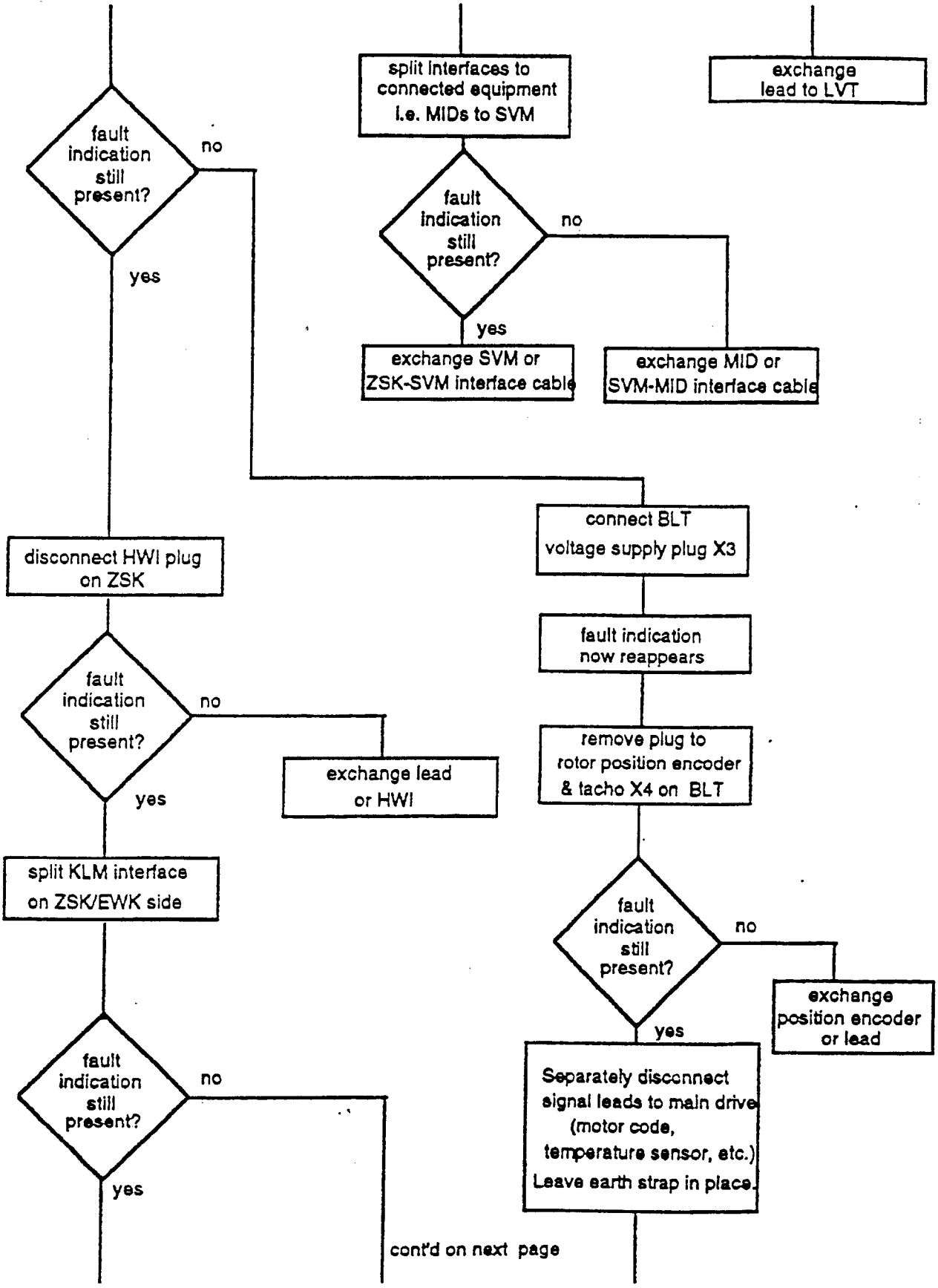
If the earth-leakage monitor module IWM is replaced, a functional test must be carried out.

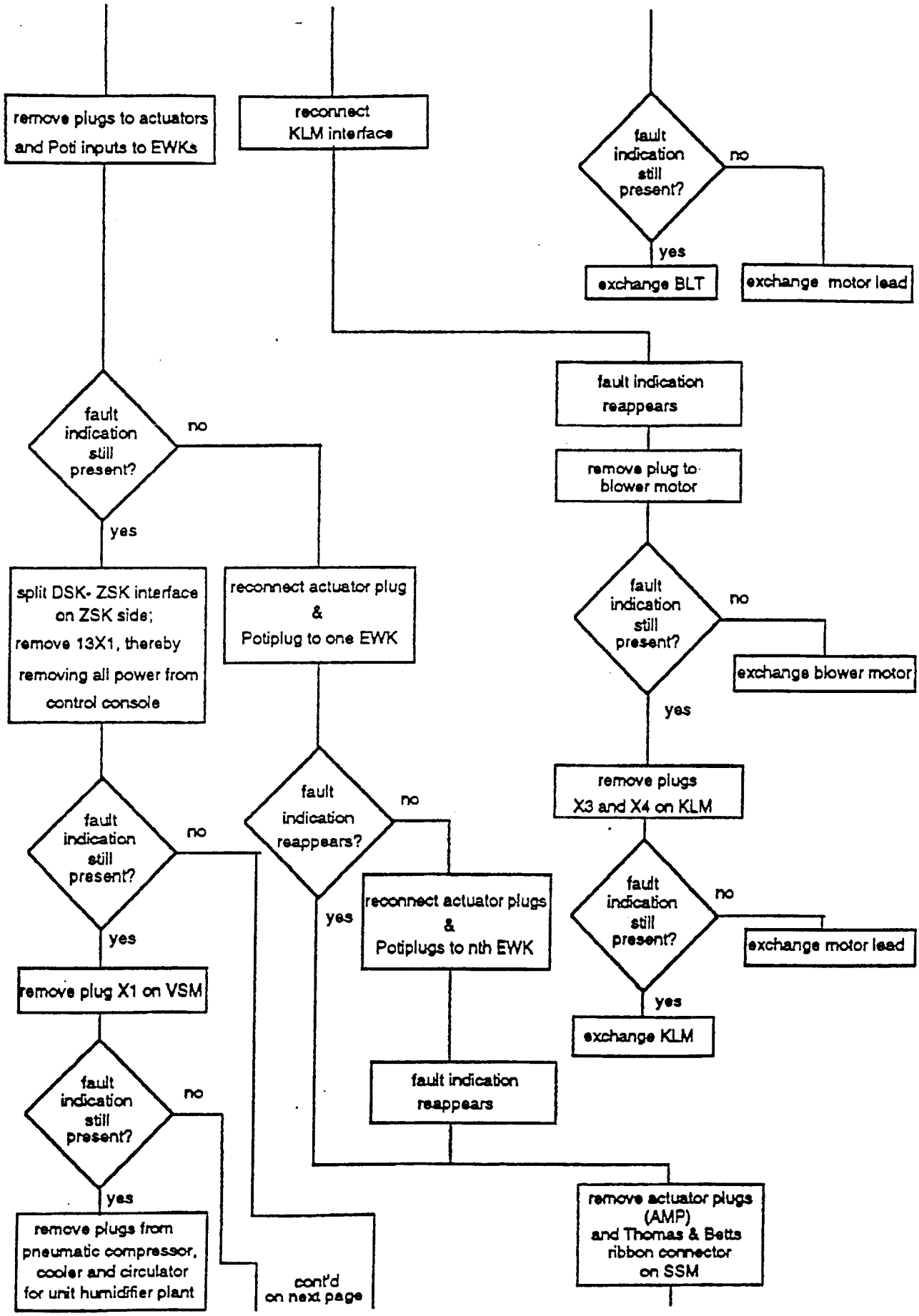
EARTH LEAKAGE COMPACT

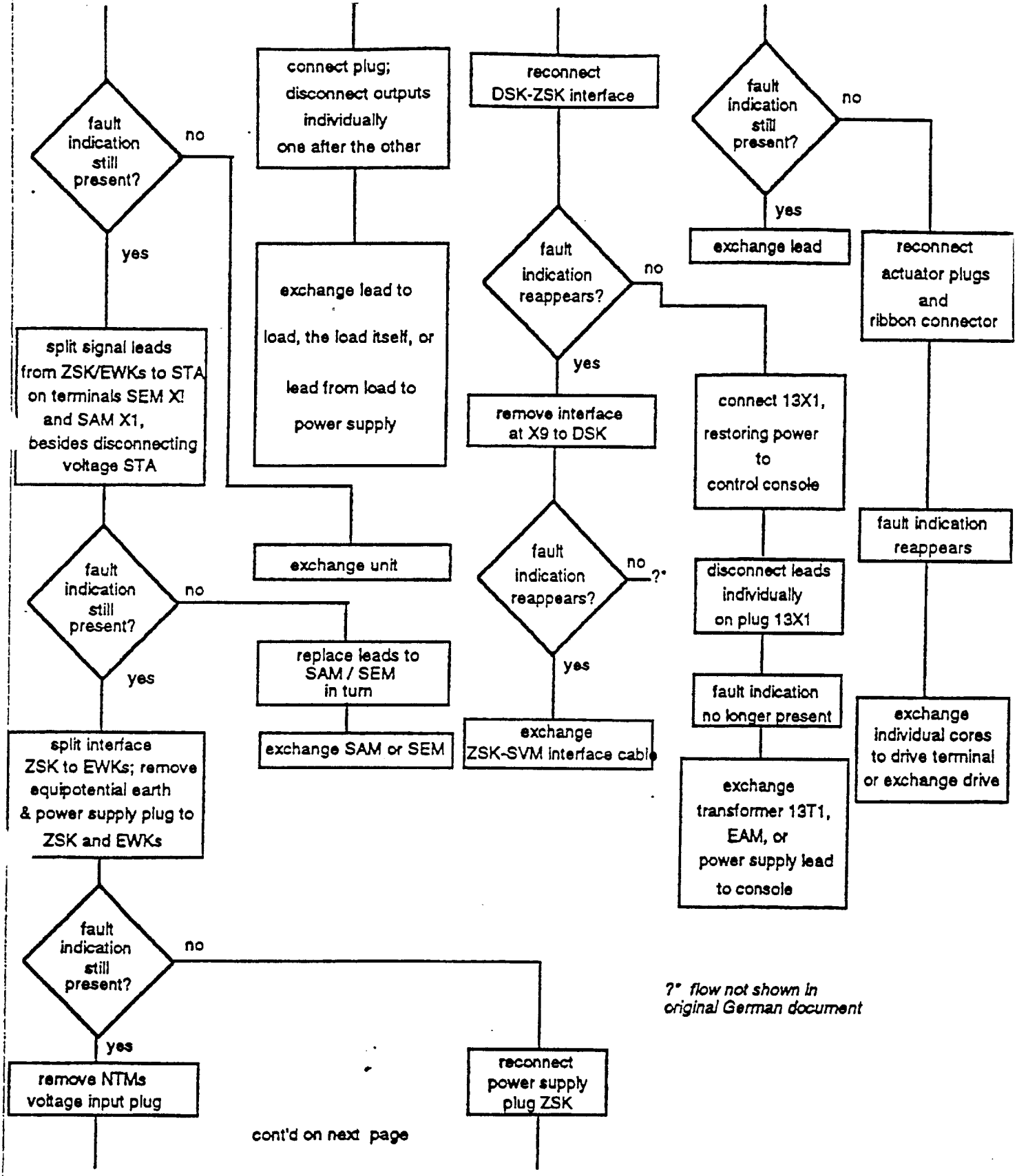
The following procedures are therefore recommended in the event of a fault indication:




Split ZSK-BLT interface on BLT side. Remove plug X3 on BLT as well as power supply X3 on LTMs
remove ribbon cable from EVM
fault indication still present?
no
yes
exchange ZSK/ EWK-EVM ribbon cable
isolate LVT: i.e. disconnect WAGO terminals from voltage supply in turn
measure resistive path to earth for all terminals in turn (preferably using constant current source)
check every individual cable core on WAGO terminals with low resistive connections
reconnect interface SVM-ZSK
fault indication reappears
cont'd on next page
connect X40 analogue plugs to EWKs
fault indication reappears?
no
yes
remove ribbon cables on AUM side in sequence
fault indication still present?
no
yes
reconnect corresponding 10-way ribbon cable and check individual cores to analogue inputs
exchange corresponding ribbon cable AUM-EWK
reconnect voltage supply plugs to LVT
fault indication reappears?
no
yes
extract bridges on WAGO terminal in LVT with long-nosed pliers
fault indication still present?
no
yes
check individual core connections on corresponding terminal


split interfaces to connected equipment i.e. MIDs to SVM
exchange lead to LVT
fault indication still present?
no
yes
fault indication still present?
no
yes
exchange SVM or ZSK-SVM interface cable
exchange MID or SVM-MID interface cable
connect BLT voltage supply plug X3
disconnect HWI plug on ZSK
fault indication now reappears
fault indication still present?
no
yes
exchange lead or HWI
remove plug to rotor position encoder & tacho X4 on BLT
split KLM interface on ZSK/EWK side
fault indication still present?
no
yes
exchange position encoder or lead
Separately disconnect signal leads to main drive (motor code, temperature sensor, etc.) Leave earth strap in place.
fault indication still present?
no
yes
cont'd on next page


remove plugs to actuators and Poti inputs to EWKs
reconnect KLM interface
fault indication still present?
no
yes
exchange BLT
exchange motor lead
fault indication still present?
no
yes
split DSK- ZSK interface on ZSK side; remove 13X1, thereby removing all power from control console
reconnect actuator plug & Potiplug to one EWK
fault indication reappears
remove plug to blower motor
fault indication still present?
no
exchange blower motor
yes
fault indication still present?
no
yes
remove plug X1 on VSM
fault indication reappears?
no
yes
reconnect actuator plugs & Potiplugs to nth EWK
remove plugs X3 and X4 on KLM
fault indication still present?
no
exchange motor lead
yes
exchange KLM
fault indication still present?
no
yes
remove plugs from pneumatic compressor, cooler and circulator for unit humidifier plant
cont'd on next page
fault indication reappears
remove actuator plugs (AMP) and Thomas & Betts ribbon connector on SSM



? flow not shown in original German document*

Input signals (SEM)

UV dryer with shutter

The electronic control system recognizes that all installed UV dryers are equipped with a shutter.

Dryer blocking after washing

After completion of an automatic washup procedure the signal "Dryer on / off" (SAM) is blocked for approx. 180 seconds.
During this time the position code 20 is displayed in the fault display of the MID and ZID (production run display).

Note:
After automatic washup the UV dryer must stay out of operation for 180 seconds.

Malfunction of sheeter

A malfunction has occurred in the sheeter. In the MID and ZID (production run display) the position code 14 appears in the fault display.

Sheeter in operation

The signal causes the feeder pile control to switch off. The pile at the feeder does not move anymore. Paper is fed in by the sheeter.

Malfunction of dryer

A malfunction has occurred in the dryer. The printing press is brought to a "controlled" standstill, i.e. the current state of the press is taken into account ("Run", "Paper run" and "Production run").
In the MID and ZID (production run display) the position code 20 appears in the fault display.

UV dryer in operation

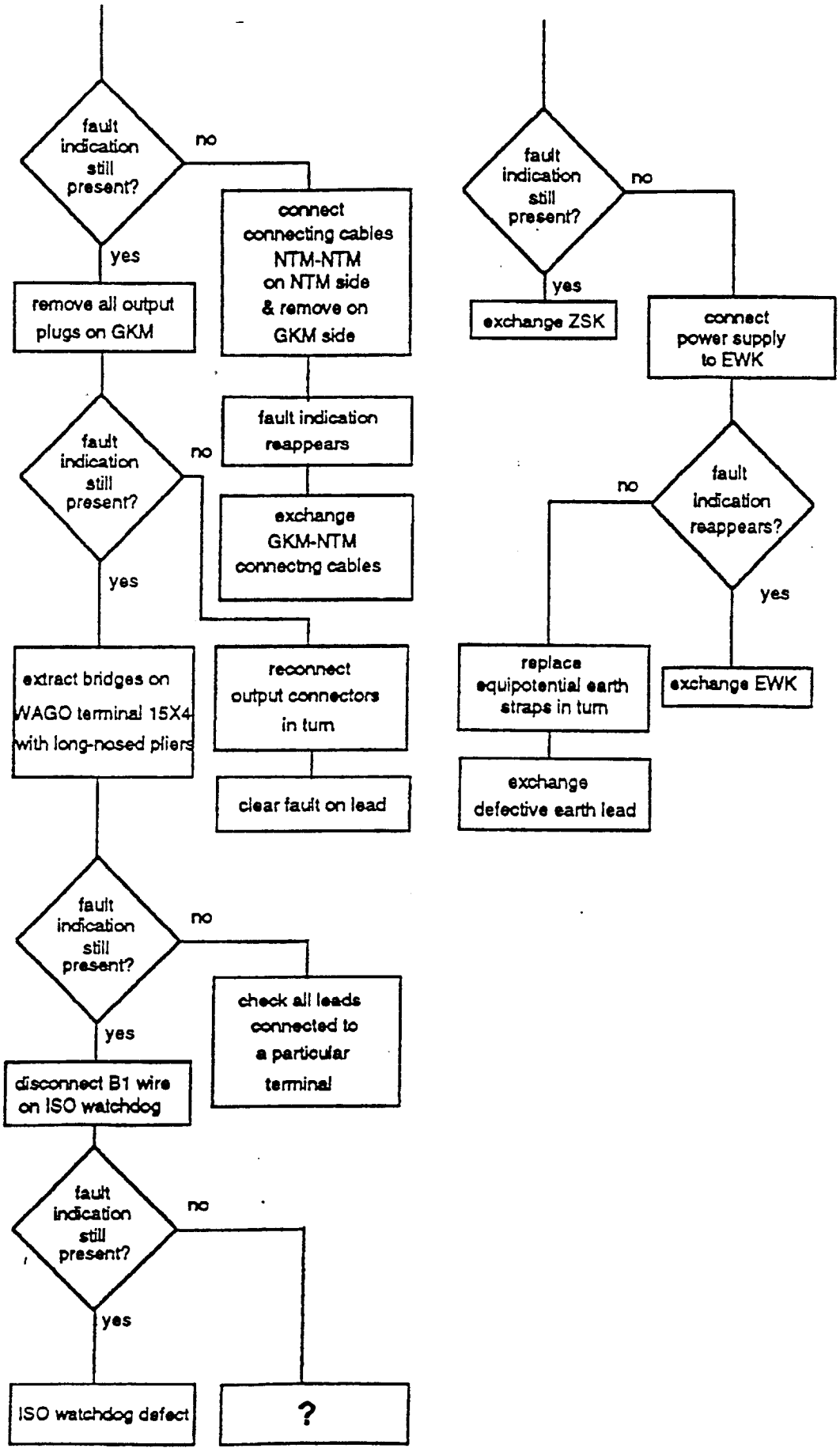
Monitoring of gripper bars in the case of UV dryer without shutter.
The "in-operation" message of the UV dryer is required to monitor the gripper bars in the delivery. If, at press standstill, the gripper bars are in the area of the UV lamps, optical and acoustic warning signals are output.
In the control console display the symbol "Gripper bars in radiator area" appears in the production run display and under the type of fault "Entire press/ warning". At the same time, a warning signal sounds at one-second intervals.
If the gripper bars stay in this area for more than 1 minute, the electronic control system switches off the signal "Dryer on/off" (SAM).

Locking the washup device:
The signal "UV dryer in operation" is also required to lock the washup devices in the printing units.
When the signal "UV dryer in operation" is present, automatic washup is not possible. When the signal "UV dryer in operation" is no longer present, a waiting time of 180s starts.
In the ZID the message "Dryer waiting time" indicating the current waiting time appears in the command mode "WASHUP".

Note:
Before automatic washup starts, the UV dryer must have been out of operation for at least 180 seconds.

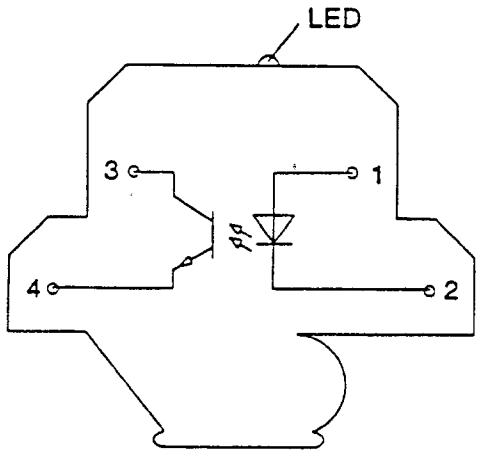
Emergency stop

The emergency stop signal brings the printing press to a standstill as quickly as possible.
In the MID and ZID (production run display) the position code 15 appears in the fault display. In the ZID the symbol "Emergency stop" appears under the type of fault "Entire press/press not ready to run".


fault indication still present?
no
yes
connect connecting cables NTM-NTM on NTM side & remove on GKM side
remove all output plugs on GKM
fault indication still present?
no
fault indication reappears
exchange GKM-NTM connectng cables
yes
extract bridges on WAGO terminal 15X4 with long-nosed pliers
reconnect output connectors in turn
clear fault on lead
fault indication still present?
no
check all leads connected to a particular terminal
yes
disconnect B1 wire on ISO watchdog
fault indication still present?
no
yes
ISO watchdog defect
?
fault indication still present?
no
yes
exchange ZSK
connect power supply to EWK
fault indication reappears?
no
yes
exchange EWK
replace equipotential earth straps in turn
exchange defective earth lead

15U5 Optocoupler module

Function



Optocoupler module 15U5

The optocoupler module 15U5 acquires the 220V signal from brush monitoring (main drive with shunt motor with brushes). With the help of the optocoupler, the 220V signal becomes an isolated 24V signal, which is then passed to the input/ output board EAK via the flat cable input module FEM.

Terminal assignment

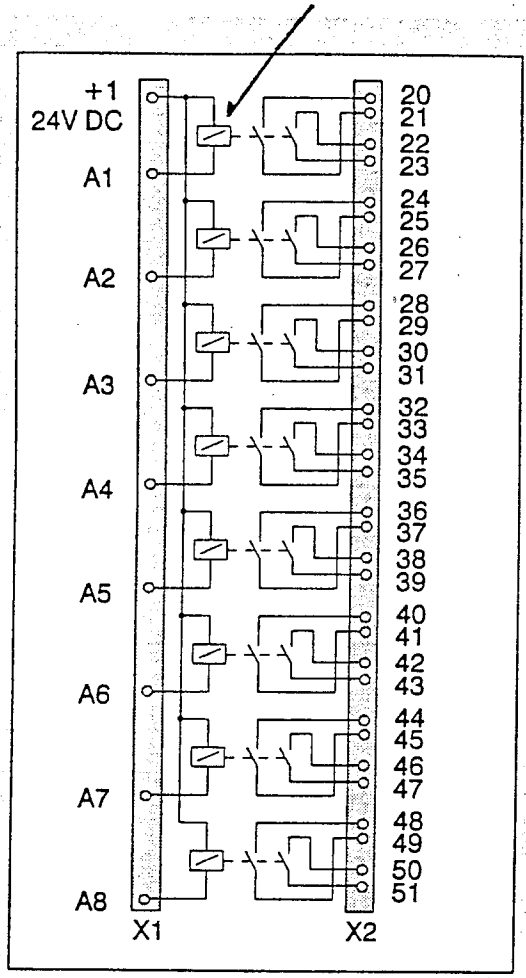
15U5 Terminal assignment of optocoupler module

Terminal	Function
1	220 V AC
3	+24V DC

SAM Interface output module

Structure and task

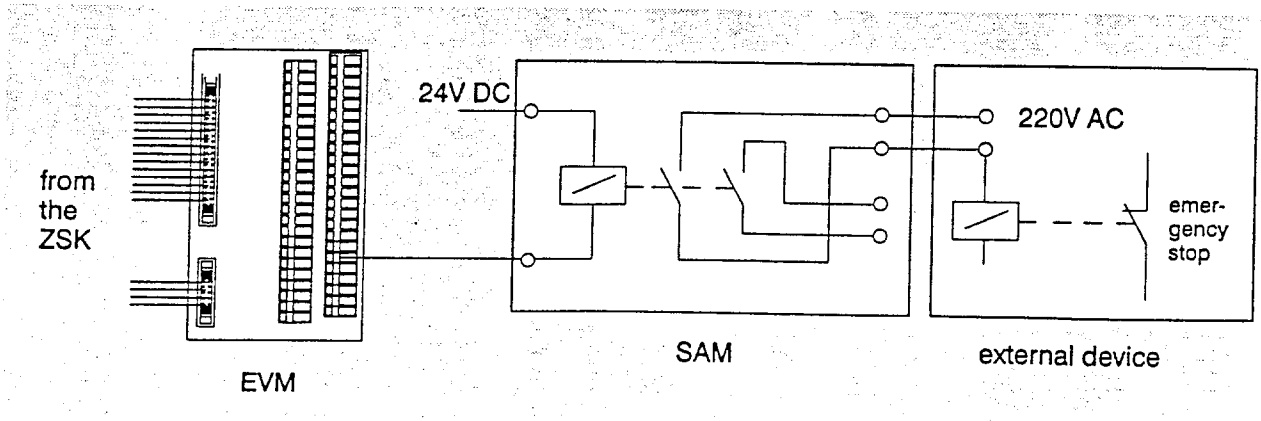
Elesta SGR 282 } 00.781.1594



Structure of SAM

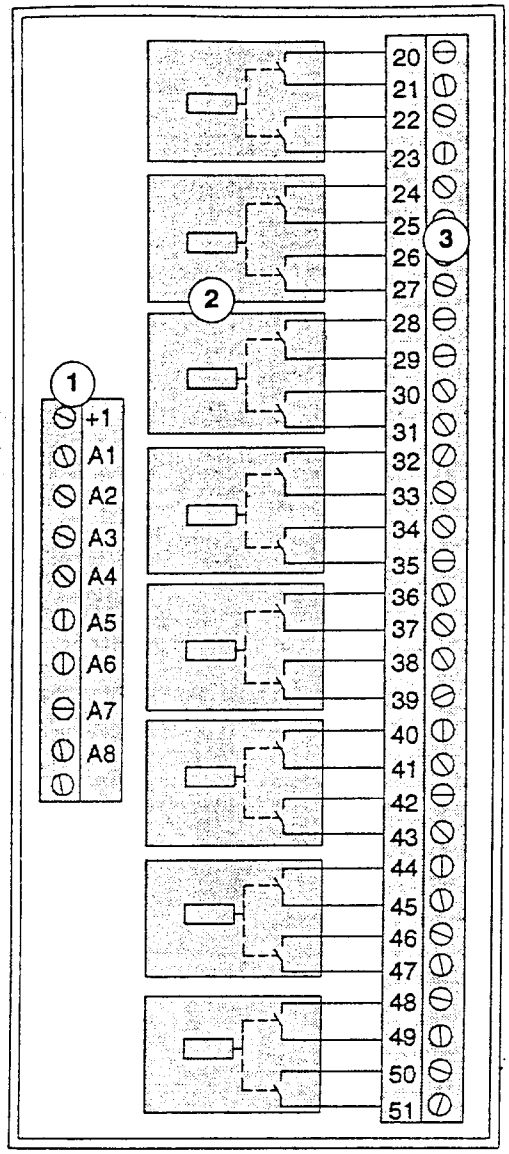
The function of the SAM is to isolate the outputs of the CPTRONIC control system from the optional equipment. Through a ZSK output to ground a relay is switched via an input/output connection module EVM.
Thus switching operations are carried out in external devices. Each time two switches are actuated in parallel.
With the NO contacts of the relays 220V AC can be transmitted directly.

Block diagram



Principle of SAM

Connections



Interface output module SAM

① Terminal strip: SAM-X1; connections to central control cabinet ZSG

② Relays

③ Terminal strip: SAM-X2; connections of the optional equipment

The cables from the optional equipment are connected to terminal strip SAM-X2 of the interface output module SAM.

	Connection to terminals	Optional equipment: max. contact load: 220VAC/1A
A1	20 and 21 22 and 23	Run
A2	24 and 25 26 and 27	Dryer on/off (emergency stop) (e.g.: IR dryer or UV dryer)
A3	28 and 29 30 and 31	Radiators on/off (e.g.: IR dryer or UV dryer)
A4	32 and 33 34 and 35	Paper in printing unit 1 during production run (e.g.: UV dryer)
A5	36 and 37 38 and 39	Emergency stop (e.g.: sheeter)
A6	40 and 41 42 and 43	Printed sheets in delivery (e.g.: tape inserter)
A7	44 and 45 46 and 47	Feeder on/off (e.g.: HSQ)
A8	48 and 49 50 and 51	Powder spray device on/off

Important

To ensure trouble-free functioning of the press control system, make sure that the optional equipment to be connected is provided with suitable *interference suppressors.*

For safety reasons the signals *"Radiators ON/OFF"* and *"Paper in PU1 during production run"* must be appropriately combined with the signal *"Run"* by the dryer manufacturer.

For safety reasons the washup devices and UV dryers on printing presses must not be operated simultaneously.

After a manual washup procedure it is likewise necessary to wait an adequate period of time until all vapours have escaped!

Output signals (SAM)

Caution:

The signals "Radiators on/off" and "Paper in printing unit 1 during production run" must be appropriately linked with the "Run" signal if a UV dryer is connected.

For safety reasons washup devices and dryers must **not be operated at the same time**. Before and after washup, UV dryers must stay out of operation for **180 seconds**.

Run

Control signal for all optional equipment.
The signal is present when the press is on "Run" (press runs at minimum speed, i.e. 3000 i.p.h.).

Dryer on/off

Control signal e.g. for IR and UV dryers.
The signal is switched on if

- the dryer has been preselected at the control console
  and
  the following guards are closed:
  cylinder guards between the printing units and guard of printing unit/delivery;
- there is still paper in the press after a press standstill and the press goes on "Run" again.

The signal is switched off if

- an emergency stop function has been triggered;

  Note:
  Only in the case of press standstill caused by an "Emergency stop" button, cylinder guard between the printing units and guard of printing unit/delivery.
- automatic washup is initiated;
- there is still paper in the press during press standstill (does not apply to UV dryer with shutter);
- the gripper bars in the delivery stay in the radiator area of the UV dryer for more than 1 minute (only applies to UV dryer without shutter).

Radiators on/off

Control signal e.g. for IR and UV dryers.
The signal is present when printed sheets pass the dryer section in the delivery.
If there is an emergency stop during production run, the signal switches off. When the press is on "Run" again, the signal is present again until all sheets have reached the delivery.
With the function "Dryer on/off" in the actual value display the signal can be switched off and on.

Paper in printing unit1 during production run

Control signal e.g. for inter-unit dryers.
The signal is present when the sheets pass through the 1st printing unit during "Production run".

Emergency stop (of printing press)

Control signal for the optional equipment which is to shut off when an "Emergency stop" button on the press is actuated.
The signal is present as long as no "Emergency stop" button is actuated.

Printed sheets in the delivery

Control signal e.g. for the tape inserter.

Prerequisite:
The job counter is switched on.
Control is effected when printed sheets reach the delivery.

Feeder on/off

Control signal e.g. for the sheeter.
The control signal is present as long as the feeder is engaged.

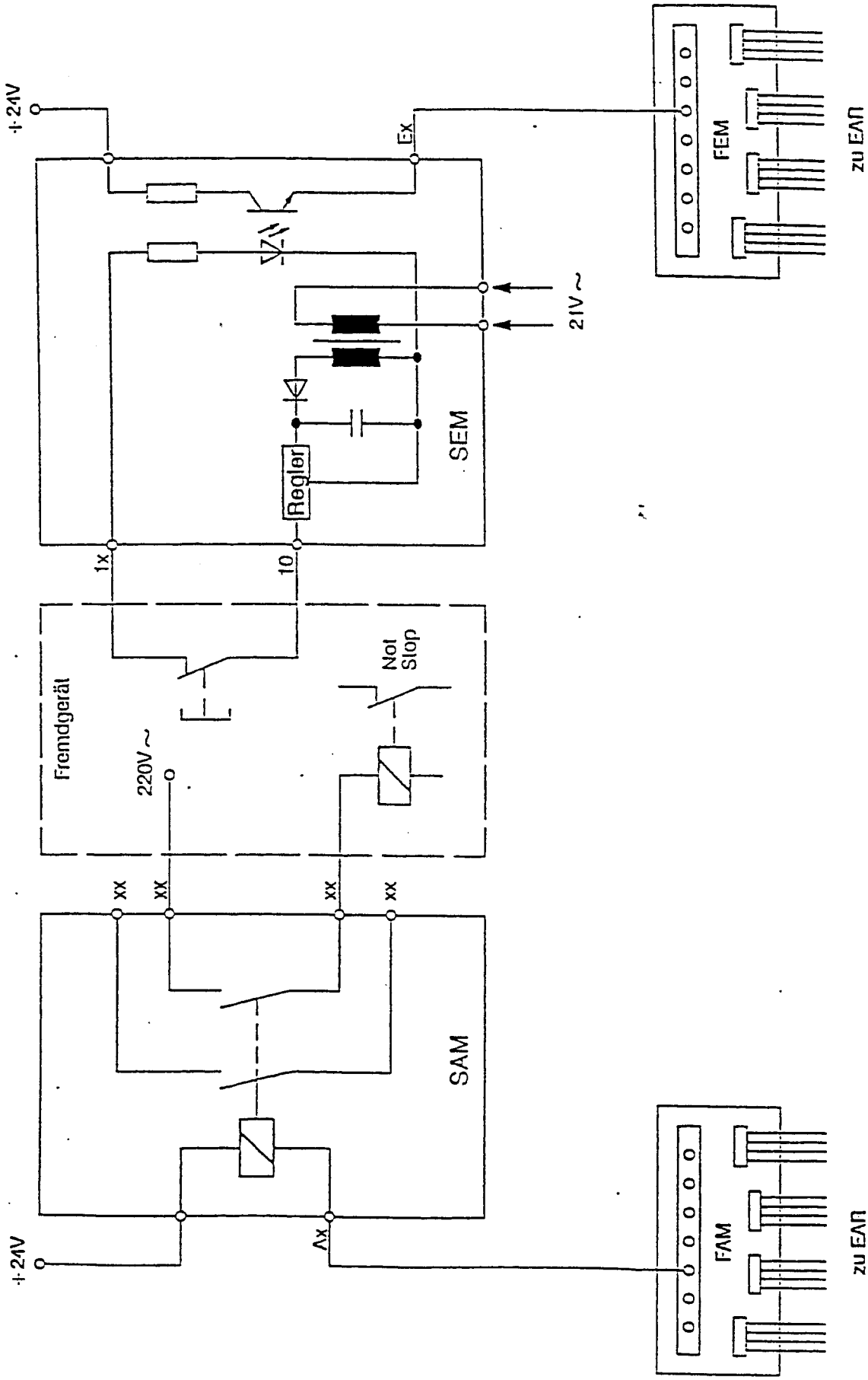
Powder spray device on

Control signal for external powder spray devices.

Prerequisite:
The powder spray device has been preselected at the control console.

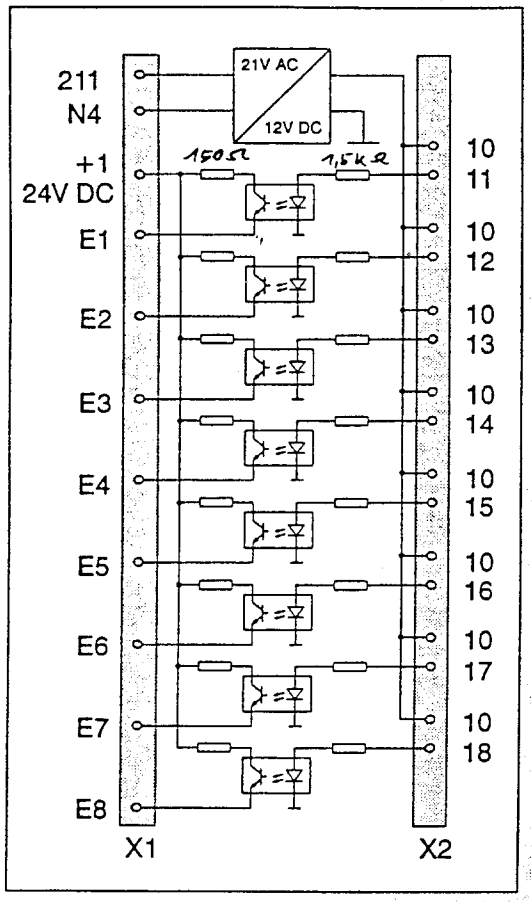
The signal is present as long as printed sheets leave the last printing unit and reach the delivery.

SAM und SEM Schaltbild



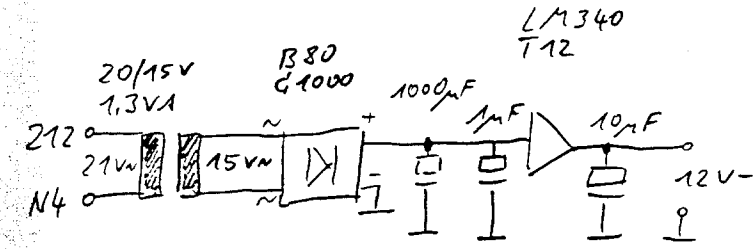
SEM Interface input module

Structure and task

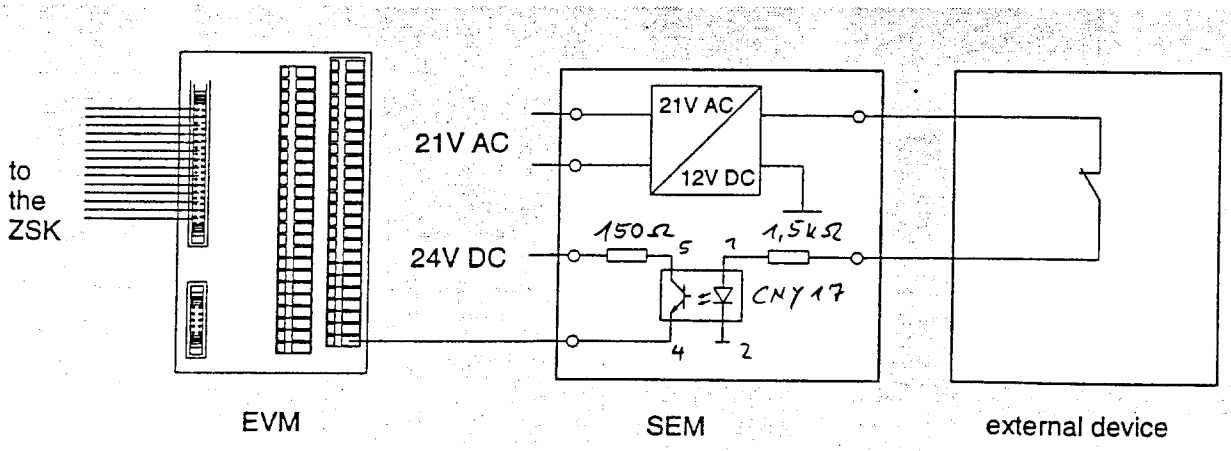


Structure of SEM

The function of the SEM is to isolate the inputs to the CPTRONIC control system from the optional equipment. For this purpose, an auxiliary voltage of 12V DC is generated from 21V AC on the SEM. This voltage is picked up by the external device and switched back.
On the SEM this voltage is then passed on to an optocoupler which transmits 24V DC to the EVM and from there to the ZSK.

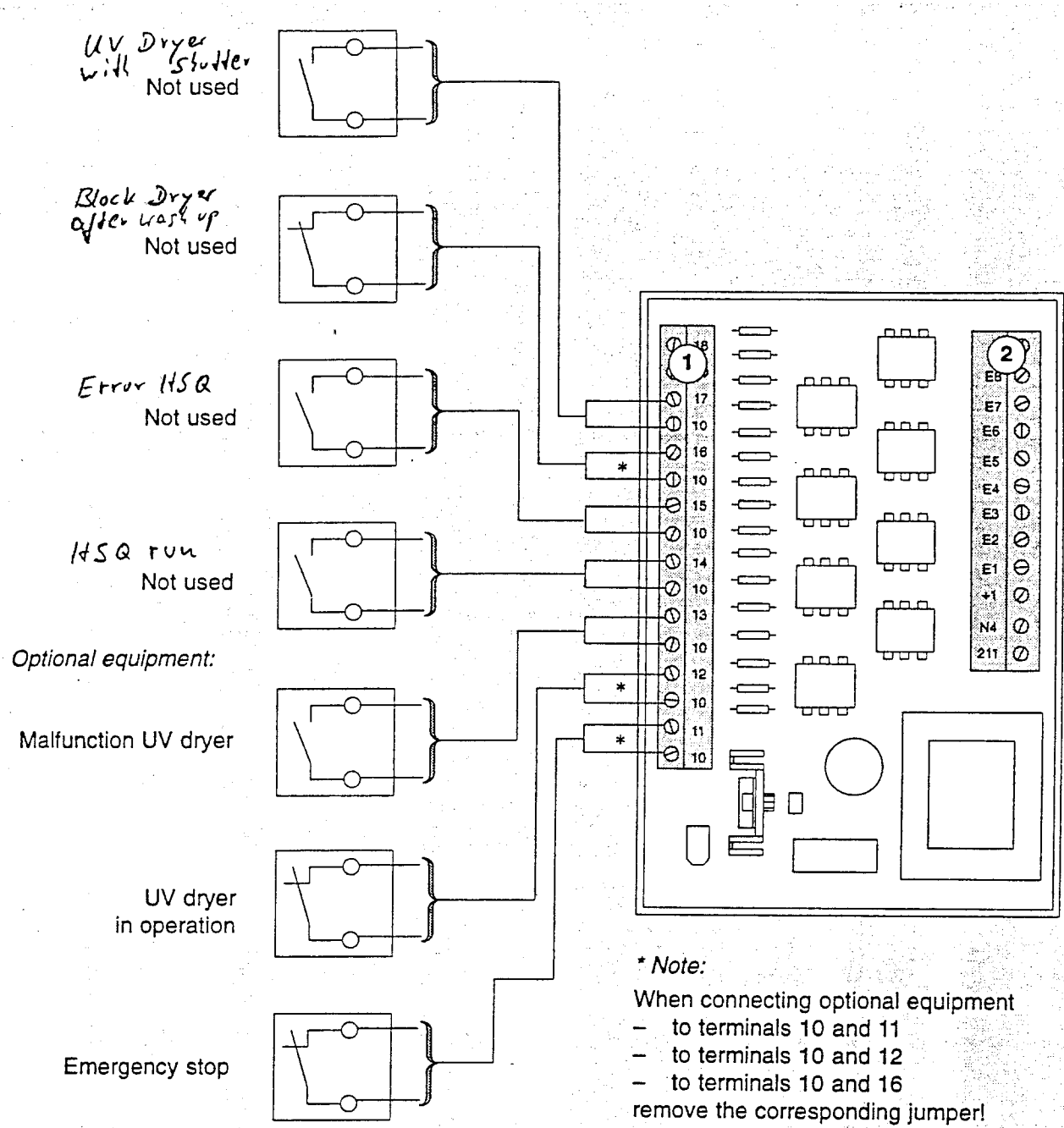


Block diagram



Principle of SEM

Connections



** Note:*
When connecting optional equipment
- to terminals 10 and 11
- to terminals 10 and 12
- to terminals 10 and 16

remove the corresponding jumper!

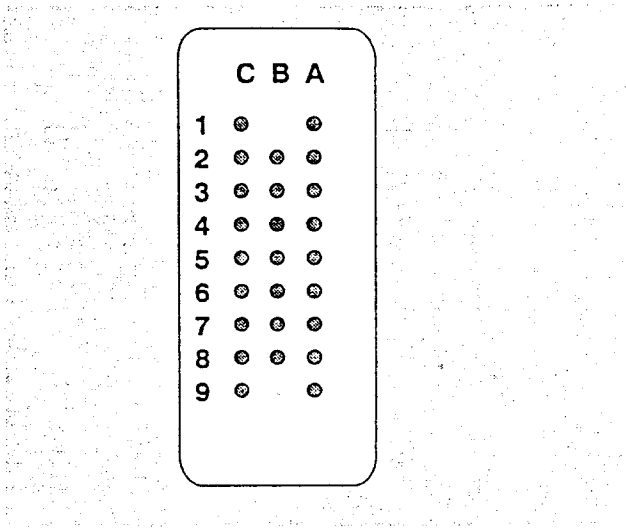
Optional equipment connected to SEM

The cables from the optional equipment are connected to terminal strip SEM-X2 of the interface input module SEM.

① Terminal strip: SEM-X2; connections of the optional equipment

② Terminal strip: SEM-X1; connections to the central control cabinet ZSG

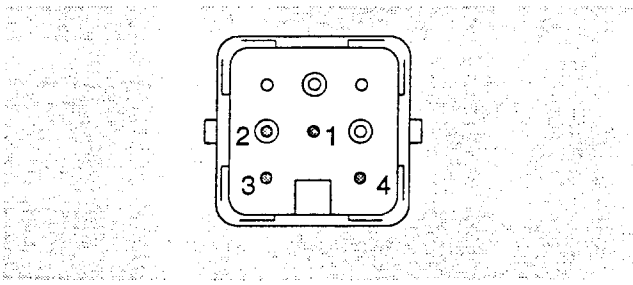
Plug connection STA-X3



Plug STA-X3 coming from the press

Pin	Function
A1	220V AC
A2	Zero 220V AC
A3	24V DC
A4	Run
A5	Dryer on / off
A6	Radiators on / off
A7	Paper in PU1
A8	Emergency stop
A9	Printed sheets in delivery
B2	Feeder on
B3	Powder spray device on / off
B4	Emergency stop
B5	UV dryer in operation
B6	Malfunction UV dryer
B7	–
B8	–
C1	–
C2	–
C3	–
C4	21V AC
C5	Zero 21V AC
C6	–
C7	–
C8	–
C9	–
⏚	PE conductor

Plug connection STA-X2

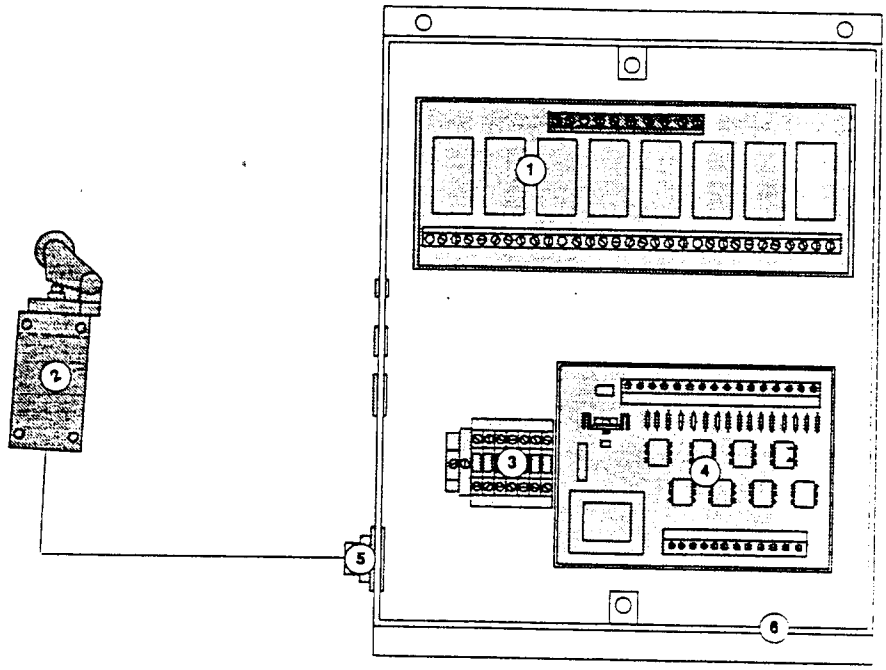


Plug STA-X2 coming from position switch "Press cycle" 1S65

Pin	Function
1 2	NO contact, switching capacity 220V AC, 1A
3 4	NC contact, switching capacity 220V AC, 1A

STA Interface adapter

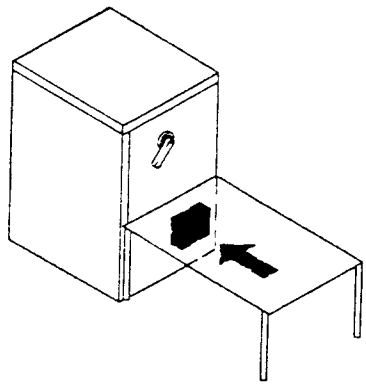
Design



Interface adapter STA

① Interface output module SAM
② Position switch "Press cycle" 1S65
③ Terminal strip STA-X1
④ Interface input module SEM
⑤ Plug connector STA-X2 for position switch "Press cycle" (1S65)
⑥ Housing of interface adapter

Place of installation



Printing press, operator side

The STA is located at the outside of the central control cabinet, underneath the footstep.

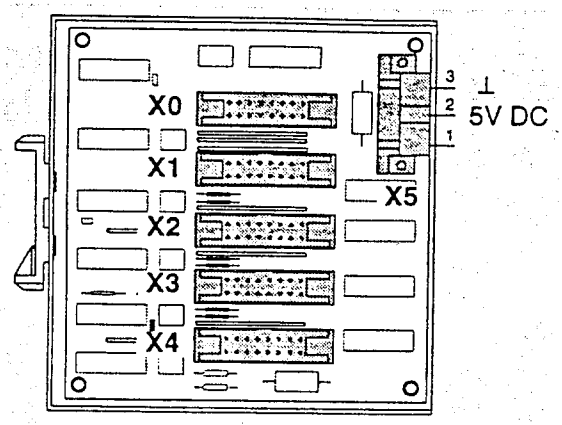
Galvanic decoupling of inputs/outputs with SEM and SAM

The job of the SAM and SEM modules is to provide electrical isolation between the inputs/outputs of the CP-TRONIC and external devices.
With the SAM, an EAK output switches a relay. 220 V can be switched directly using the relays' NO contacts.
On the SEM, an auxiliary voltage of 10V is generated from 21 V~ using a voltage regulator. This auxiliary voltage is fed to an opto-coupler via the switching contacts of the external device.
The transistor of the opto-coupler switches the 24 V through to the EAK input (OPEN EMITTER).

See the page headed "SAM and SEM schematics".

SVM Interface distributor module

Structure and task



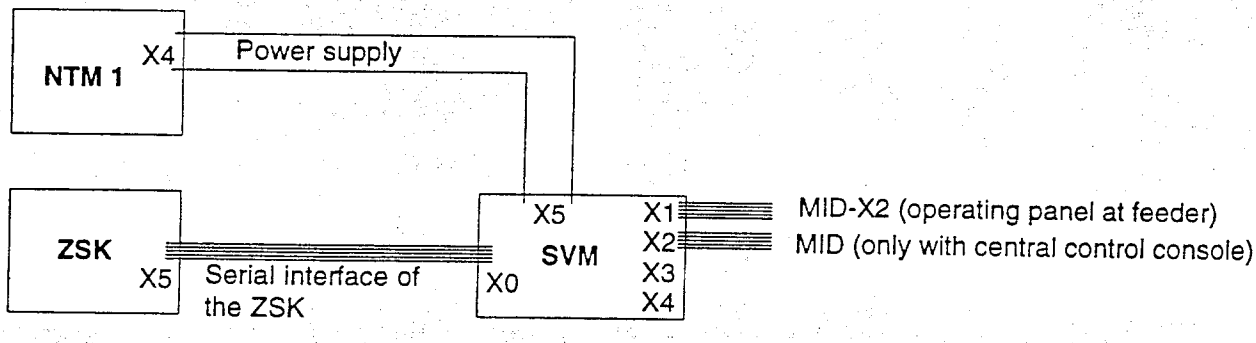
X0: input serial interface
X1...X4: output serial interfaces
X5: power supply

Interface distributor module SVM

The SVM multiplies (fans out) the serial interface of the ZSK. Per SVM 4 interfaces can be established (X1...X4).

The serial interfaces control the communication with the press displays (MID) and the external devices with serial interfaces.

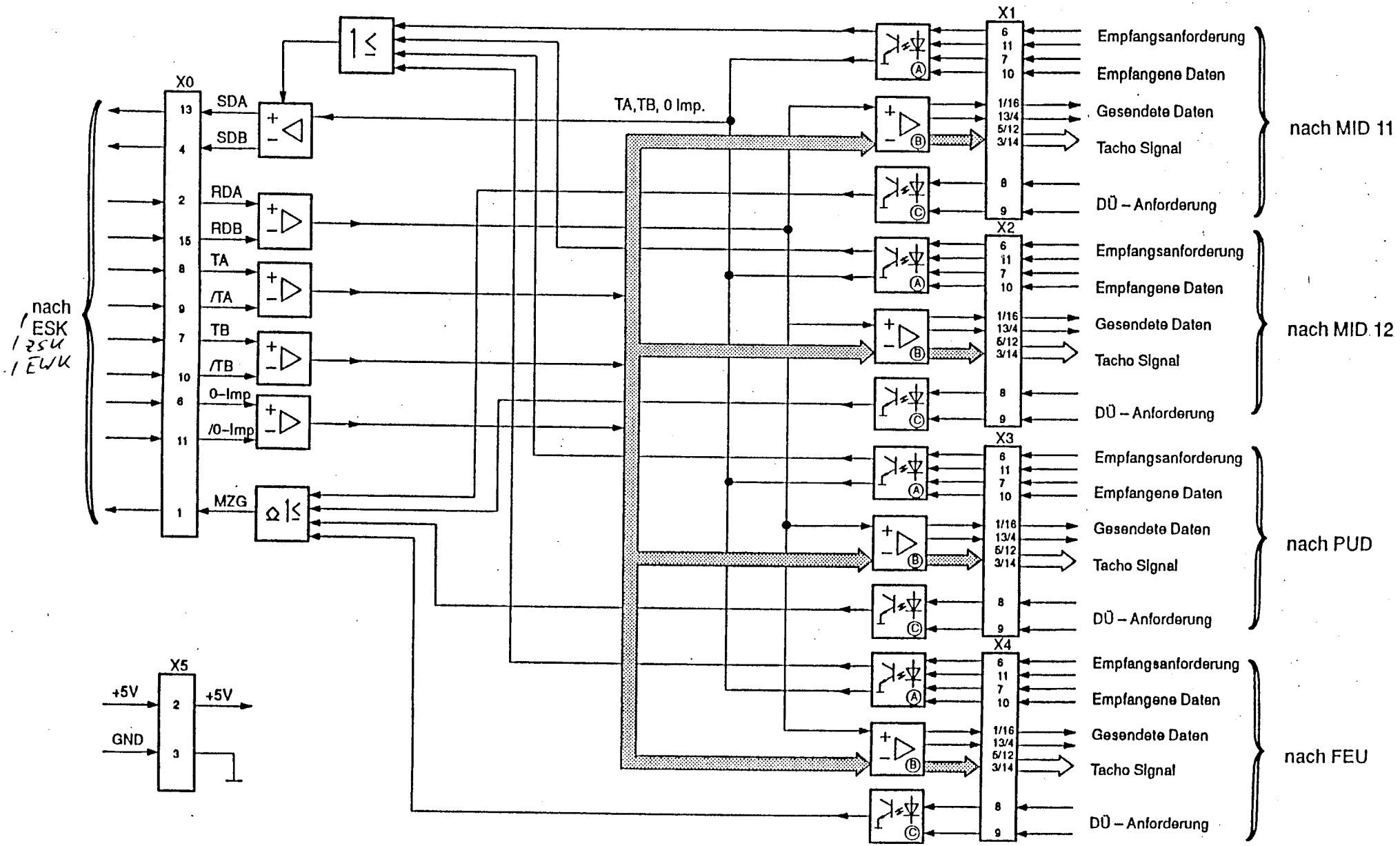
Connections

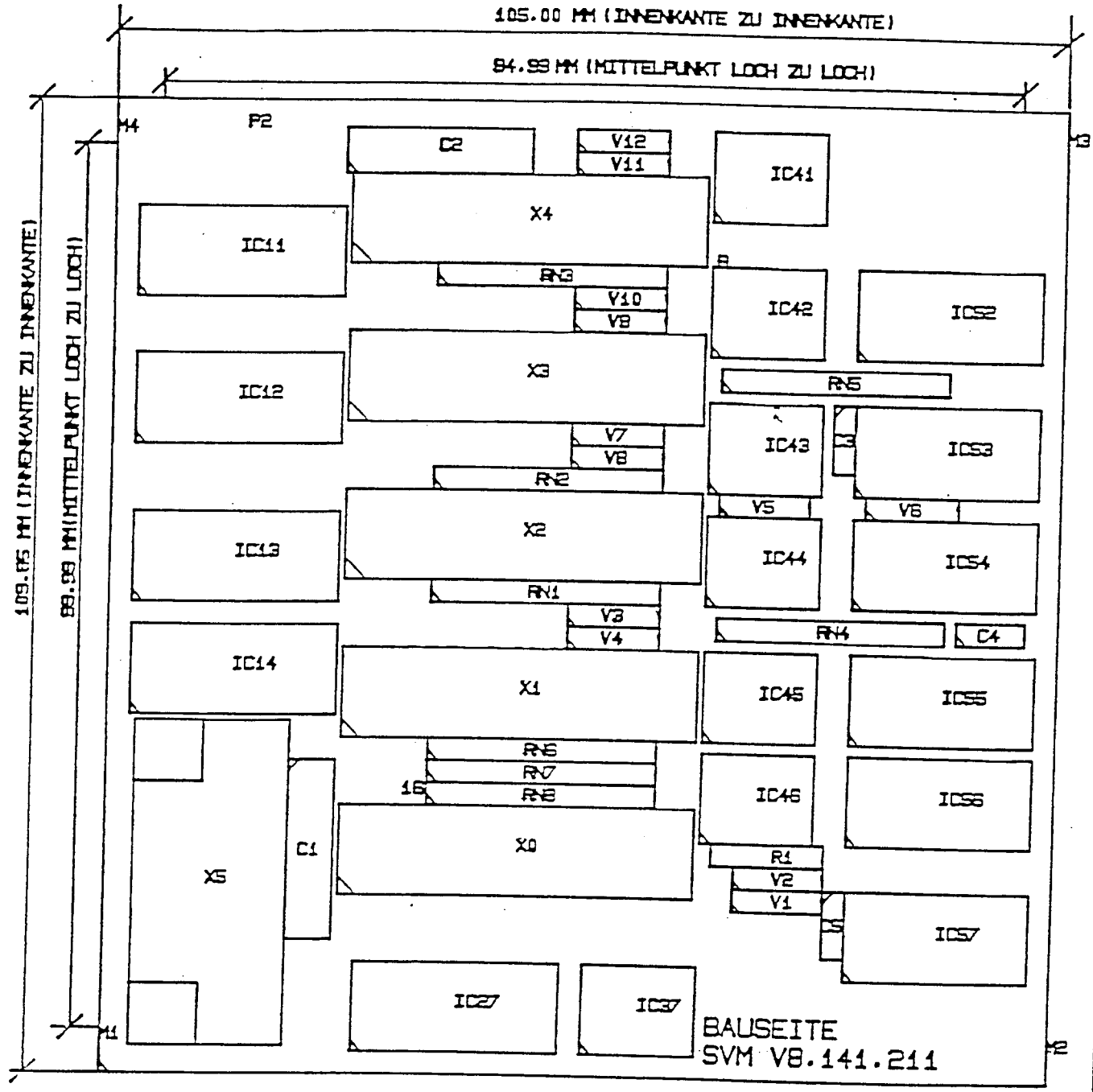


Connections of the SVM

Blockschaltbild SVM

HEIDELBERG



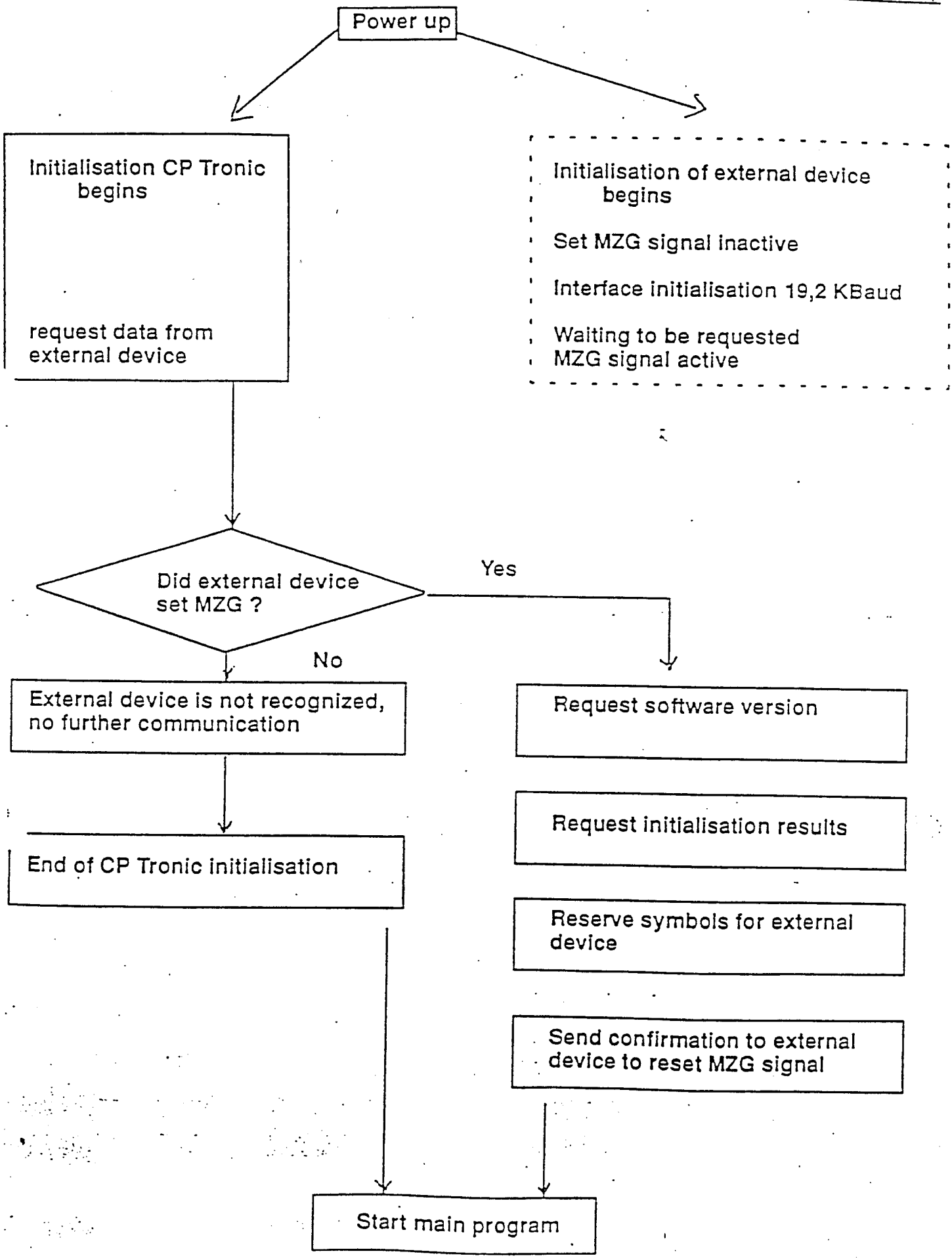


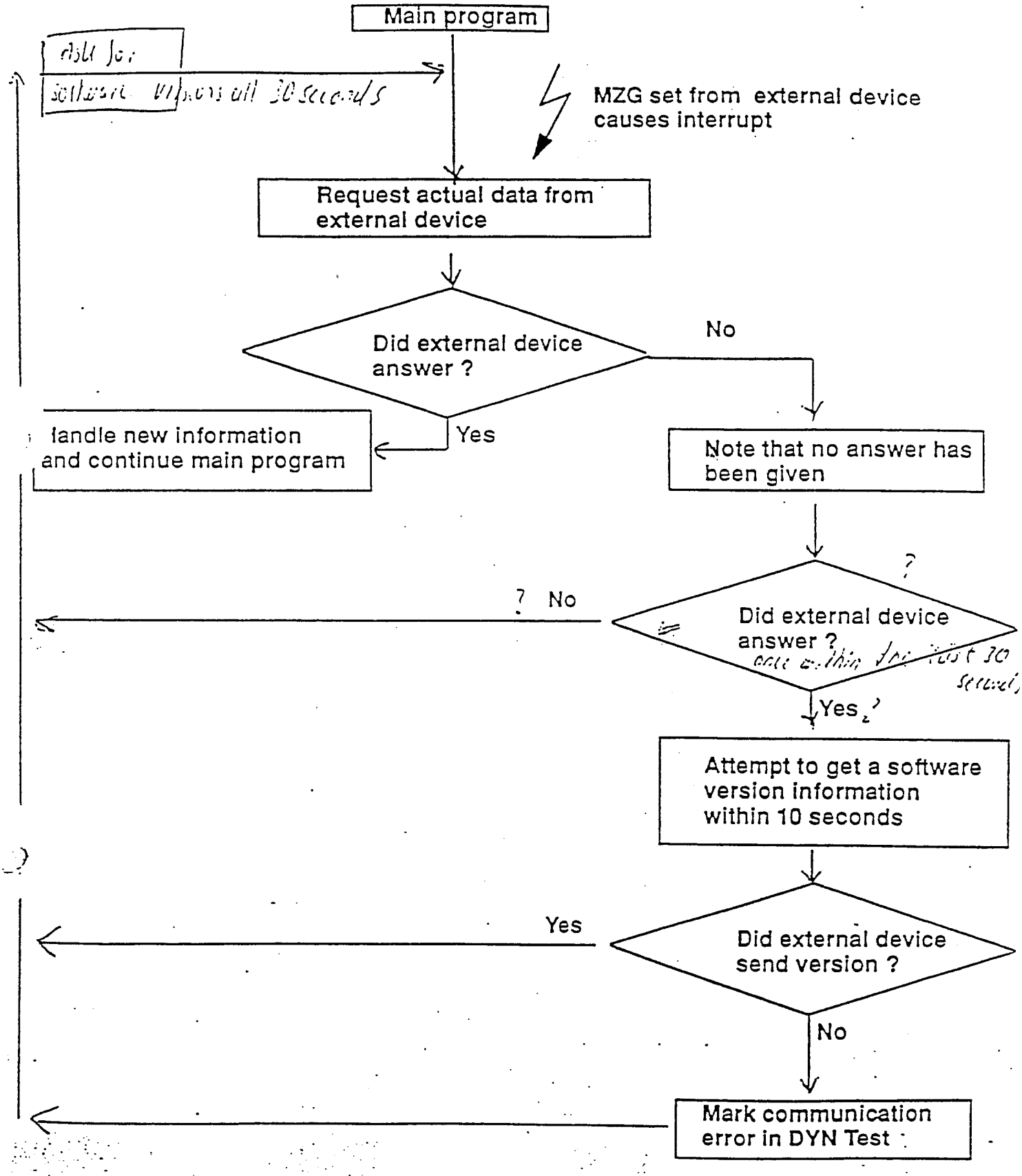
Heidelberger Druckmaschinen Aktiengesellschaft	Typ	Bl. Nr.	HDM-Nr.	Dat. / Name	
Datum	Urheberschutzvermerk nach DIN 34		Ersatz für	Änd.	
Gezeich.	Bestückungsplan SVM			Zeichnungs-Nr.	V8.141.211
Geprüft					

SDA / B	Send Data A/B	
RDA /B	Receive Data A/B	
MZG A/B	MZG – signal Request data from external device	
TSA	Signal speedometer track A	HWI – signals
/TSA		
TSB	Signal speedometer track B	
/TSB		
TS0	0 – pulse signal	
MS0		
SFA / B	Transmitter enable A/B (enabling SVM, if external device wants to send, remains active until the last byte)	
SVM	Interface description RS 422 / 485 Served by USART 8251 Asynchronous transmission 19,2 k Baud External devices work as slave	

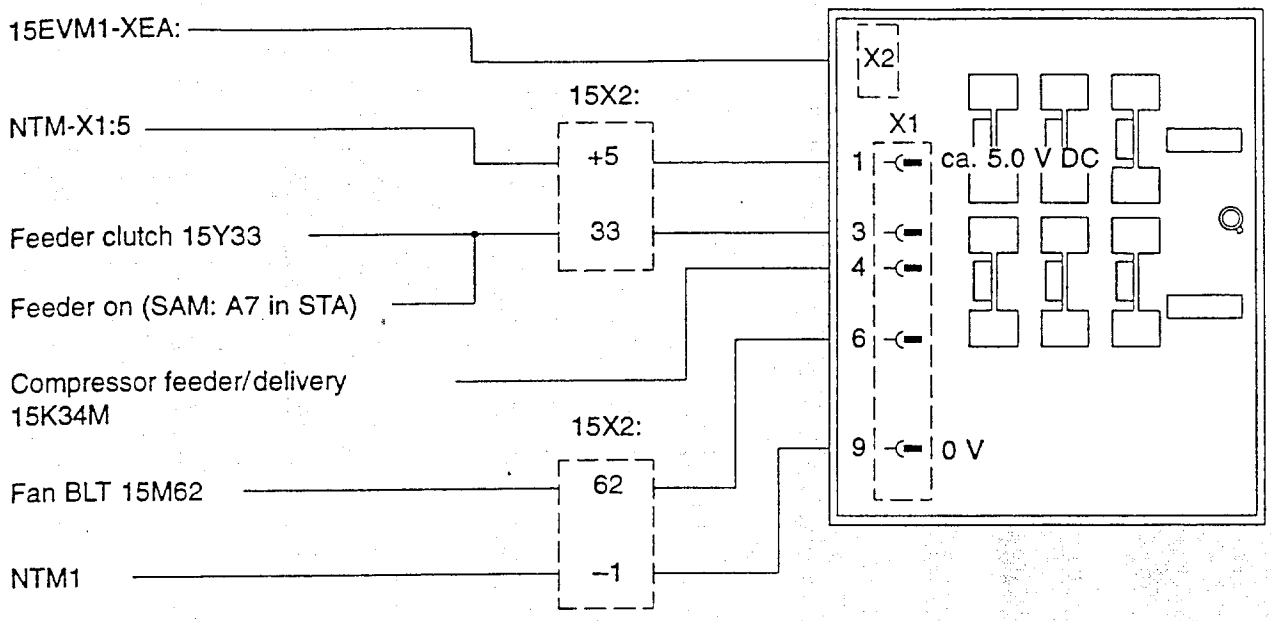
Communication with external devices

HEIDELBERG




Main program
MZG set from external device causes interrupt
Request actual data from external device
Did external device answer ?
No
Yes
handle new information and continue main program
Note that no answer has been given
Did external device answer ?
No
Yes
Attempt to get a software version information within 10 seconds
Did external device send version ?
Yes
No
Mark communication error in DYN Test

VSM Amplifier module



View and interconnection diagram of the amplifier module VSM

Connections

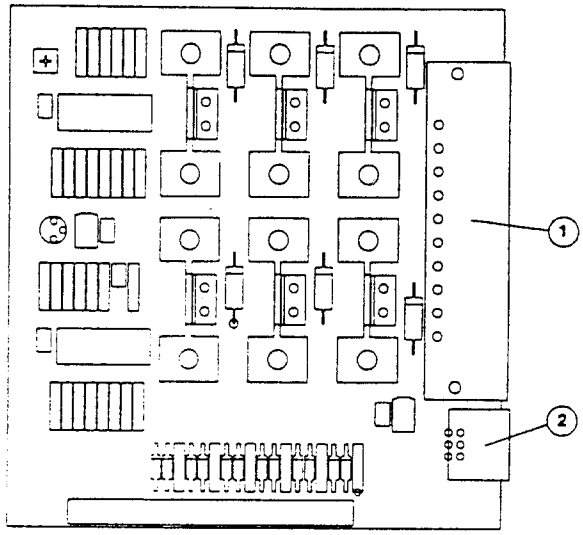
VSM-X1:3 → VSM-X2:5 → 15EVM1-XEA:33
VSM-X1:4 → VSM-X2:3 → 15EVM1-XEA:34
VSM-X1:6 → VSM-X2:2 → 15EVM1-XEA:62

Task

The outputs of the central control board ZSK or extension board EWK can switch an output power of max. 2.4 W.
If consumers with higher output are controlled, the amplifier module VSM is used.
Per output the VSM has a switching capacity of 48 W.

VSM2 Amplifier module

Layout

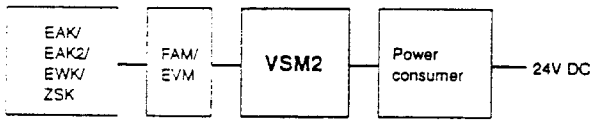


Amplifier module VSM2

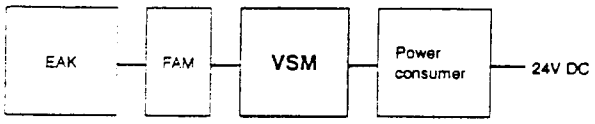
① X1 Pin base power supply unit, outputs

② X2 Pin base inputs

Task



Amplifier module VSM2



Amplifier module VSM at EAK

The amplifier module VSM2 increases the switching capacity of standard inputs/outputs modules of the EAK/EAK2/EWK and/or ZSK.

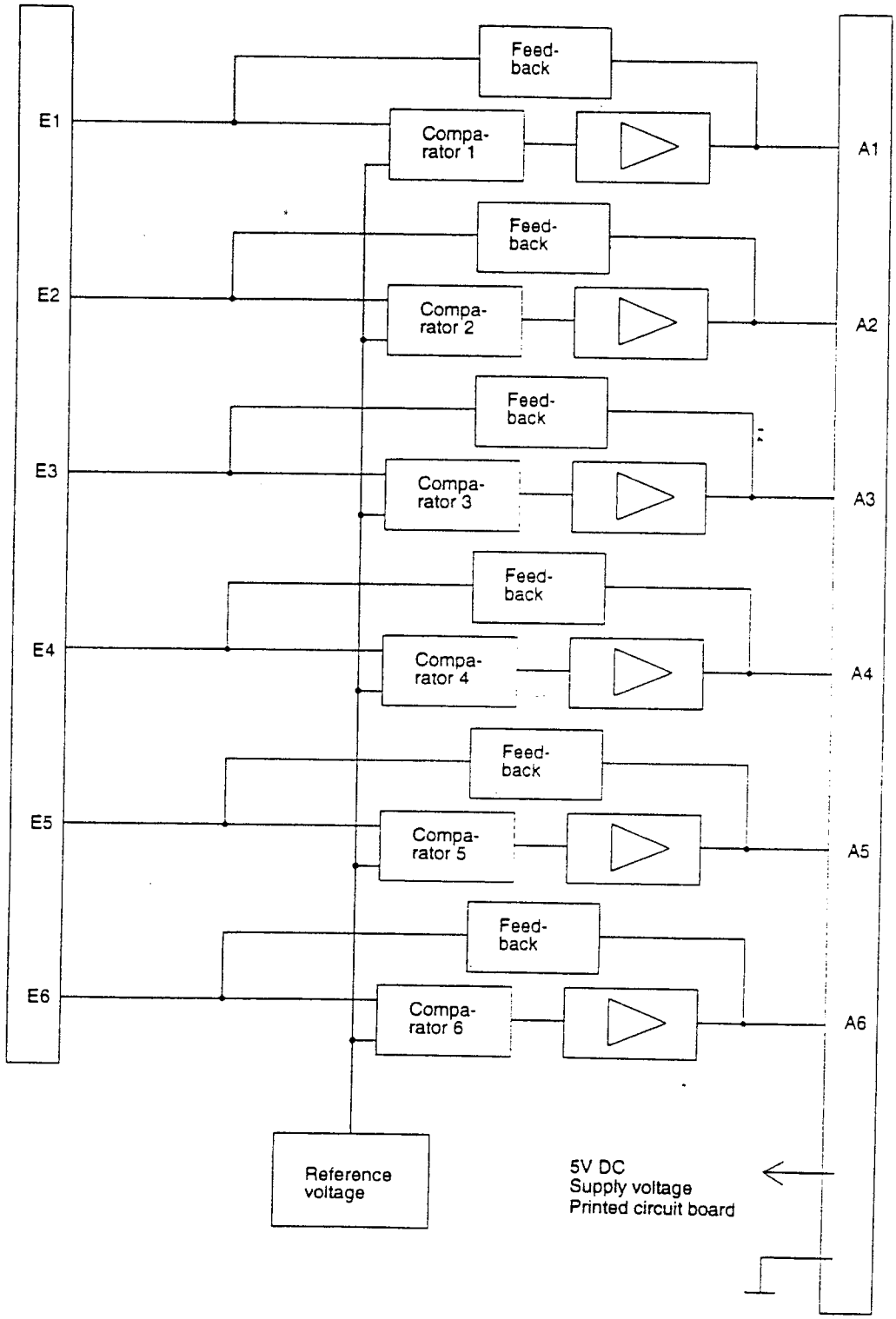
The switching capacity of an output of the EAK/EAK2/EWK and/or ZSK is 2.4W and is increased by the VSM2 to 48W (2A, 24V DC).

Power consumers, e.g. contactors and magnetic clutches are controlled with the VSM2.
No motors are to be controlled.

Note:

- The *VSM* is only to be operated with the EAK.
- The *VSM2* is used for EAK, EAK2, EWK and ZSK.

Block diagram



Simplified block diagram VSM2

Function

The supply voltage of the module is 5V DC.

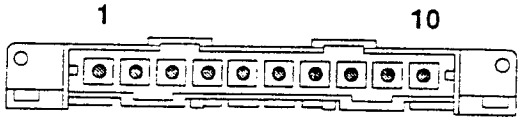
The controlling electronic board (EAK/ EAK2/EWK/ZSK) switches its output driver to actuate a power consumer (e.g. contactor, magnetic clutch).
This is recognized by the comparator and it triggers the output.

Feedback:

By means of the feedback the controlling electronic board recognizes whether a power consumer is connected.

Pin assignment

X1

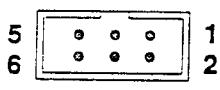


Pin base X1

X1 Pin base power supply unit, outputs

Pin	Function
1	5V DC
2	not used
3	Output 1
4	Output 2
5	Output 3
6	Output 4
7	Output 5
8	Output 6
9	⊥5V[1]
10	⊥5V[1]

X2



Pin base X2

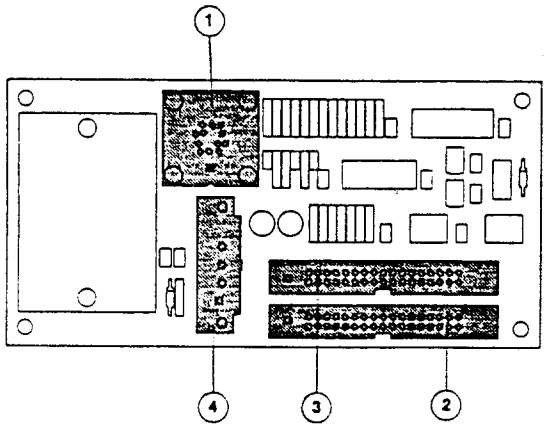
X2 Pin base inputs

Pin	Function
1	Input 1
2	Input 2
3	Input 3
4	Input 4
5	Input 5
6	Input 6

[1] Both earthing contacts must be connected to ensure reliable function.

TEM Tacho input module

Layout



Tacho input module TEM

① X2 socket base 12pole;
plug connection to the press tacho

② X3 pin base 34pole;
plug connection to the LTM300 (perfecting device)

③ X4 Pin base 34pole;
plug connection to the EWK

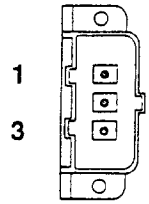
④ X1 Pin base 3pole;
plug connection to the power supply module NTM

Function

The tacho input module acquires the tacho signals of the press tachometer which is responsible for the perfecting device. The acquired tacho signals are fed into the interface between the power part LTM300 and the EWK. This enables a very accurate detection of the press position. An additional function of the tacho input module is to provide the power supply of the press tachometer.

Pin assignment

X1

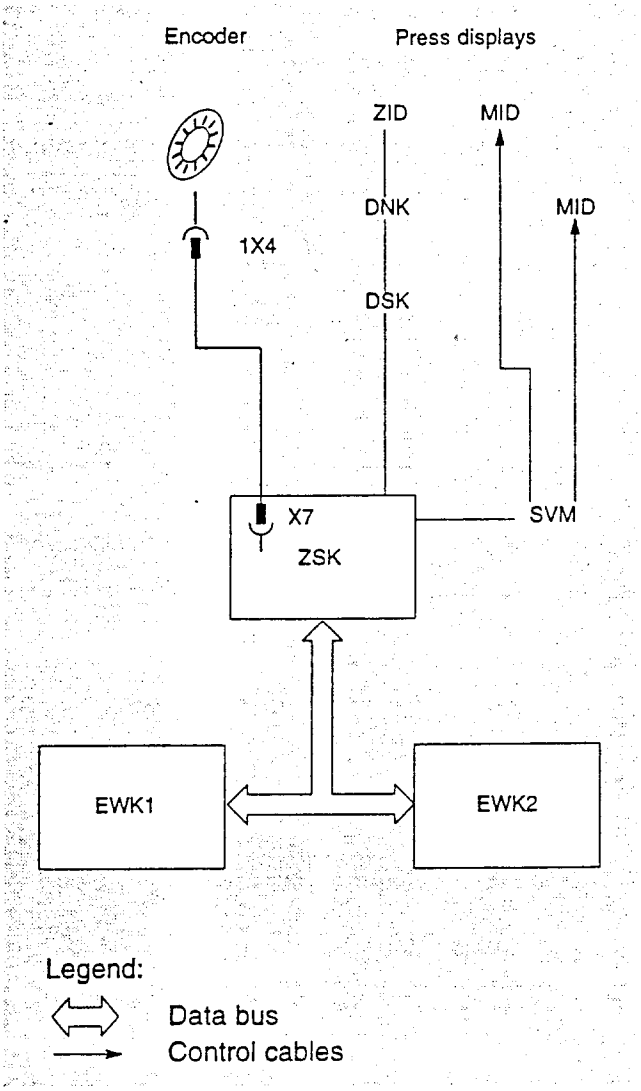


Pin base X1, 3pole

X1 Plug connection to the NTM

Pin	Function
1	+24V DC
2	⊥ 24V

Block diagram



Block diagram

The light receivers register the optical pulses and convert them into electrical pulses.

Depending on the function, the evaluation of the electrical pulses
- for speed
- for degree
- for direction of rotation

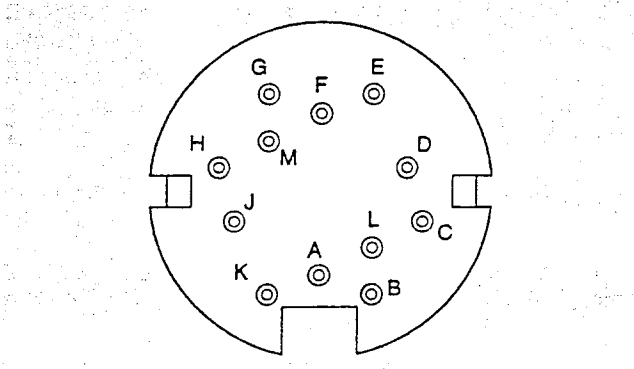
is effected on
- the central control board ZSK or
- the extension board EWK.

Depending on the operating mode, either the preset speed or the degree value is displayed in the ZID (production run display) and in the MID. The preset speed or degree appears after the initialization, when the zero pulse was registered for the first time.

The preset speed appears
- when the press is on "Run".

The degree value appears
- at standstill of the press,
- in inching mode,
- during positioning,
- during crawl speed.

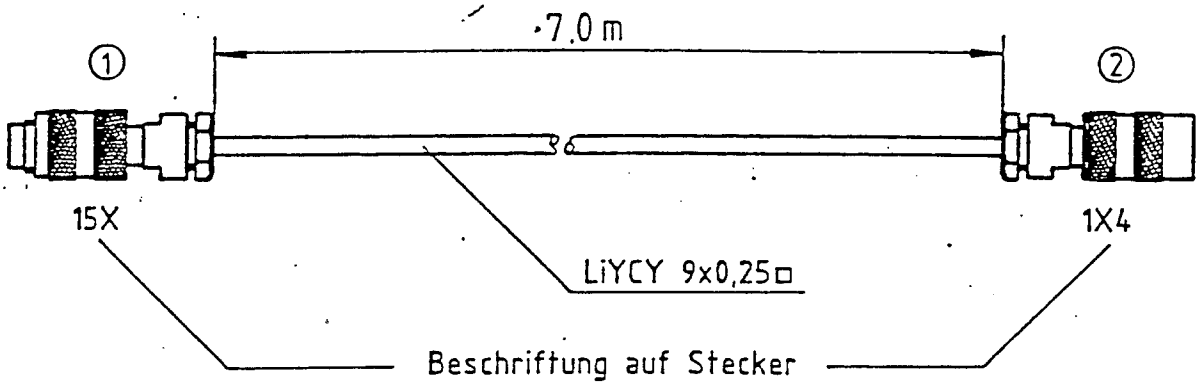
Pin assignment



Plug 1X4 of the encoder

Pin	Function
M, G, H	+5V DC
A, L, D	M5 (0V)
C	Track $\overline{A}$
B	Track A
F	Track $\overline{B}$
E	Track B
K	Track $\overline{0}$
J	Track 0

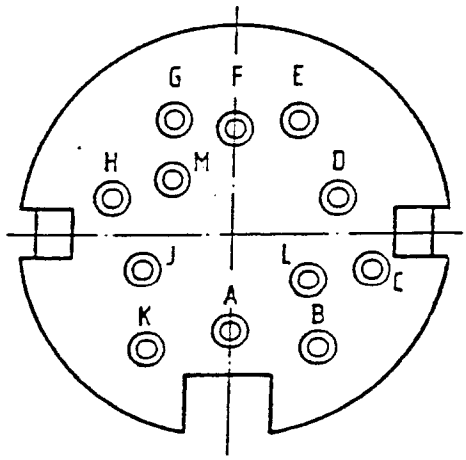
Heidelberger Druckmaschinen Aktiengesellschaft	Anschlußleitung Hohlwelleninkrementalgeber Speedmaster 72/102 und CD 102	C-Steuerung V8.148.057



Kontakt-Nr.	Funktion	Farbe
A	Masse	weiß
B	Spur B	gelb
C	Spur B	grau
D	Masse	—
E	Spur A	braun
F	Spur A	grün
G	+ US	rosa
H	+ US	—
I	0-Impuls	blau
K	0-Impuls	rot
L	Masse	—
M	+ US	—

A,D,L im Stecker gebrückt
G,H,M im Stecker gebrückt

Schirm auf Masse gelegt
at Rückwand RER



Binder Serie 723

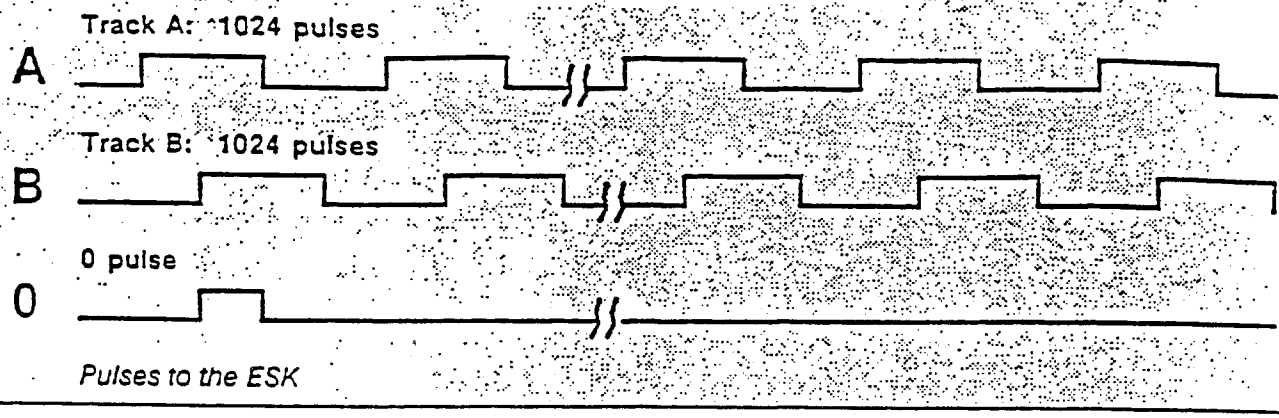
① Kupplungsstecker
09-0129-70-12

② Kupplungsdose
09-0130-70-12

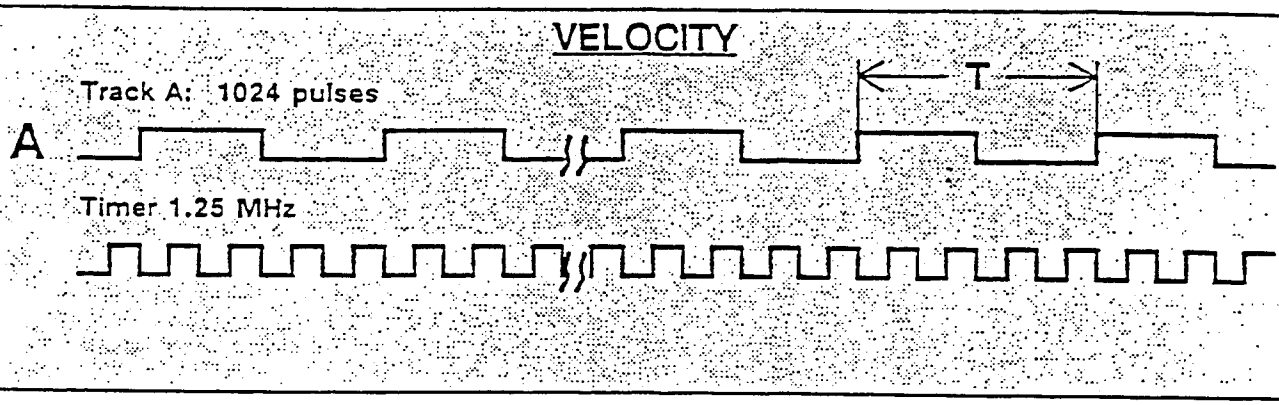
Ansicht auf Anschlußseite
Steckereinsatz

Gez.	Sachb.	Gen.	Ausgabe			
Schupp						

PULSE TRAIN HWI

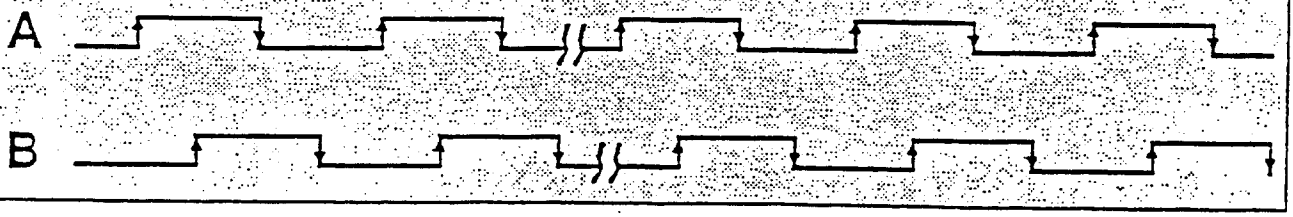


VELOCITY

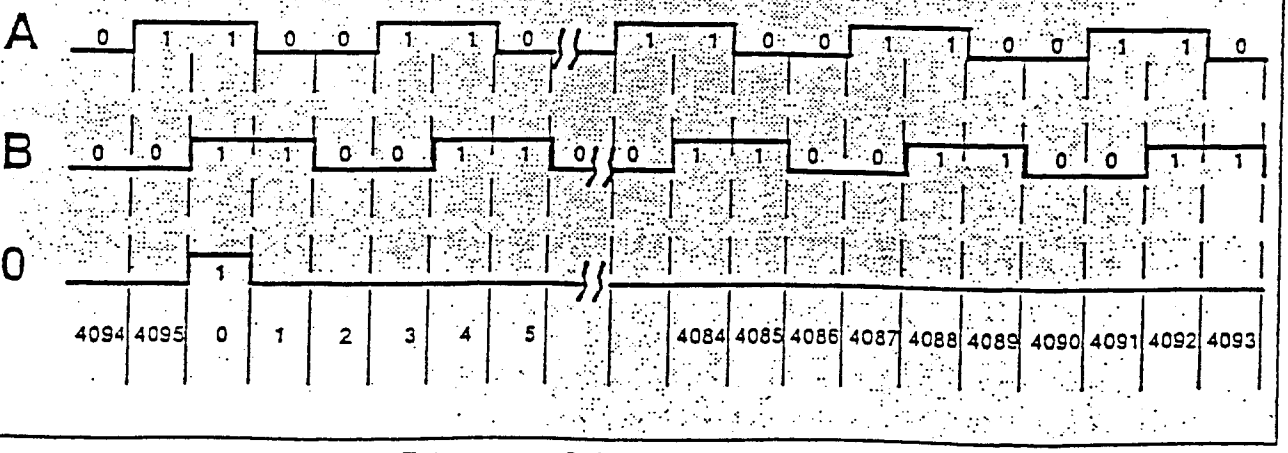


ROTATION RECOGNITION

rising edge A – rising edge B: CLOCKWISE ROTATION
rising edge A – falling edge B: COUNTERCLOCKWISE ROTATION



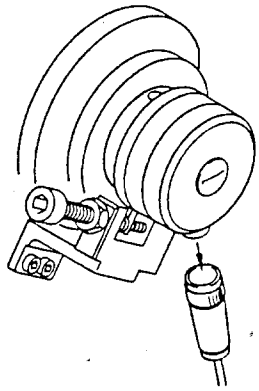
PRESS ANGLE



Tolerance ± 0.5%

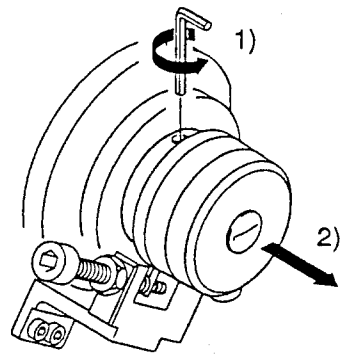
Removal and installation

1



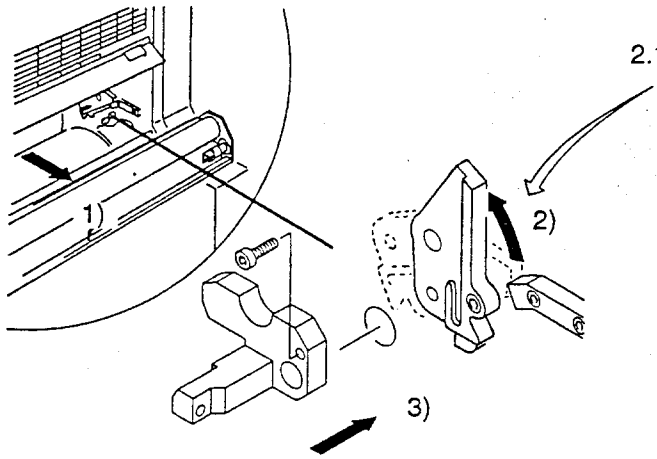
– Withdraw the plug from the encoder.

2

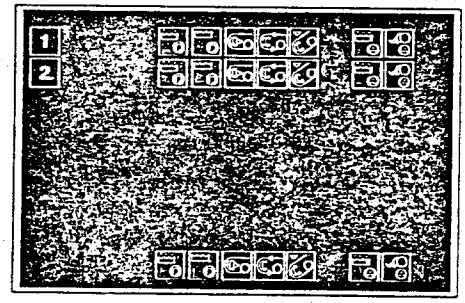


– Loosen the stud.
– Remove the encoder.

3

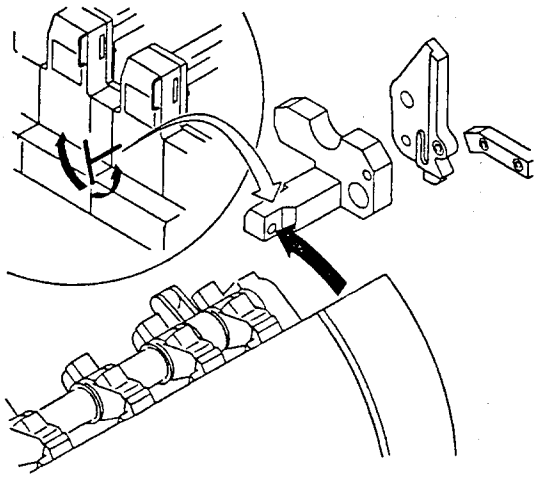


2.1) 2.2) 2.3) 1 2.4)



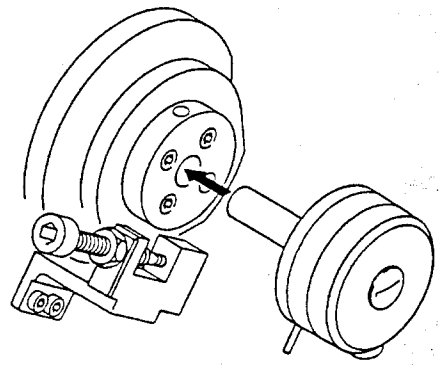
– Remove the blanket washup device from PU1.
– Swing down the blanket washup device into the position "Wash impression cylinder".
– Insert the gauge into the side frame.

4



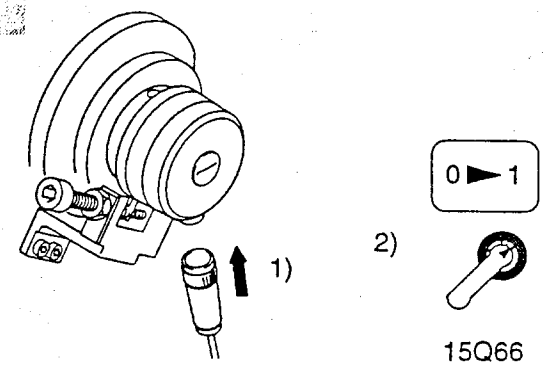
– Turn the impression cylinder until it contacts the gauge.

5



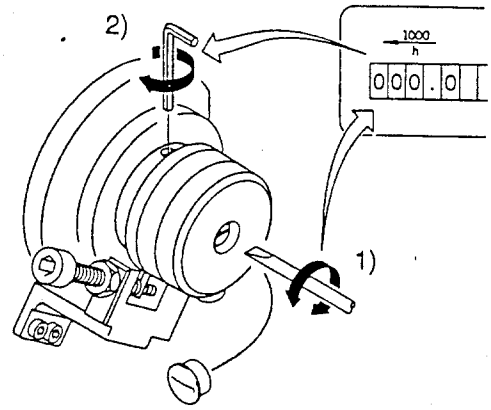
– Fit the new encoder.

6



- Connect the encoder.
- Switch on the main switch 15Q66.

7



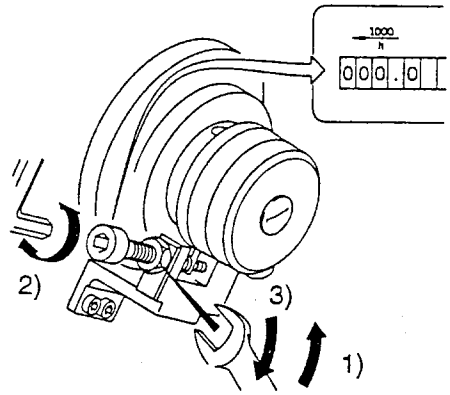
- Turn the shaft of the encoder until 000.0 appears in the MID.
- Tighten the stud.

8

- Precision adjustment (fig. 9):
  if there is a deviation from the value "000.0" (MID display) set as described in fig. 7.

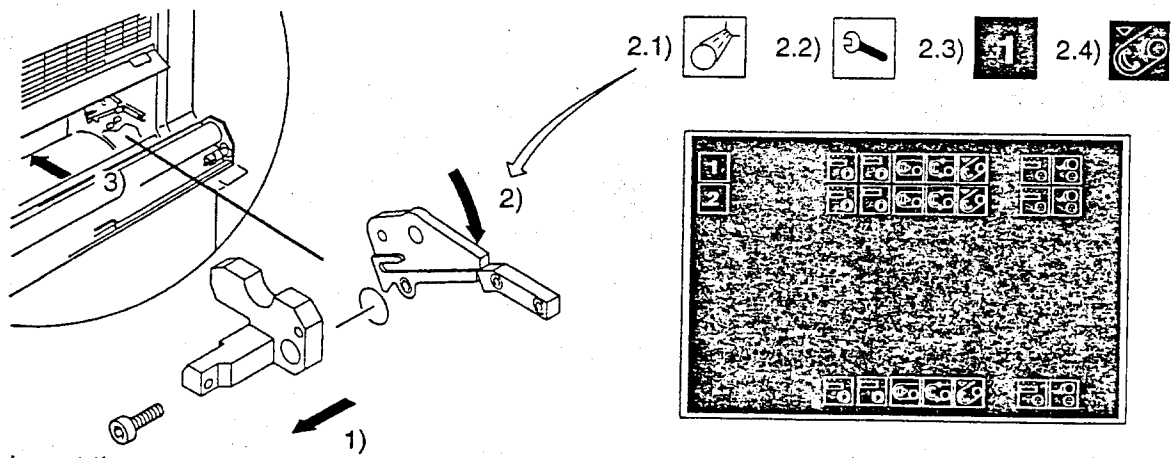
- No precision adjustment:
  continue with fig. 10.

9



- Loosen the locking nut.
- Turn the adjusting screw until 000.0 appears in the MID.
- Tighten the locking nut.

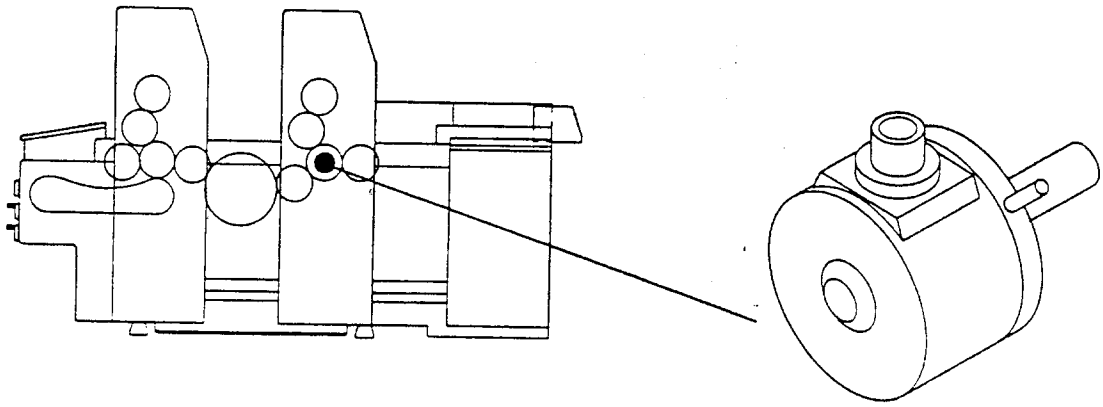
10



- Take out the gauge.
- Swing the blanket washup device into its initial position.
- Install the blanket washup device.

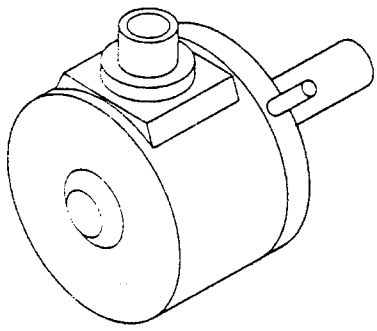
IDS Encoder

Place of installation



Operator side of PU1

Design and task



Encoder

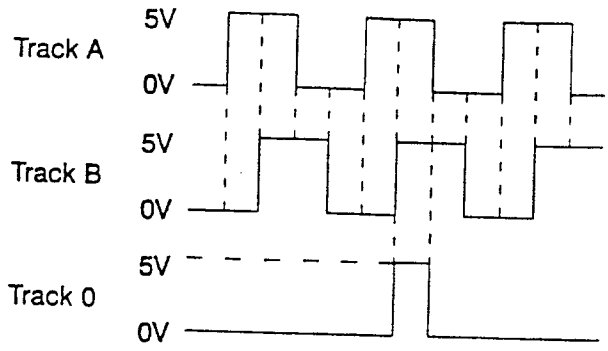
The most important components of the encoder are:

- light sources
- light receivers
- a rotatable glass segment disk.

The encoder is the basis for all functions depending on speed and degree values.

Examples of speed– and degree–dependent functions:

- motor control
- interrogation points of sensors
- positioning for plate change.



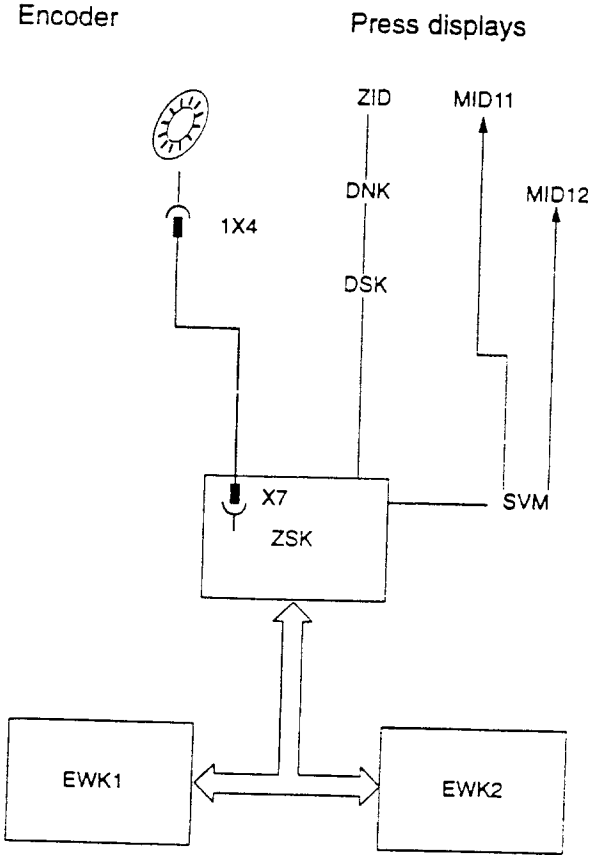
Pulse signals

The encoder generates three pulse signals:

- track A,
- track B,
- track 0.

Track B is staggered by 90° in relation to track A. Per revolution track 0 generates one zero pulse. The inverted signals are also available from all 3 tracks.
Tracks A and B generate 1024 pulses per revolution per track.

Block diagram



Block diagram

The light receivers register the optical pulses and convert them into electrical pulses.

The evaluation of the electrical pulses

- for speed,
- for degree,
- for direction of rotation

is effected on the input/output control board ESK.

Depending on the operating mode, either the speed or the degree value is displayed in the ZID (production run display) and in the MID. The speed or degree appears after the initialization, when the zero pulse was registered for the first time.

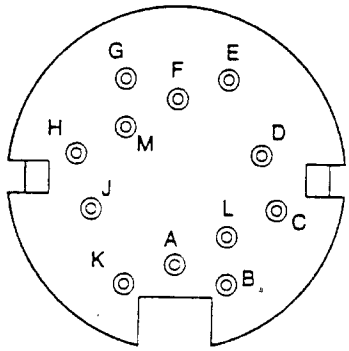
The speed appears

- when the press is on "Run".

The degree value appears

- at standstill of the press,
- in inching mode,
- during positioning,
- during crawl speed.

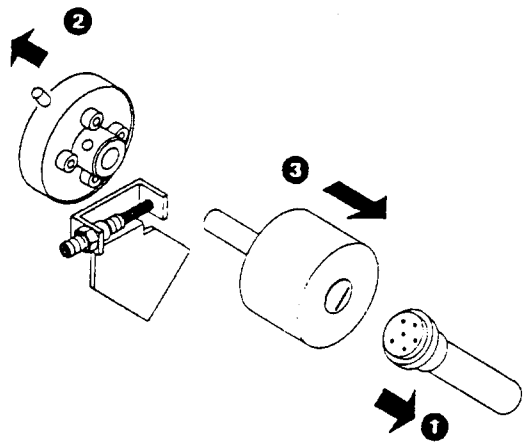
Pin assignment



Plug 1X4

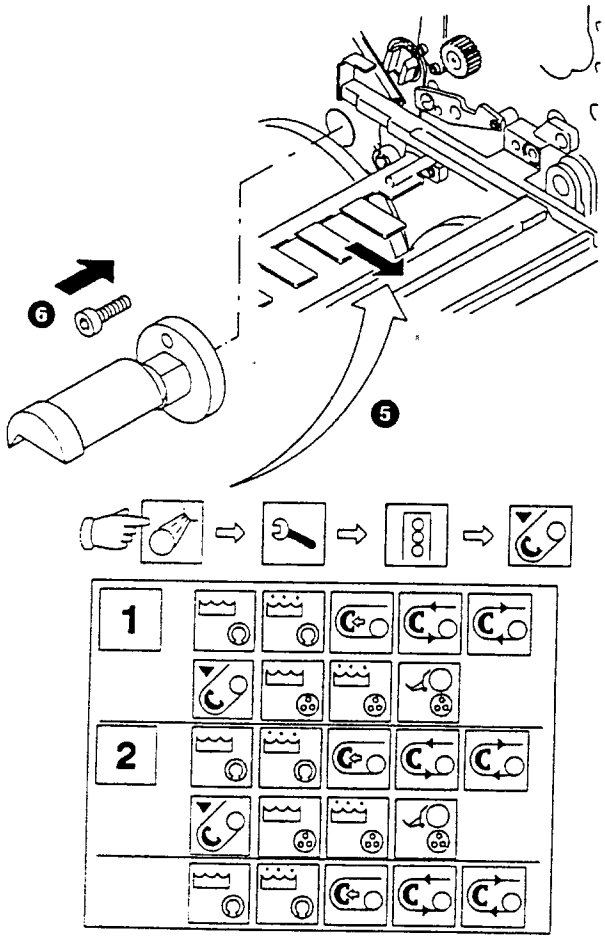
Pin	Function
M, G, H	+5V DC
A, L, D	M5 (0V)
C	Track $\overline{A}$
B	Track A
F	Track $\overline{B}$
E	Track B
K	Track $\overline{0}$
J	Track 0

Removal and installation



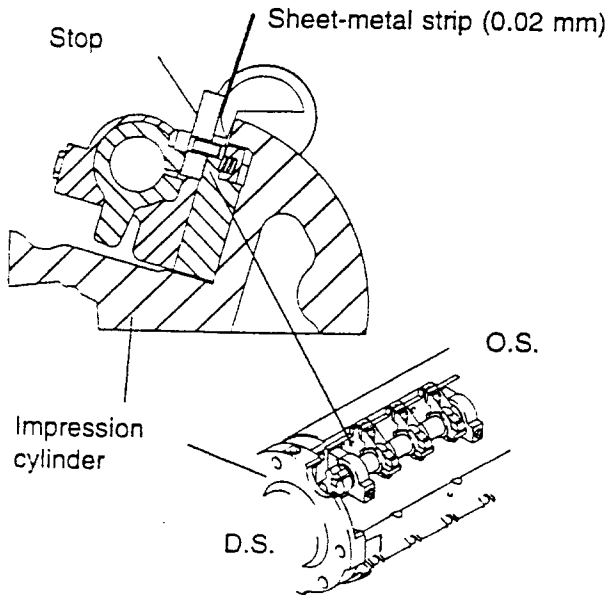
Removing encoder

1. Pull off plug at the encoder.
2. Loosen stud.
3. Remove encoder.



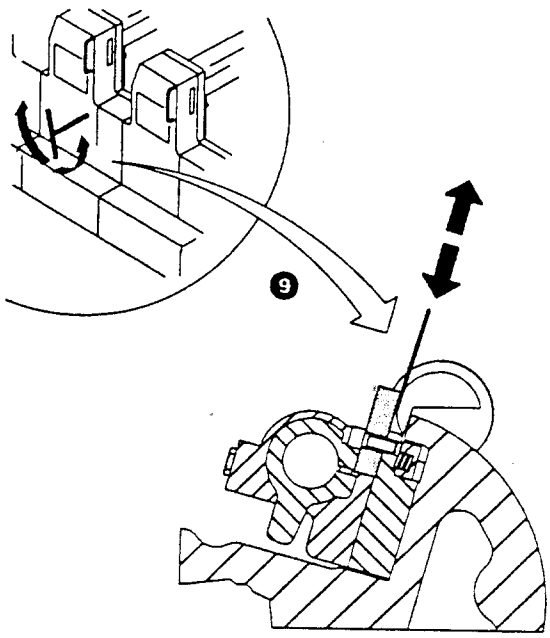
Insert gauge

4. Remove blanket wash–up device GTW at PU1.
5. Swivel GTW to „Wash–up impression cylinder".
6. Insert gauge in the frame (D.S.).



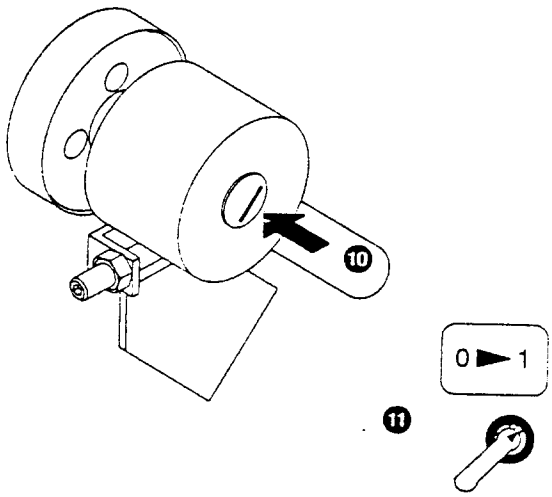
Mount stop

7. Mount stop on D.S..
8. Insert a sheet–metal strip (0.02 mm) between stop and gauge.



Positioning the press

❾ Position the press so that the sheet–metal strip can just be moved.

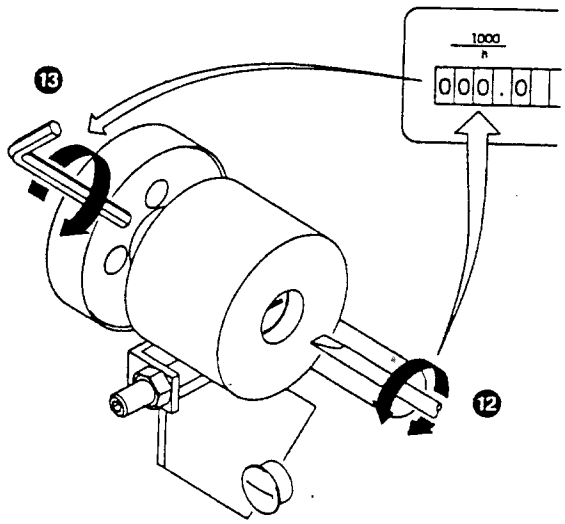


15Q66

Installing encoder

❿ Install new encoder and connect it.

⓫ Switch on main switch.



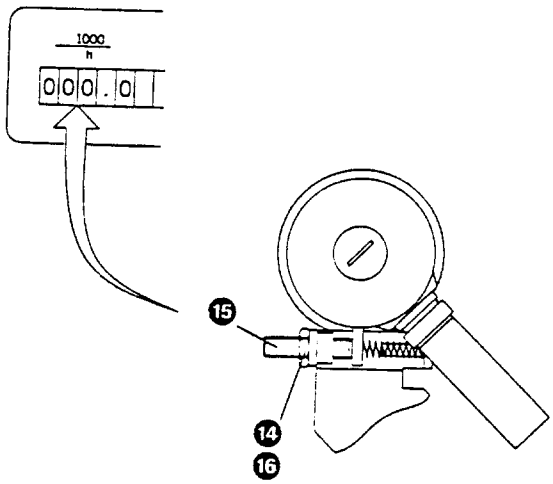
Setting encoder

⓬ Turn the shaft of the encoder until 000.0 is displayed in the MID.

⓭ Tighten stud.

Note:

Precision setting:
Only if the setting value "000.0" deviates in the MID.



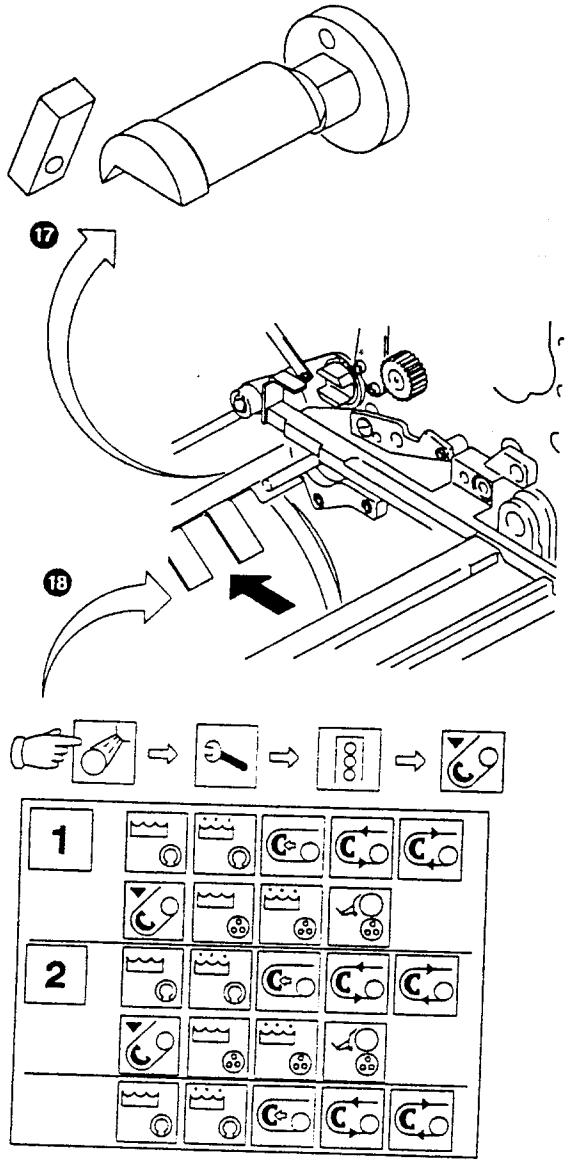
Performing precision setting

Precision setting:

⓮ Undo locking nut.

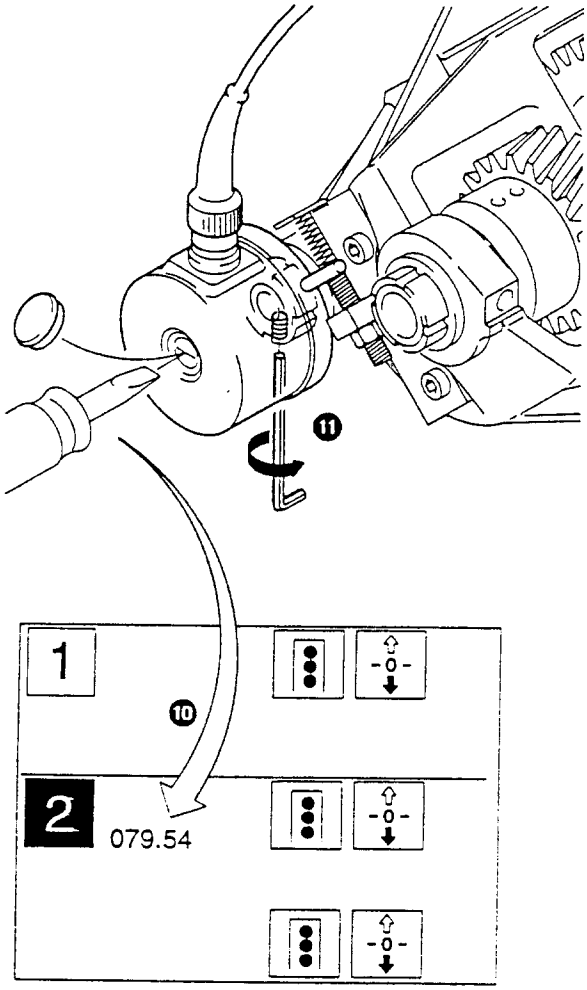
⓯ Turn adjusting screw until 000.0 is displayed in the MID.

⓰ Tighten locking nut.



Removal of gauge

17. Remove gauge and stop.
18. Swivel GTW to basic position.
19. Install GTW.

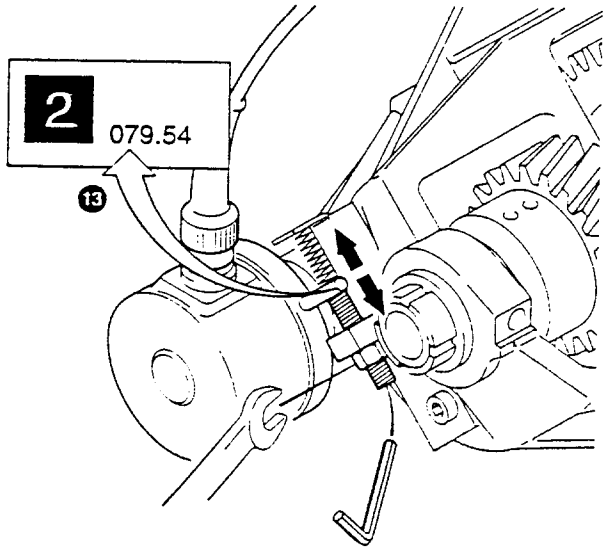


Adjusting encoder

⑩ Turn the shaft of the encoder until 079.5 appears in the service display.

⑪ Tighten stud.

Note:
Precision setting:
Only if the setting value "079.54" deviates in the MID.



Precision setting of the encoder

Precision setting:

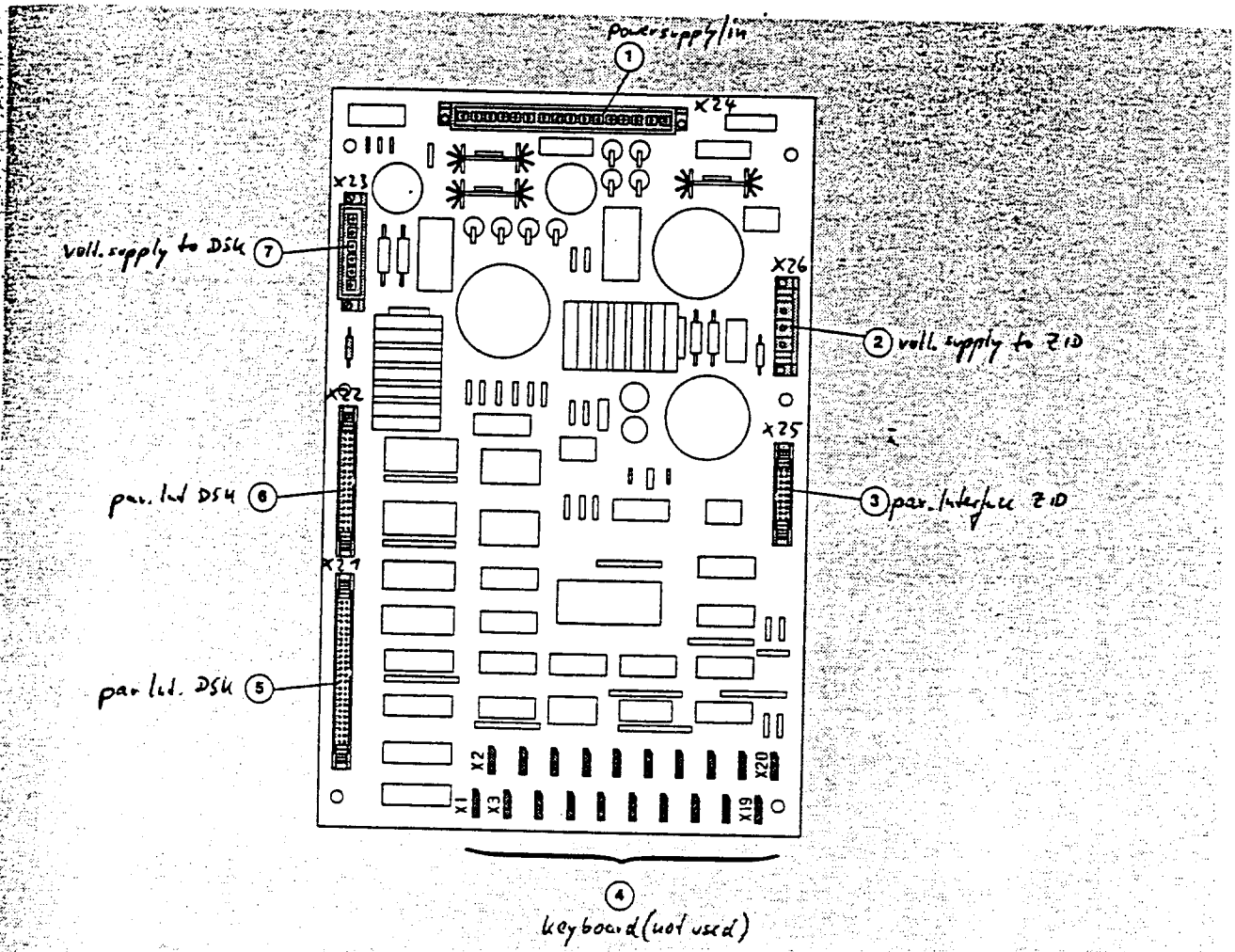
⑫ Undo locking nut.

⑬ Turn adjusting screw until 079.54 is displayed in the MID.

⑭ Tighten locking nut.

DNK Display power supply board

Layout



Display power supply board DNK

① X24 Pin base voltage supply DNK

② X26 Socket base
voltage supply (ZID)

③ X25 Pin base parallel interface (ZID)

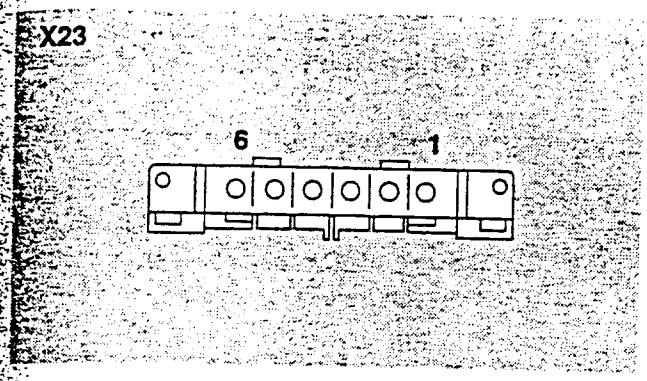
④ X1...X20 not assigned

⑤ X21 Pin base parallel interface (DSK)

⑥ X22 Pin base parallel interface (DSK)

⑦ X23 Socket base
voltage supply (DSK)

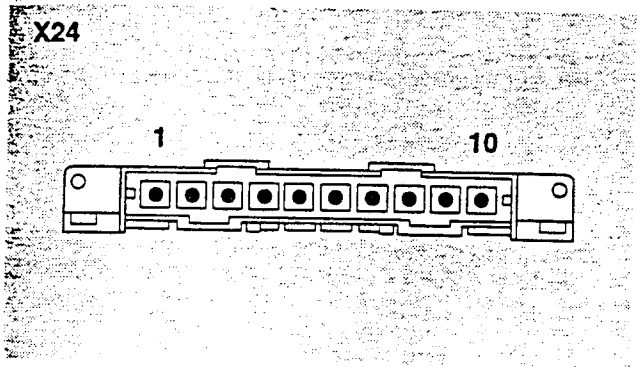
Plug assignment



Socket base X23

X23 Socket base voltage supply (DSK)

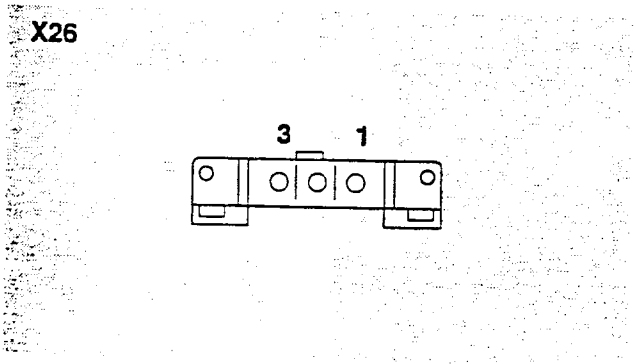
Pin	Function[1]	Function[2]
1	5V DC[3]	0.4V DC[3]
2	5V DC	5V DC
3	⊥ 5V	⊥ 5V
4	⊥ 5V	⊥ 5V
5	⊥ 5V	⊥ 5V
6	Signal SD[3]	open[3]



Pin base X24

X24 Pin base voltage supply DNK

Pin	Function[1]
1	15V AC
2	15V AC
3	20V AC
4	20V AC
5	20V AC
6	20V AC
7	27V AC
8	27V AC
9...16	Code



Socket base X26

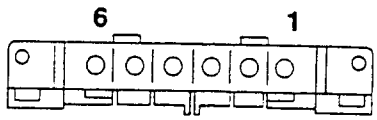
X26 Socket base voltage supply (ZID)

Pin	Function[1]	Function[2]
1	5V DC	205V DC
2	–205V DC	0V[4]
3	–200V DC	5V DC

[1] Plug inserted
[2] Plug *not* inserted
[3] Signal SD is the back-looped signal "earth" to DNK. 5V DC of DNK are reduced electronically, if plug DNK-X23/DSK-X4 is not inserted.
[4] Reference potential for pins 1 and 3

Pin assignment

X23

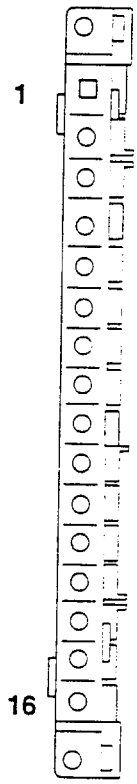


Socket base X23

X23 Socket base / power supply (DSK)

Pin	Function
1	5V DC[1]
2	5V DC
3	⊥ 5V
4	⊥ 5V
5	⊥ 5V
6	Signal SD[1]

X24



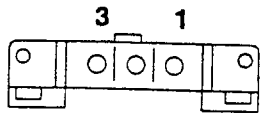
Pin base X24

X24 Pin base / power supply DNK2

Pin	Function[1]
1	15V AC
2	15V AC
3	20V AC
4	20V AC
5	20V AC
6	20V AC
7	27V AC
8	27V AC
9...16	Code DNK2

[1] The signal SD is the signal "Ground" returned by the DNK. 5V DC of the DNK are electronically stepped down, if the plug DNK-X23/DSK-X4 is not inserted.

X26

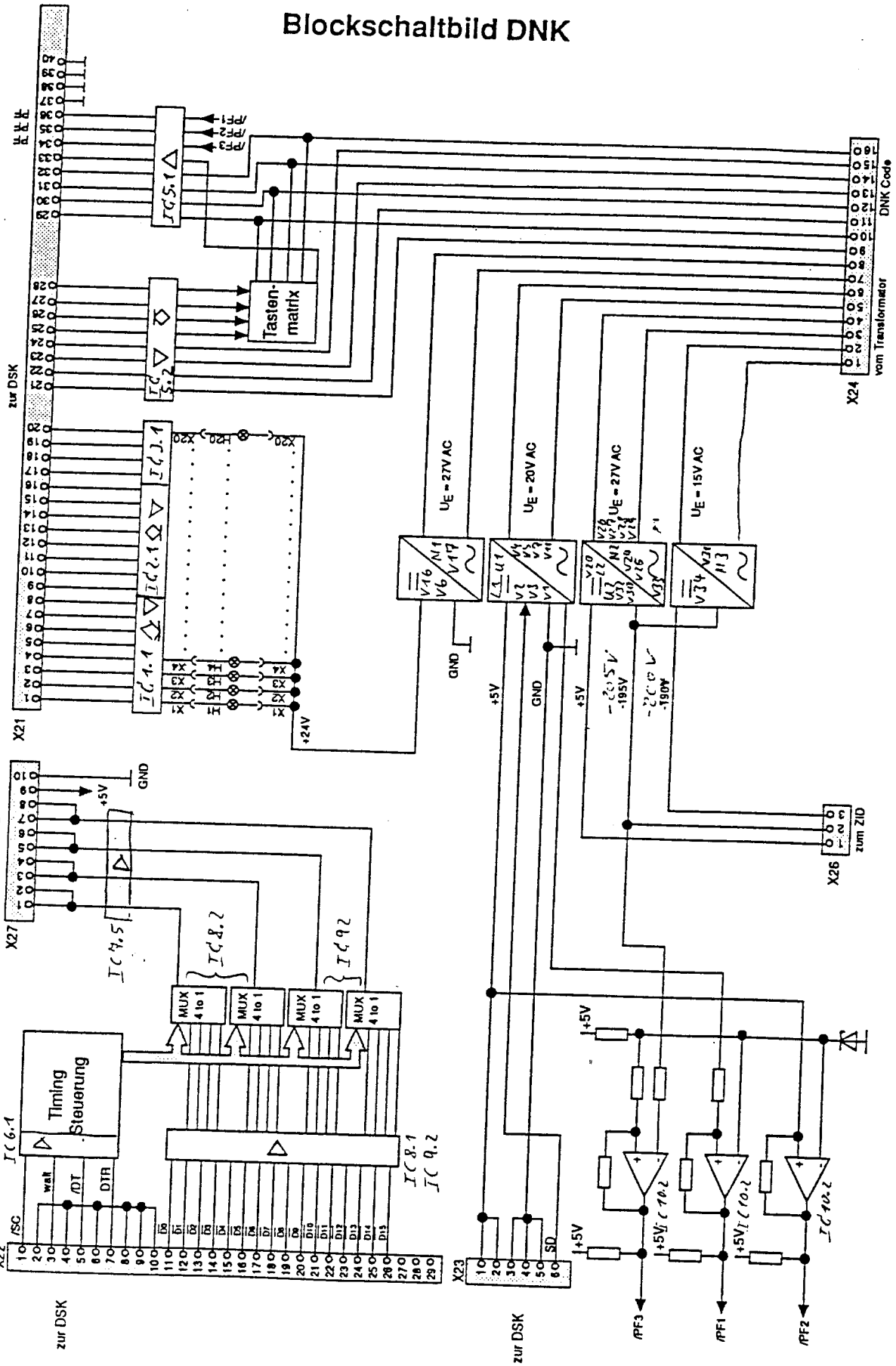


Socket base X26

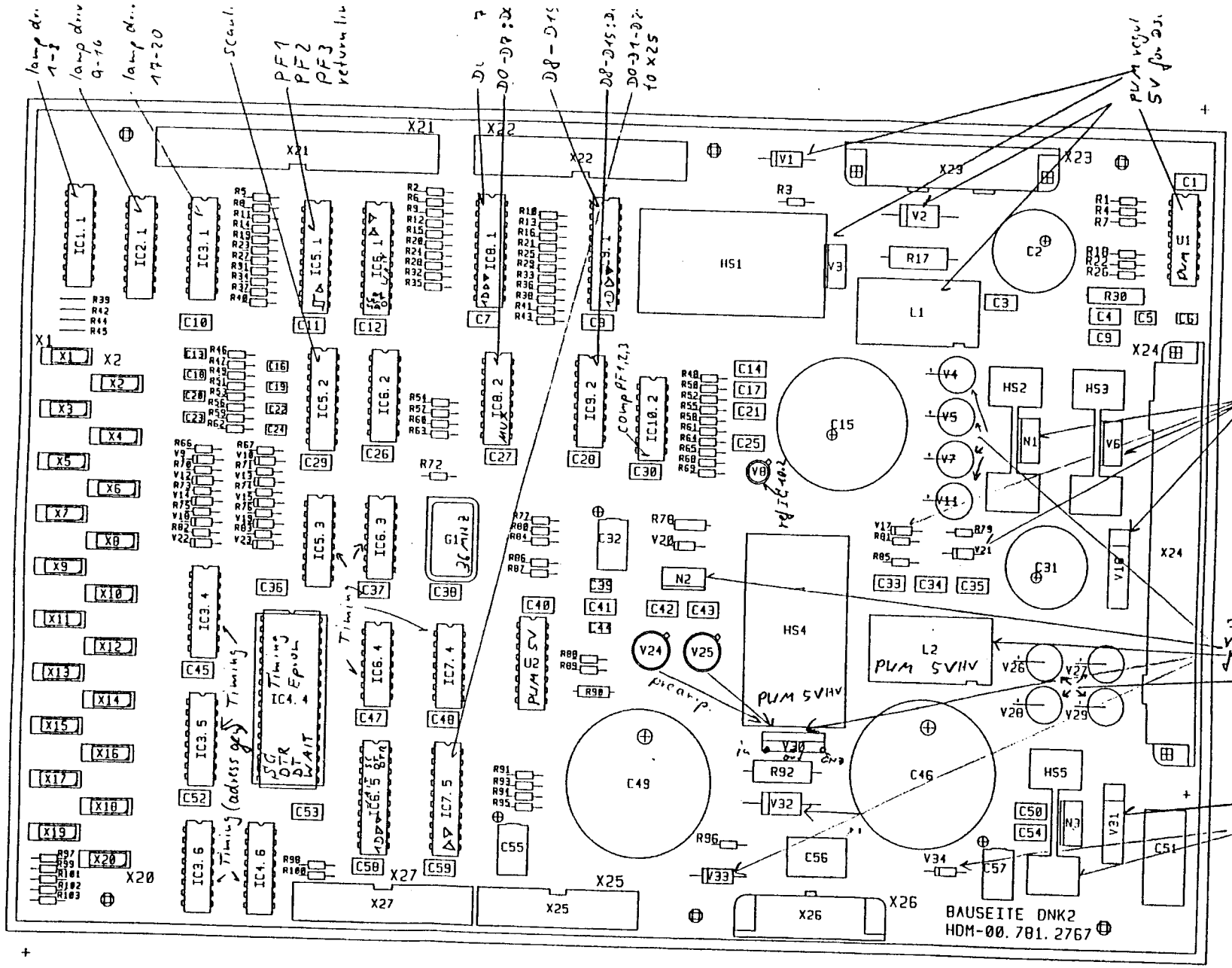
X26 Socket base / power supply (ZID)

Pin	Function
1	5V DC
2	–195V DC
3	–190V DC

Blockschaltbild DNK

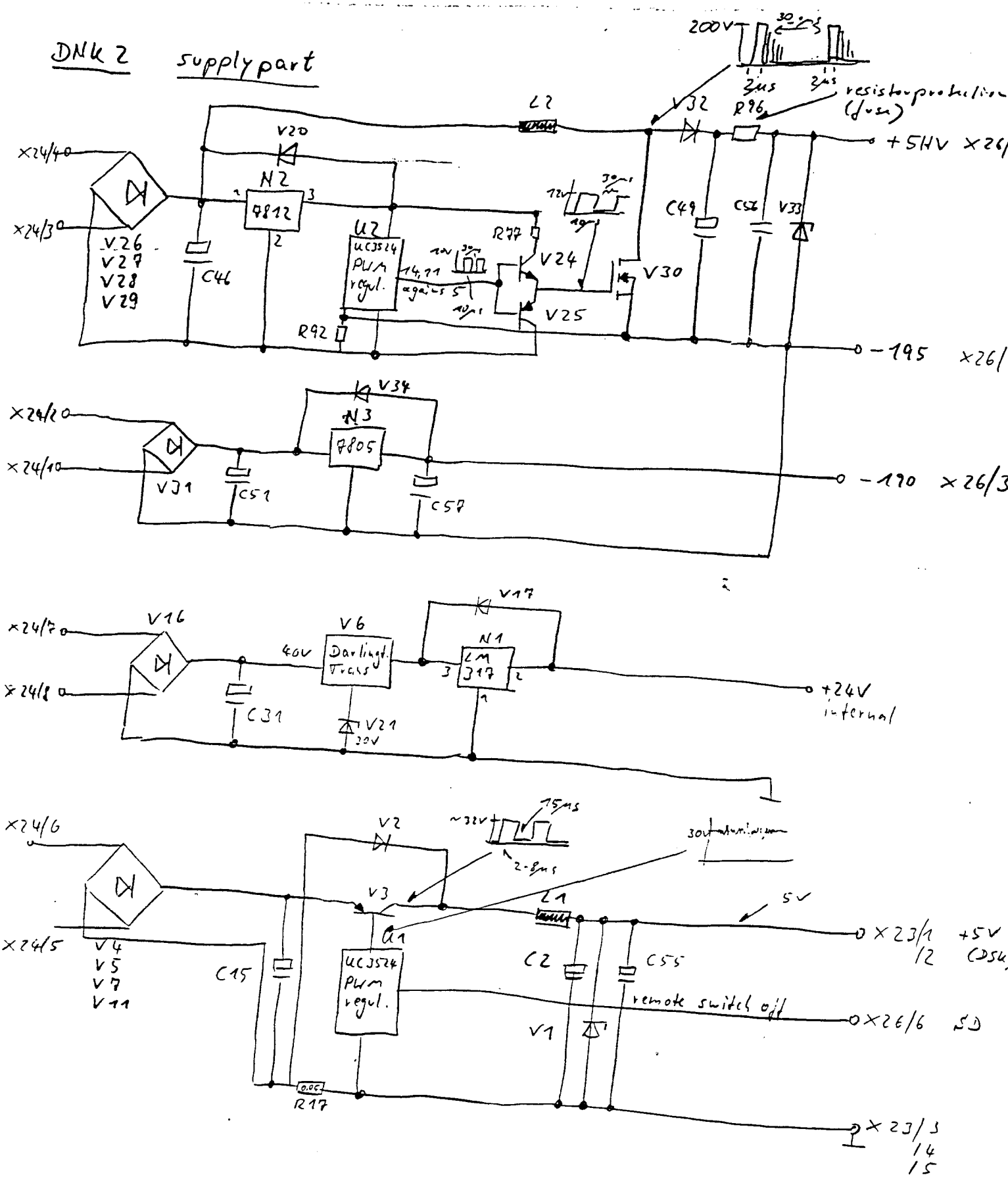


DNK 2
Panasonic Display

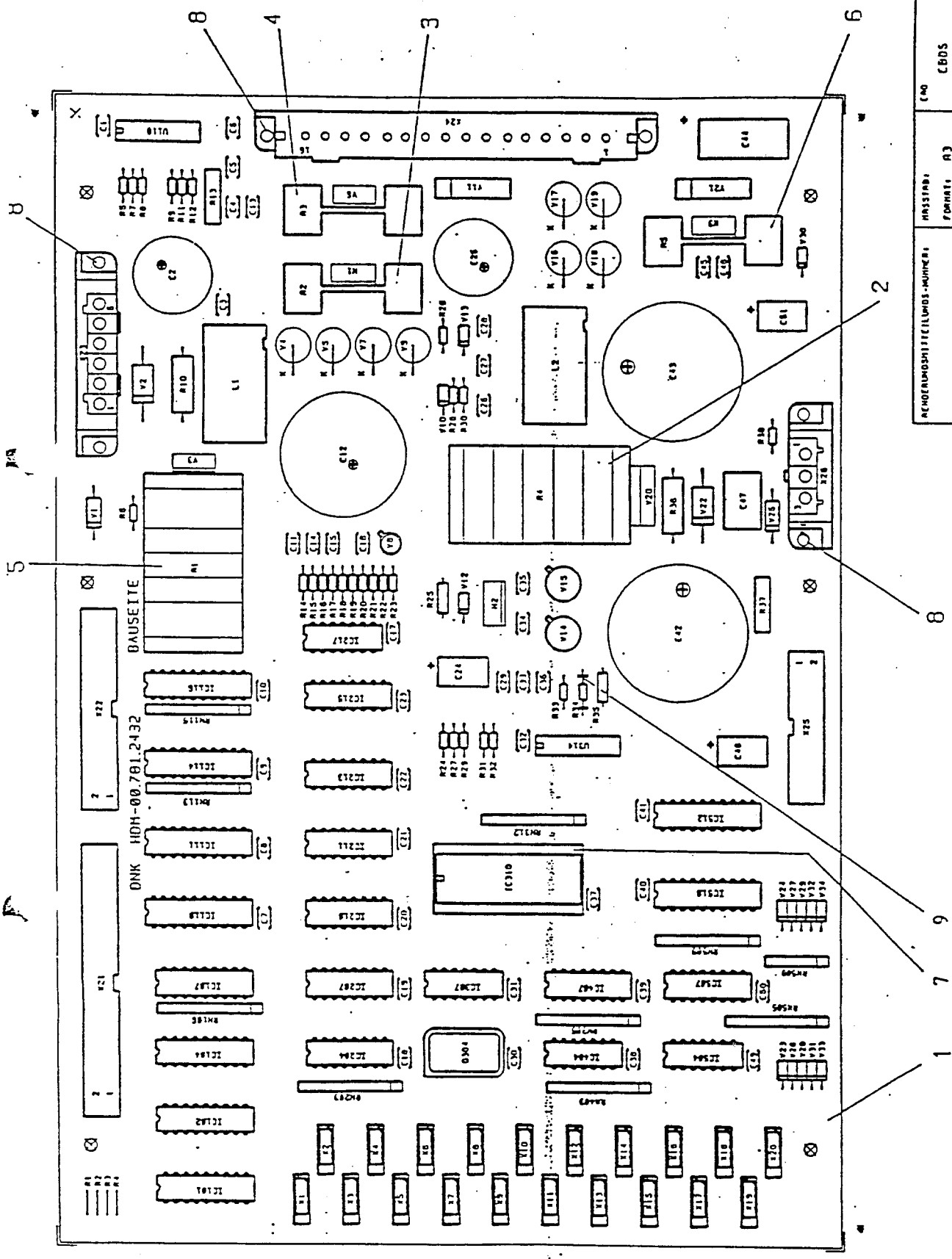


AENDERUNGSMITTEILUNGS-NUMMER 1/63/1318			MASSTAB: 1:1	CBDS 04.02	PROJEKTION
	DATUM	NAME	FORMAT: A3	BIDNK2	
BEARB.	09.11.89	LUX	BENENNUNG DNK2		ERST-ERSTELLUNG: 16.01.89 SPT-MAR
GEPR.	09.11.89	MARSCHNER	DISPLAY-NETZTEIL-K		
NORM			DISPLAY-NETZTEIL-KARTE		
HEIDELBERGER DRUCKMASCHINEN AG			UNTERLAGEN-NR		BLATT-NR. EIN- AUSG

DNK 2 supply part



DNK 1
Oki-Display



MASSTAB:		CAD	CBDS
FORMAT: A3		BENENNUNG	DNK
		DISPLAY-NETZTEIL-KARTE	
		BESTUECKUNGSPLAN	
ZEICHNUNGS-NR.	91.150.0081/A	BLATT 1	1 BL.
ERSATZ FUER:		VORIGER INDEX:	

AENDERUNGSHINWEIS/AENDERUNGS-NUMMER:	DATUM	NAME	SCHERDEL
BEARB.			
GEPR.			
NORM			

MEIDELBERGER DRUCKMASCHINEN AKTIENGESELLSCHAFT

SCHUTZVERMERK DIN 34

Purpose

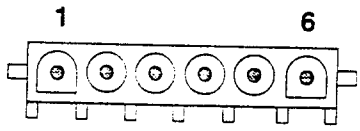
The DNK generates the supply voltages for display control board DSK and the central information display ZID.
Apart from this it adapts the picture data from the display controller board DSK and transfers the picture data to the central information display.

Task/function

The display control board DSK consists of the basic display board DGP and the EPROM module EPM.
The processor of the display control board analyzes the data serially transmitted by the connected processor board (BEK/REK/ZSK). With this data and the data from the EPROM module EPM, the image to be displayed is built up in the graphics section of the display control board and stored temporarily.
Via a parallel interface the data is transmitted to the display power supply board. The processor on the DSK processes the signals and also makes them available to the graphics section for image build–up.
Apart from the inputs made via the numeric keypad, the software version of the EPROM module EPM is transmitted to the connected processor board (BEK/REK/ZSK).
When the press has been switched on, the display control board carries out a self–test (display dark). After this self–test the DSK activates the ZID via the DNK.

Pin assignment

X4

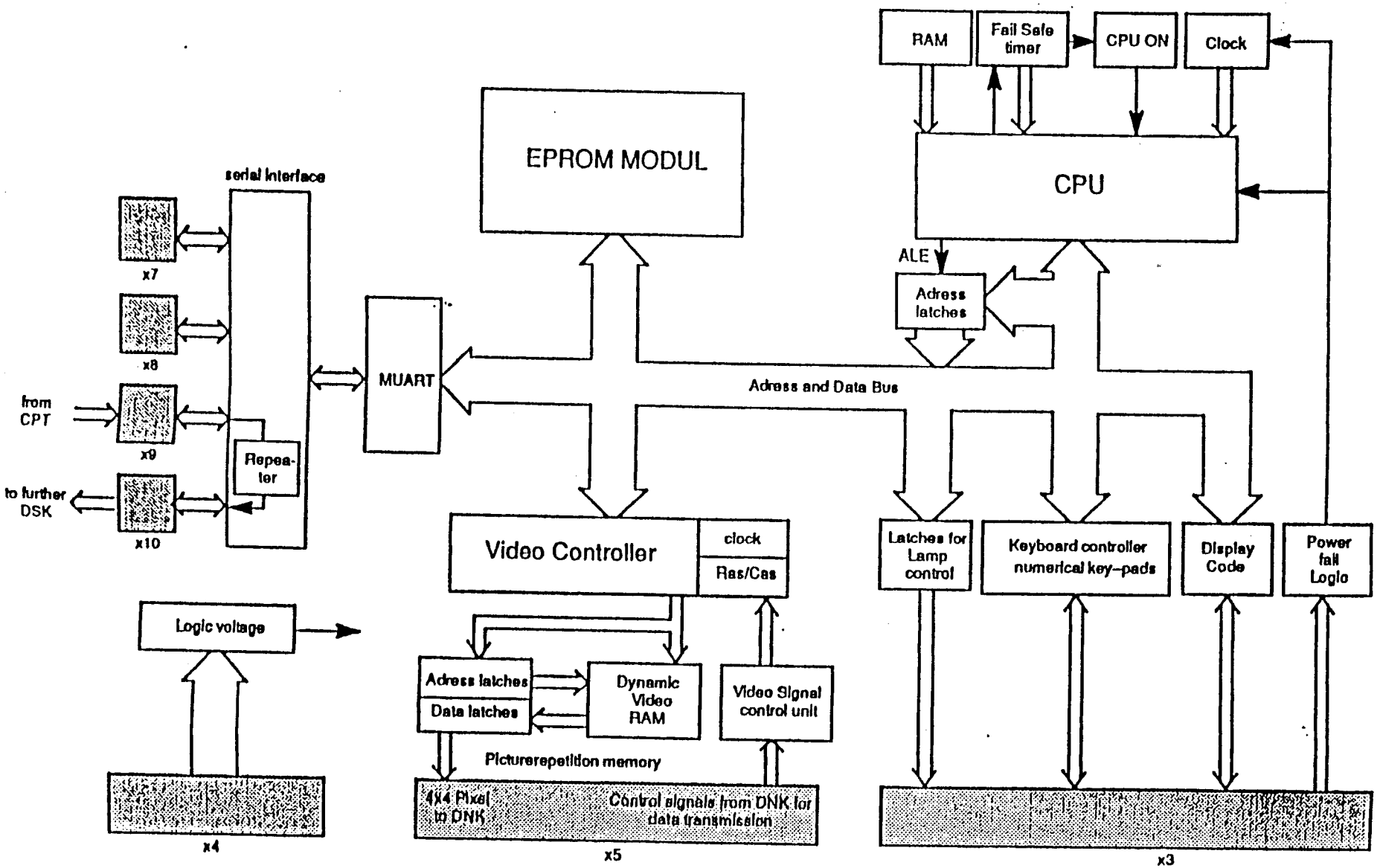


Pin base X4

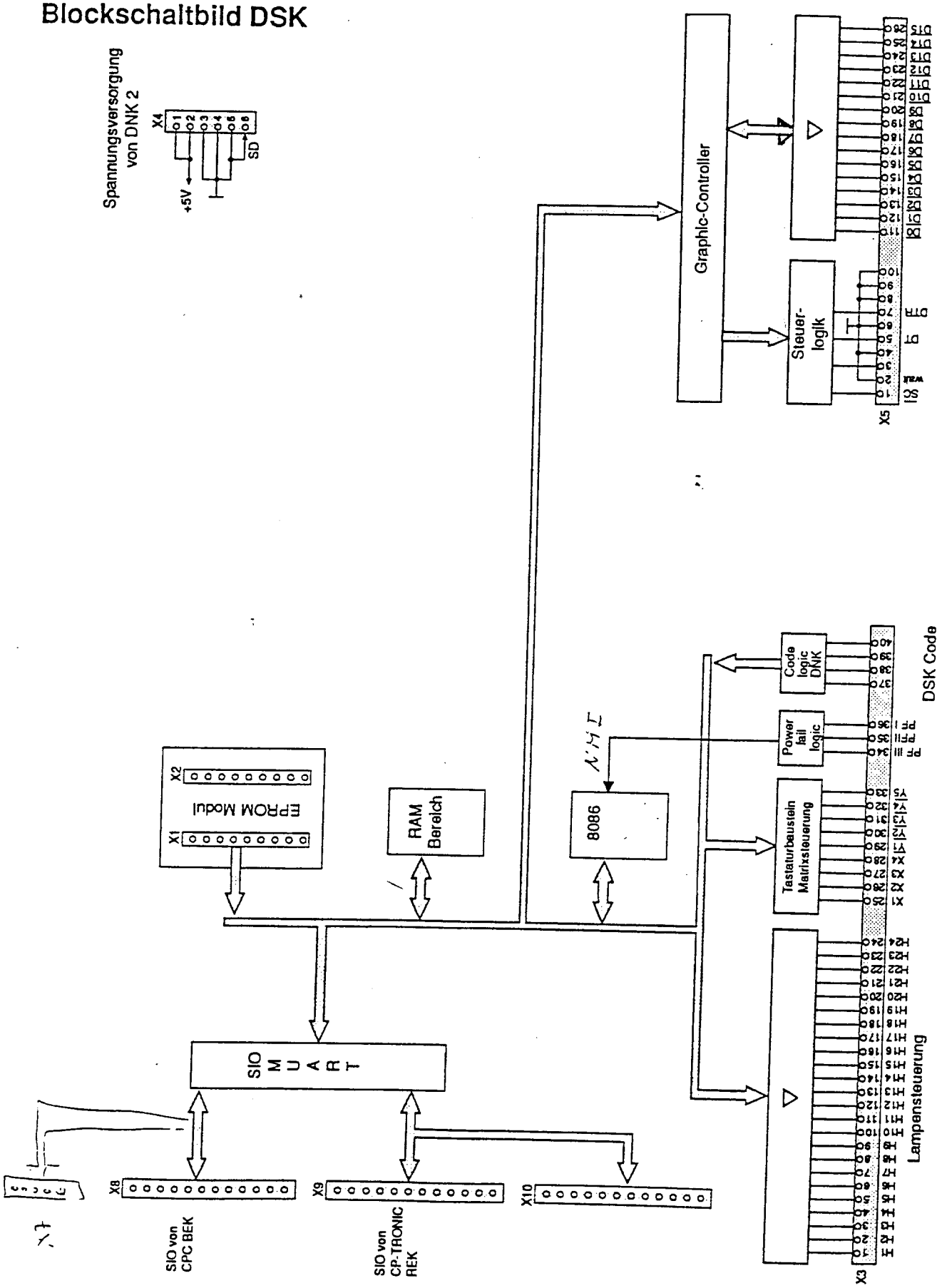
X4 Pin base / voltage supply

Pin	Function[1]	Function[2]
1	5V DC[3]	0.4V DC[3]
2	5V DC	5V DC
3	⊥ 5V	⊥ 5V
4	⊥ 5V	⊥ 5V
5	⊥ 5V	⊥ 5V
6	Signal SD[3]	Open[3]

[1] Plug inserted
[2] Plug *not* inserted
[3] The signal SD is the signal "Ground" returned by the DNK. 5V DC of the DNK are electronically stepped down, if the plug DNK-X23/DSK-X4 is not inserted.

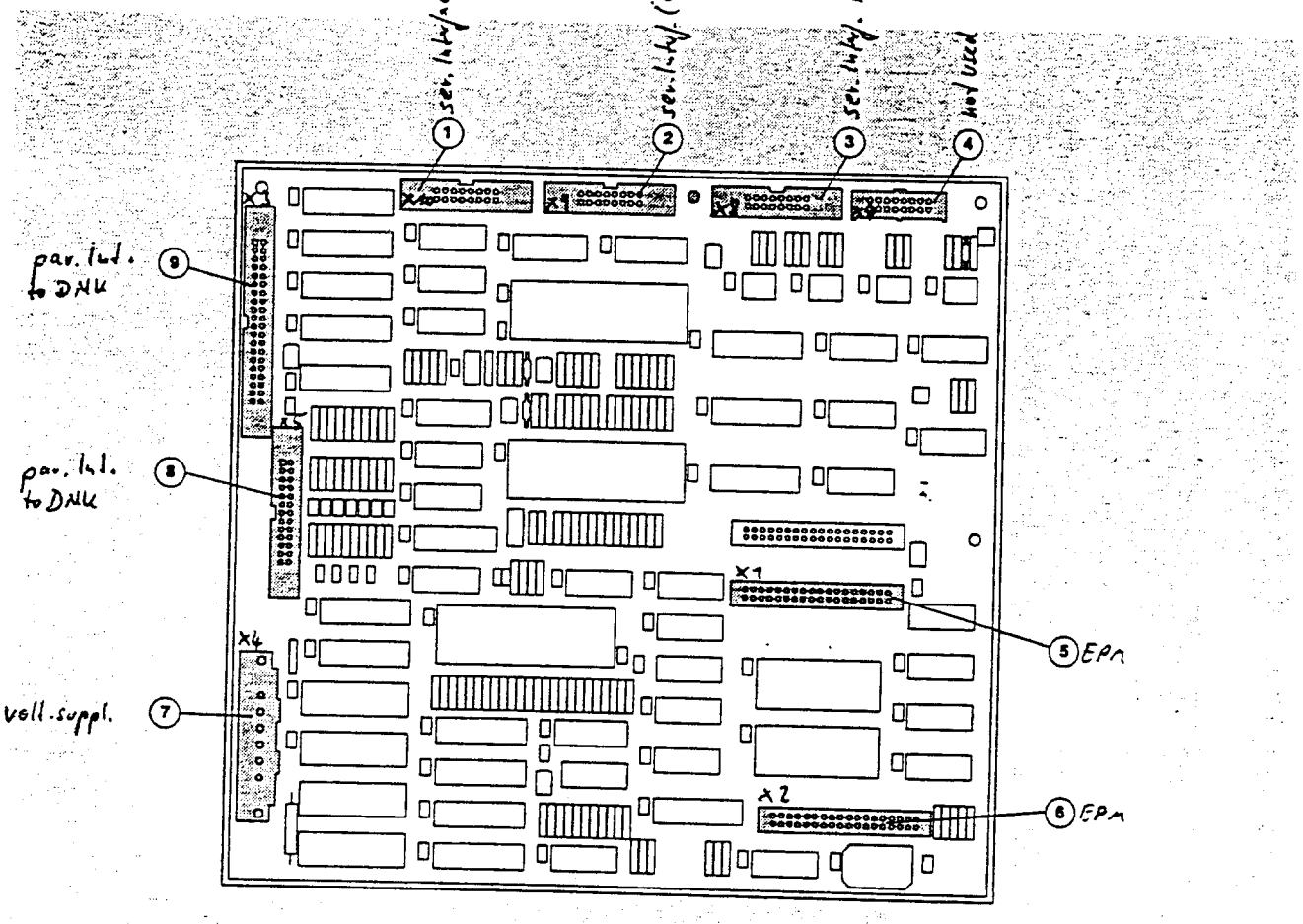

RAM
Fail Safe timer
CPU ON
Clock
EPROM MODUL
CPU
ALE
Adress latches
serial interface
x7
x8
from CPT
x9
to further DSK
x10
Repea-ter
MUART
Adress and Data Bus
Video Controller
clock
Ras/Cas
Latches for Lamp control
Keyboard controller numerical key-pads
Display Code
Power fail Logic
Logic voltage
Adress latches
Data latches
Dynamic Video RAM
Video Signal control unit
Picturerepetition memory
4X4 Pixel to DNK
Control signals from DNK for data transmission
x4
x5
x3

Blockschaltbild DSK



DSK Display control board

Layout



Display control board DSK

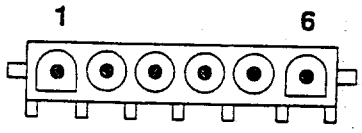
① X10 Pin base serial interface not assigned
② X9 Pin base serial interface not assigned
③ X8 Pin base serial interface (BEK)
④ X7 Pin base not assigned
⑤ X1 Pin base EPROM module EPM
⑥ X2 Pin base EPROM module EPM
⑦ X4 Pin base voltage supply DSK
⑧ X5 Pin base parallel interface (DNK)
⑨ X3 Pin base parallel interface (DNK)

Purpose/function

The display control board DSK is composed of the basic display board DGP and the EPROM module EPM.
The display control board's computer evaluates the serially transferred data on the connected computer board (BEK/REK/ZSK). From these data and the data from the EPROM module EPM the picture to be displayed is built up in the graphics part of the display control board and stored provisionally in memory.
Data transfer is effected via a parallel interface to the display power supply unit board. The computer on DSK processes these signals and also makes them available to the graphics section for picture build-up.
Besides the inputs via the numeric keypad the software version of the EPROM module EPM is also transferred to the connected computer board (BEK/REK/ZSK).
After the printing press has been switched on the display control board performs a self-test (display dark). After completion of the self-test the DSK drives the ZID via DNK and display HEIDELBER, after completed INIT-Test it shows a display regarding its seriel transmitted data.

Plug assignment

X4



Pin base X4

X4 Pin base voltage supply

Pin	Function[1]	Function[2]
1	5V DC[3]	0.4V DC[3]
2	5V DC	5V DC
3	⊥ 5V	⊥ 5V
4	⊥ 5V	⊥ 5V
5	⊥ 5V	⊥ 5V
6	Signal SD[3]	open[3]

[1] Plug inserted
[2] Plug *not* inserted
[3] Signal SD is the back-looped signal DNK "earth". 5V DC of the DNK are reduced electronically, if plug DNK-X23/DSK-X4 is not inserted.

Pin assignments of the DSK(DGP) and DNK

RSC-Bangkok/Futterlieb

DSK(DGP)/X5 = DNK/X22 DSK(DGP)/X3 = DNK/X21

X5	Signal	Description	X3				
1	/SC	Serial clock (shift clock) read serial 16Bit from the register	H1		33	Y5	
2	GND	Ground	H2		34	PF3	for 200V when lower than 150VDC
3	/WAIT	Wait command for IC 7220A	H3		35	PF1	for 5V(DNK)when supply voltage lower 16 VAG
4	GND		H4		36	PF2	for5V(DNK)when5V lower4,5VDC
5	/DT	Data transfer for 4096 bit	H5		37	DC1	display code for
6	GND		H6		38	DC2	sheet fed machine onDNKto ground
7	DTR	Data transfer reset (reset of Eprom adress)	H7		39	DC3	connected
8	GND		H8		40	DC4	
9	NC	Not connected	H9				
10	GND		H10		X4		
11	/DO	An address -generator on the DNK produces	H11		1	+5V	
12	/D1	contineously addresses for the DNK eprom.	H12	lamp out	2	+5V	
13	/D2	Therefore the data bus of the Eprom provides on its databus on :	H13	puts for the Key-	3		
14	/D3	DO=VS vertikal syncron signal D1=HS horizontal syncron signal	H14	board materia	4		
15	/D4	D2=SC serial clock (shift clock) D3=wait command for IC 7220A	H15	(Key pad0	5		
16	/D5	D5=DT data transfer of 4096 bits D6=DTR data transfer reset	H16	only used in CPT			
17	/D6	D4=lock shift clock D7=reset address counter	H17	with out EAM			
18	/D7	These control signals (D0 to D7) request the 16 bit pixel information	H18	up to software			
19	/D8	from the DSK, provided on D0 to D15 of plug DSK/X5	H19	10.20			
20	/D9		H20	low OV high 5V			
21	/D10	16 000 x 16 bit= 256 000 pixel	H21	out put dirver			
22	/D11	= 400 lines x 640 rows of the display	H22	for 24V on DNK			
23	/D12	Each 16 bit data word is then splitted	H23	(24 lamp outputs)			
24	/D13	into 4bit blocks (nippels) and trans	H24				
25	/D14	fered to the ZID. The ZID receives	X1				
26	/D15	also HS, VS, SC and ENA.	X2				
27			X3	scanlines keyboard			
28			X4	matrix pushbutton's			
29			Y1	20 push button's			
30			Y2	return lines			
31			Y3	keyboard atrix push			
32			Y4	button's			

DSK (DGP) X3 = DNK X21

RSC Bangkok / Futterlieb

Pin	Name	Signal	Description
1	H01	lamp output	Pin 1 - 24 carry lamp output data (low = 0V / high = 5V) for the key board matrix (numeric keypad lamps). The output driver IC's are located on the DNK. They amplify the current and convert 5VDC to a 24VDC The lamp outputs are only in use in CPtronic modular applications up to software level 10.2 inclusively. Software 11.x requires an EAM. The numeric keypad is then connected to the EAM instead of being connected to the DNK. Only the delete push button is equipped with a lamp.
2	H02	lamp output	
3	H03	lamp output	
4	H04	lamp output	
5	H05	lamp output	
6	H06	lamp output	
7	H07	lamp output	
8	H08	lamp output	
9	H09	lamp output	
10	H10	lamp output	
11	H11	lamp output	
12	H12	lamp output	
13	H13	lamp output	
14	H14	lamp output	
15	H15	lamp output	
16	H16	lamp output	
17	H17	lamp output	
18	H18	lamp output	
19	H19	lamp output	
20	H20	lamp output	
21	H21	lamp output	
22	H22	lamp output	
23	H23	lamp output	
24	H24	lamp output	
25	X1	scanline	Pin 25 - 28 carry the scanline signals of the keyboard matrix pushbuttons. The design was up to 20 push-buttons, even only 11 are used for the numeric keypad.
26	X2	scanline	
27	X3	scanline	
28	X4	scanline	
29	Y1	returnline	Pin 29 - 33 carry the returnline signals of the keyboard matrix pushbuttons.
30	Y2	returnline	
31	Y3	returnline	
32	Y4	returnline	
33	Y5	returnline	
34	PF3	power fail 200V	high active, for 200V if lower then 150VDC
35	PF1	power fail 5V	high active, for 5V(DNK) if supply v. low. then 16VAC
36	PF2	power fail 5V	high active, for 5V(DNK) if lower then 4.6VDC
37	DC1	display code	ground For all sheet fed application Pin 37 - 40 are
38	DC2	display code	ground connected to ground. The coding is only used in
39	DC3	display code	ground WEB presses.
40	DC4	display code	ground

DGP (DSK) / DNK

DSK X5 = DNK X22 DSK X3 ≙ DNK X21 X3

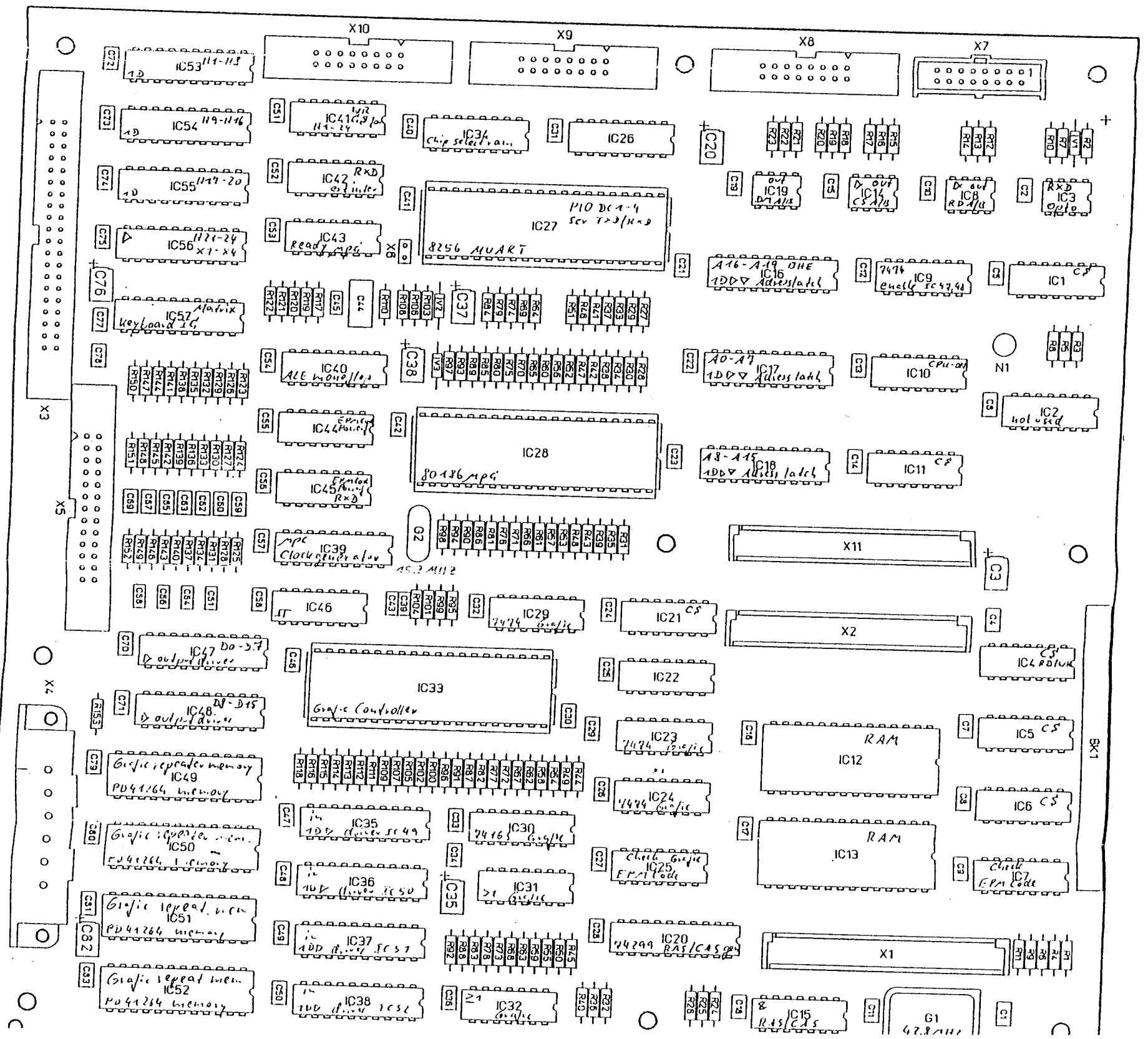
1	$\overline{SG}$	serial Clock (Shift Clock) read serial 16 Bit of Regist.	H1		33	AV5	)	
2	⊥		H2		34	PF3	for 200V when lower than 150VDC	L active
3	$\overline{WAIT}$	wait command for 7220A	H3		35	PF1	for 5V (DNK) when supply voltage lower 16 [illegible]	L active
4	⊥		H4		36	PF2	for 5V (DNK) when 5V lower 4,6 VDC	L active
5	$\overline{DT}$	Data transfer for 4096 Bit	H5		37	DC1	display code bit	⊥
6	⊥		H6		38	DC2	stacked machine on DNK to ground	⊥
7	$\overline{DTR}$	Data transfer reset (reset of DTR adresse)	H7		39	DC3	connected	⊥
8	⊥		H8		40	DC4		⊥
9			H9					
10	⊥		H10		X4			
11	$\overline{D0}$	An adress generator on the DNK count	H11		1	+5V		
12	$\overline{D1}$	continiously all adresses of the DNK Eprom.	H12	lamp out-	2	+5V		
13	$\overline{D2}$	The Data bus of the Eprom provide on	H13	puts for the key-	3	⊥		
14	$\overline{D3}$	D0 VS vertikal sync. D1 HS horizontal syn.	H14	board matrix	4	⊥		
15	$\overline{D4}$	D2 SG serial clock D3 WAIT	H15	(key pad)	5	⊥		
16	$\overline{D5}$	D5 DT D6 DTR	H16	only used in CPT	6	⊥		
17	$\overline{D6}$	D4 lock SG D7 reset adress	H17	without EAM				
18	$\overline{D7}$	counter these Control -	H18	up to software				
19	$\overline{D8}$	signals request	H19	10.2.				
20	$\overline{D9}$	the 16 bit pixel	H20	low 0V high 5V				
21	$\overline{D10}$	16 000 x 16 bit =	H21	outputdriver				
22	$\overline{D11}$	256 000 pixel =	H22	for 24V on DNK				
23	$\overline{D12}$	400 x 640 Display	H23	(24 lamp outputs)				
24	$\overline{D13}$	it into 4 bit blocks	H24	)				
25	$\overline{D14}$	for it to the	X1					
26	$\overline{D15}$		X2					
27			X3	Scanlines keyboard matrix				
28			X4	push button's				
29			Y1	20 push button's				
30			Y2	return lines				
31			Y3	key board matrix push button's				
32			Y4					

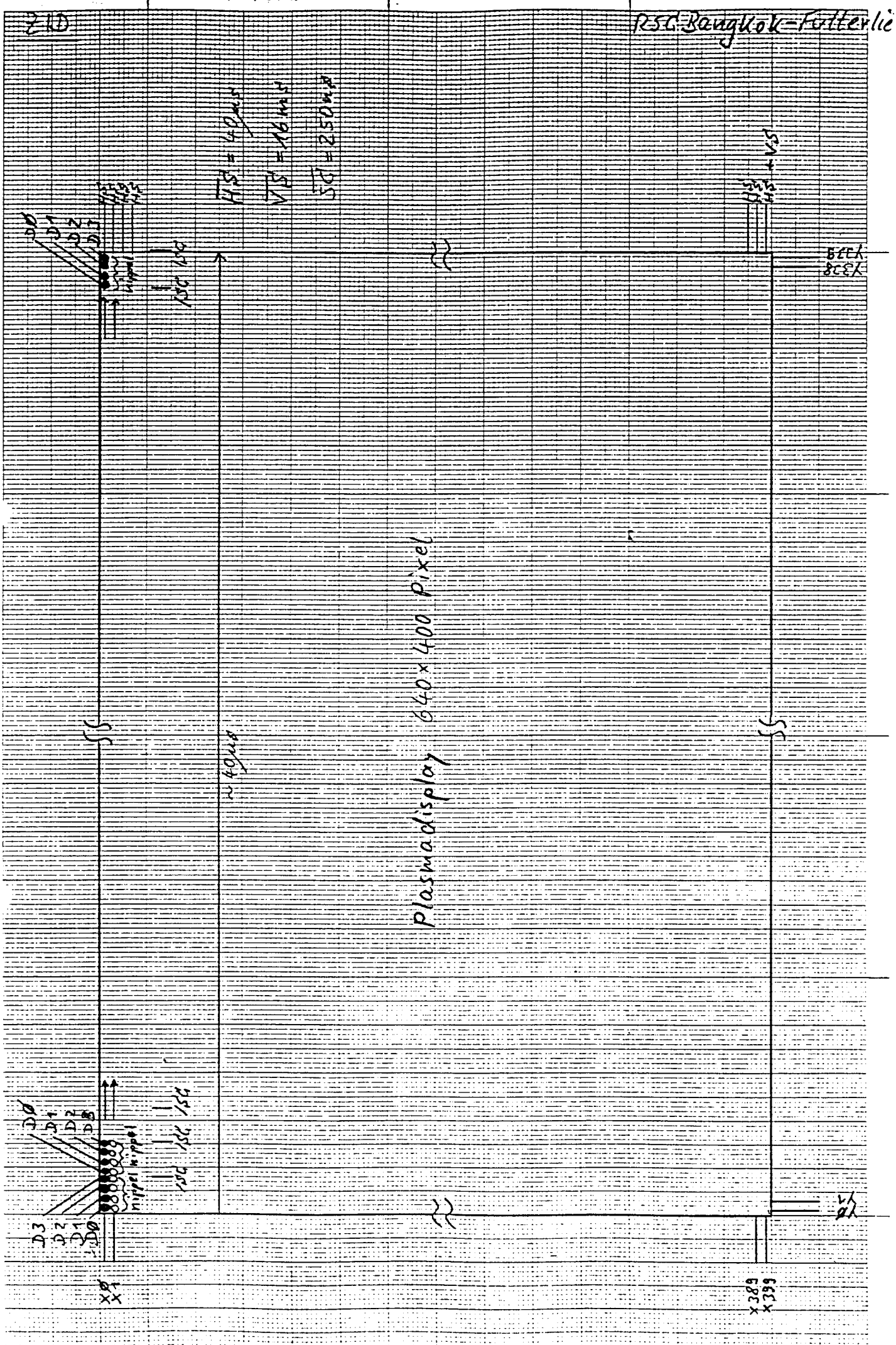
VS

HS

DGP (DSL)

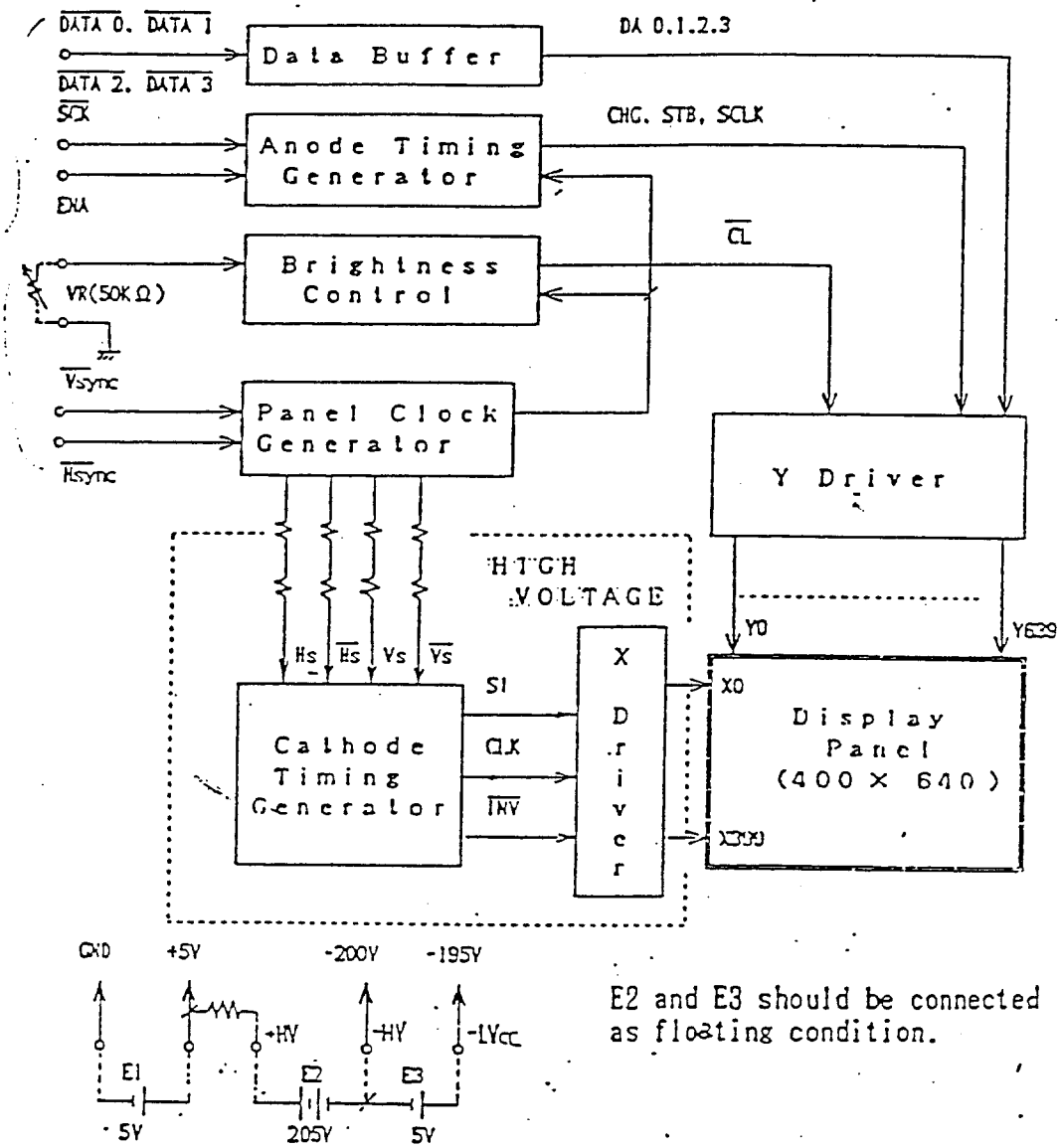
SVM	X7	1 RDA-SVM
		2 RDB-SVM
		11 RSA
		12 RSB
		13 SDA
		14 SDB
		15 MZGA
		16 MZGB
CPC/ 422	X10	3 SDA
		4 SDB
		7 RDB
		8 RDA
		9 GSA
		10 GSB
		11 RSA
		12 RSB
		13 TRA
		14 TRB
		15 DMA
		16 DMB
CPT in/422	X8	3 RDA
		4 RDB
		7 SDB
		8 SDA
		9 RSA
		10 RSB
		11 CSA
		12 CSB
		13 DMA
		14 DMB
		15 TRA
		16 TRB
CPT out/422	X9	3 RDA-OUT
		4 RDB-OUT
		7 SDB
		8 SDA
		9 RSA
		10 RSB
		11 CSA-OUT
		12 CSB-OUT
		13 DMA-OUT
		14 DMB-OUT
		15 TRA
		16 TRB


X10
X9
X8
X7
IC53 111-113
IC54 114-116
IC55 117-120
IC56 121-124
IC57 Keyboard IC
IC41 GDP
IC42 RXD
IC43 Ready MPC
IC34 Chip select
IC26
IC27 PIO DC1-4 SCC TXD/RXD 8256 MUART
IC19 DATA
IC14 CS
IC8 RD/WR
IC3 opto
IC16 A16-A19 OHE
IC9 74174
IC1
IC40 ALE WDOG
IC44 Error
IC45 Error RXD
IC28 80186 MPC
IC18 A8-A15
IC11
IC10 CPU-ON
IC2 not used
IC39 Clockgenerator
IC46
IC29 74174
IC21 CS
IC47 D0-D7
IC48 D8-D15
IC33 Graf.c Controller
IC22
IC23 74174
IC49 PD41464 memory
IC50 PD41464 memory
IC51 PD41264 memory
IC52 PD41264 memory
IC35
IC36
IC37 ADD
IC38
IC30 74163
IC31
IC32
IC24 74174
IC25 Char. Graf. EPM code
IC20 74299 RAS/CAS
IC12 RAM
IC13 RAM
IC5 CS
IC6 CS
IC7 Char. EPM code
IC15 RAS/CAS
X11
X2
X1
X3
X4
X5
X6
BK1
N1
G1 42.8 MHz
G2 16.2 MHz


Plasmadisplay
640 x 400 Pixel
RSC-Baugruppe-Folterliebe

PLASMA DISPLAY UNIT SPECIFICATION MD400F640PD1A

6. BLOCK DIAGRAM



E2 and E3 should be connected as floating condition.

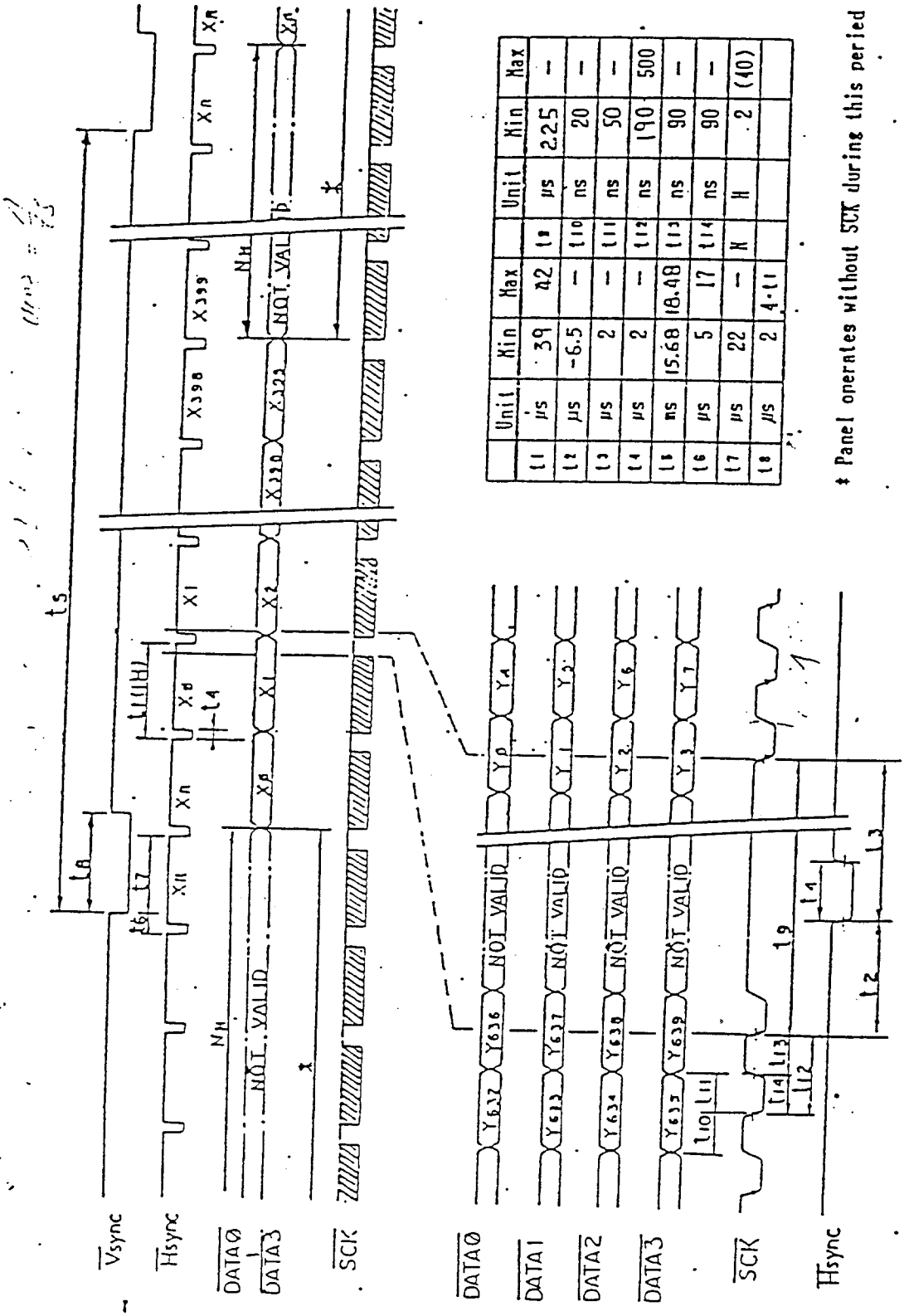
ENA = enable anode

ENA	L	No Display
	H	Normal Operation

Brightness Control

Fixed	J3 is open (Brightness - 100 %)
Variable	Variable resistor (50 kΩ)

9.TIMING CHART (1R Mode · JP2 ②—③ short)

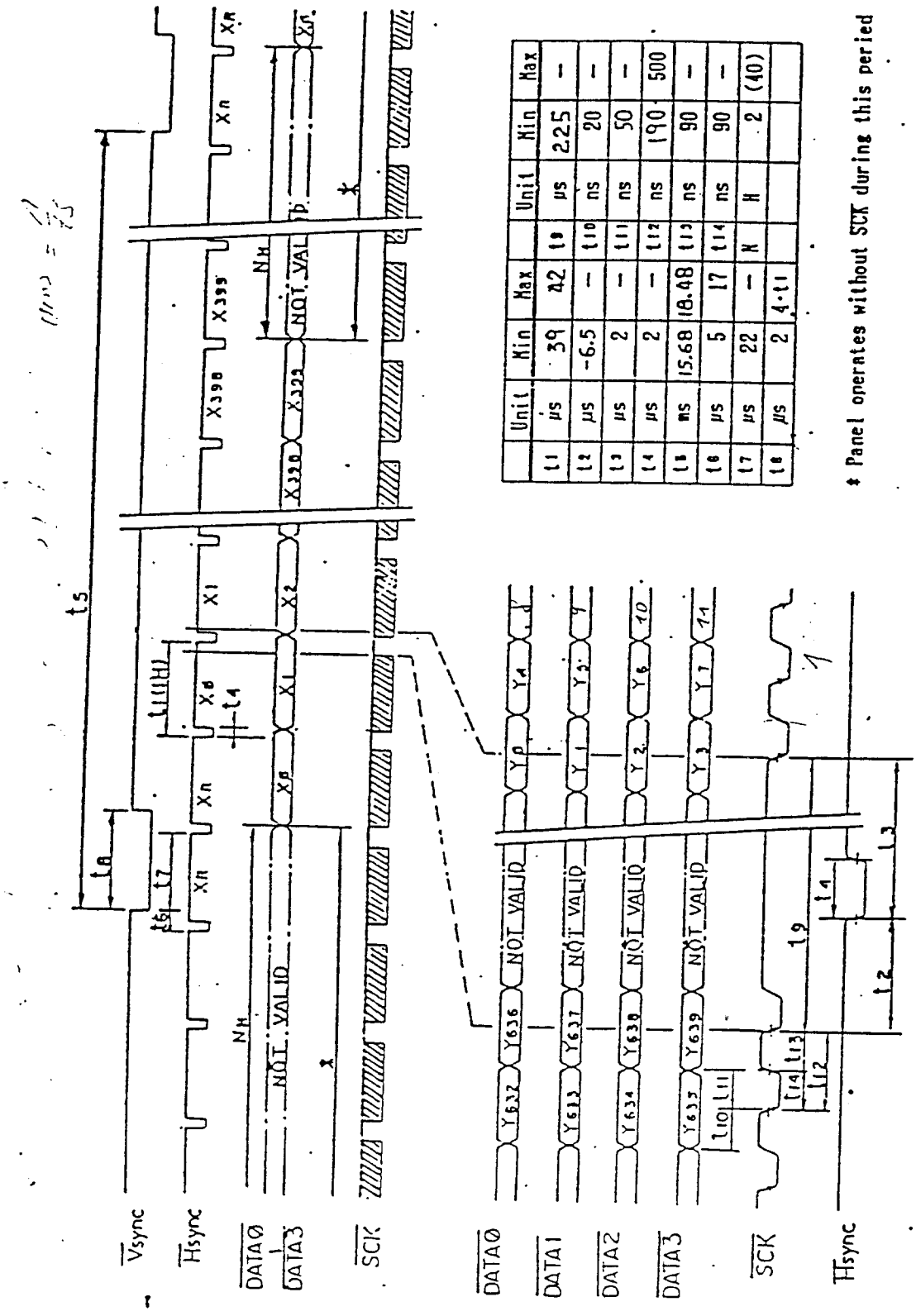


	Unit	Min	Max		Unit	Min	Max
t1	μs	39	42	t8	μs	225	—
t2	μs	-6.5	—	t10	ns	20	—
t3	μs	2	—	t11	ns	50	—
t4	μs	2	—	t12	ns	190	500
t5	ns	15.68	18.48	t13	ns	90	—
t6	μs	5	17	t14	ns	90	—
t7	μs	22	—	N	H	2	(40)
t8	μs	2	4.11				

* Panel operates without SCK during this period

Date					Signature	Page
						8 of 8

9.TIMING CHART (1R Mode · JP2 ②—③ short)



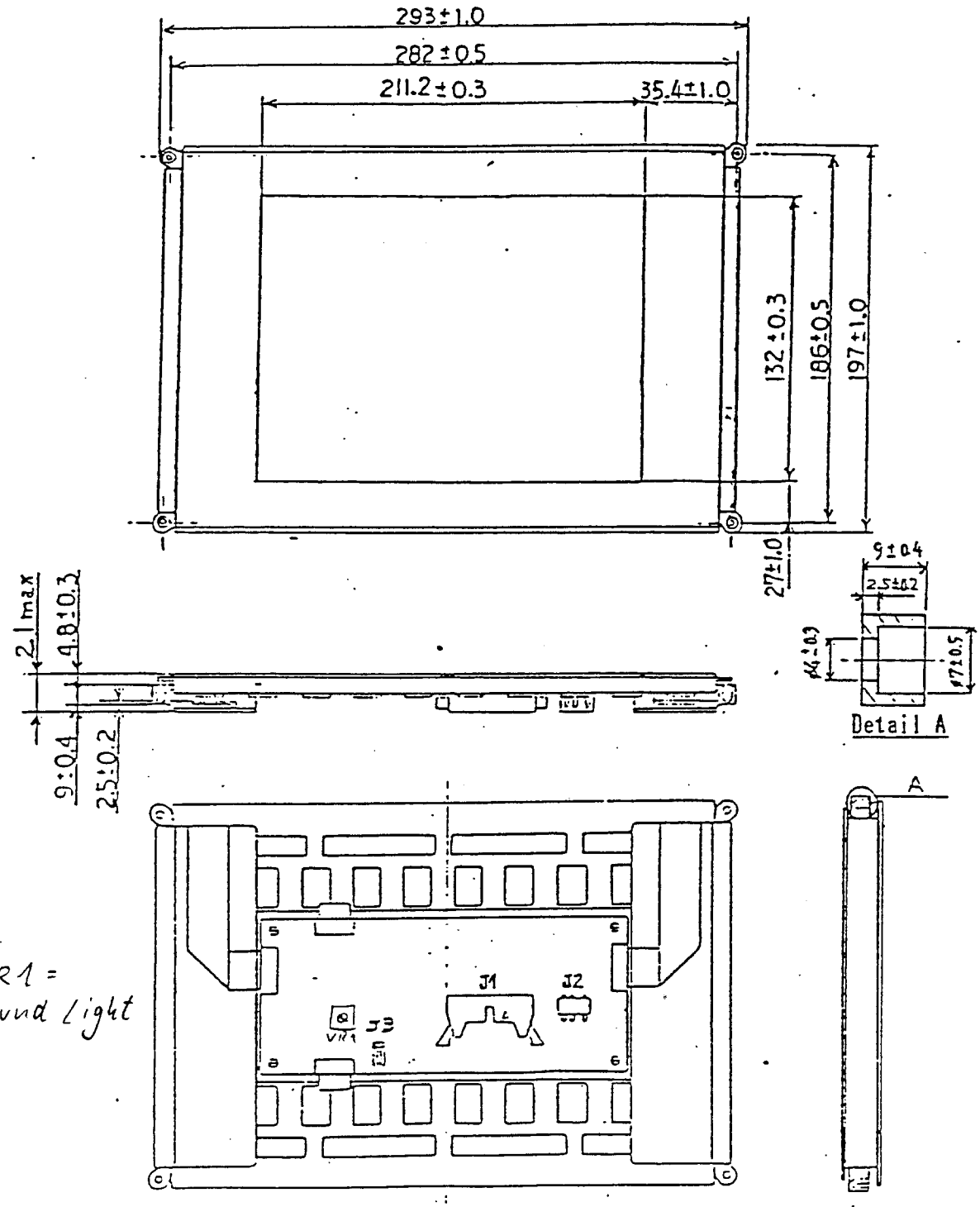
	Unit	Min	Max
t1	µs	39	42
t2	µs	-6.5	—
t3	µs	2	—
t4	µs	2	—
t5	ns	15.68	18.48
t6	µs	5	17
t7	µs	22	—
t8	µs	2	4-t1

	Unit	Min	Max
t9	µs	225	—
t10	ns	20	—
t11	ns	50	—
t12	ns	190	500
t13	ns	90	—
t14	ns	90	—
N	H	2	(40)

* Panel onerates without SCK during this period

7. OUTLINE DIMENSIONS

(Unit : mm)



Poti VR1 = Background Light

Date	~~Aug. 21, '87~~	~~Jan. 29, '88~~	Jan. 29, '88		Signature	Page
						6 of 8

4.POWER REQUIRMENT

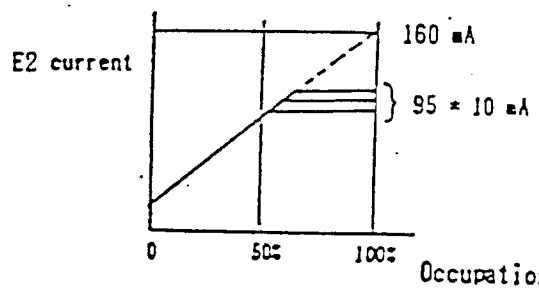
SYMBOL	OPERATING VOLTAGE	RIPPLE TOLERANCE	Max. CURRENT
E 1	5 V ± 0.5 V	100 mVp-p	0.6 A
E 2	205 V ± 5 V	200 mVp-p	160 mA
E 3	5 V ± 0.5 V	100 mVp-p	60 mA

Total Power Consumption ····· 35 W (max.)
Power Sequence ····· Power can be turned on/off in any order.

Note (1) E1 current capacity should be applied less than 4 A to avoid excessive current by short circuit trouble.

(2) E2 voltage ripple should be kept less than 200 mVp-p to avoid flicker of auxiliary.

(3) ABL activates at E2 current of 95 mA ± 10 mA (Ta - 25 ℃)



To disactivate ABL,connect plus ends of E1 and E2 externally.

5.ENVIRONMENTAL RATINGS

ITEMS	OPERATING	NON-OPERATING
Ambient Temperature	- 5 ℃ ~ + 55 ℃	- 20 ℃ ~ + 75 ℃

PLASMA DISPLAY UNIT SPECIFICATION MD400F640PD1A

8.PIN CONNECTION

ZID-J1 ≅ DNK-X25

HIF3BA-16PA-2.54DS (HIROSE)

orange dots	1	$\overline{\text{Vsync}}$	2	GND	
orange dots	3	$\overline{\text{Hsync}}$	4	GND	
black lines	5	$\overline{\text{DATA 0}}$	6	$\overline{\text{DATA 1}}$	black lines
black lines	7	$\overline{\text{DATA 2}}$	8	$\overline{\text{DATA 3}}$	black lines
	9	GND	10	GND	
orange lines	11	$\overline{\text{SCK}}$	12	GND	
	13	+5V	14	+5V	
	15	GND	16	ENA	orange dots

Mating Connector

HIF3A-16D-2.54R (HIROSE)

J2

640389-4 (AMP)

1	+HV	5VDC
2	-HV	205VDC
3	-LV cc	5VDC

Mating Connector

640250-4 (AMP)

J3

008263021100000 (ELCO)

1	Brightness
2	Volume

Mating Connector

608263302815 (ELCO)

Jumper setting

Jumper	①—② short	②—③ short	pre-set
JP1 (no influence)	With brightness control volume	Without brightness control volume	②—③ short
JP2 (JP2 off starts flickering than off)	16H mode (vertical size increases)	1H mode (normal size)	②—③ short

Heidelberger

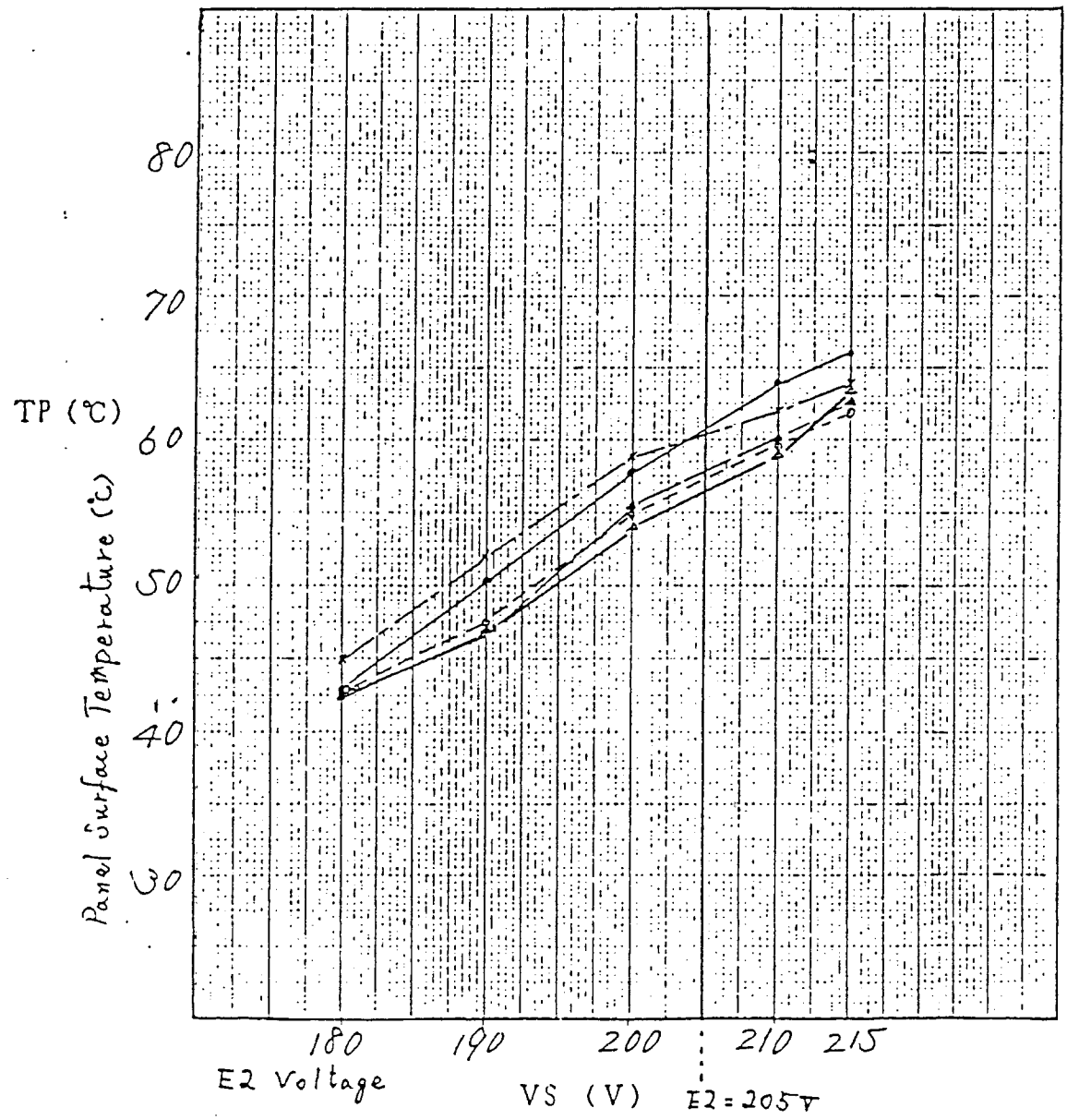
1/13/89

パネル面温度

ABL Off

パネル NO.	/	VS	180 (V)	190 (V)	200 (V)	210 (V)	215 (V
① ② ③ ④ ⑤ Ta 25℃ 全点灯	測定点	①	43.2	50.5	58.0	63.9	66.1
		②	43.2	47.4	54.9	59.6	62.2
		③	45.2	52.0	58.9	61.8	63.8
		④	42.6	47.2	55.7	60.1	62.5
		⑤	43.3	47.0	54.2	59.1	60.3

- Open atmosphere (Free Convection)
- Ambient Temperature = 25°C
- All Dots ON



日付	62.9.9							全シート		シートNO	11

設計試験

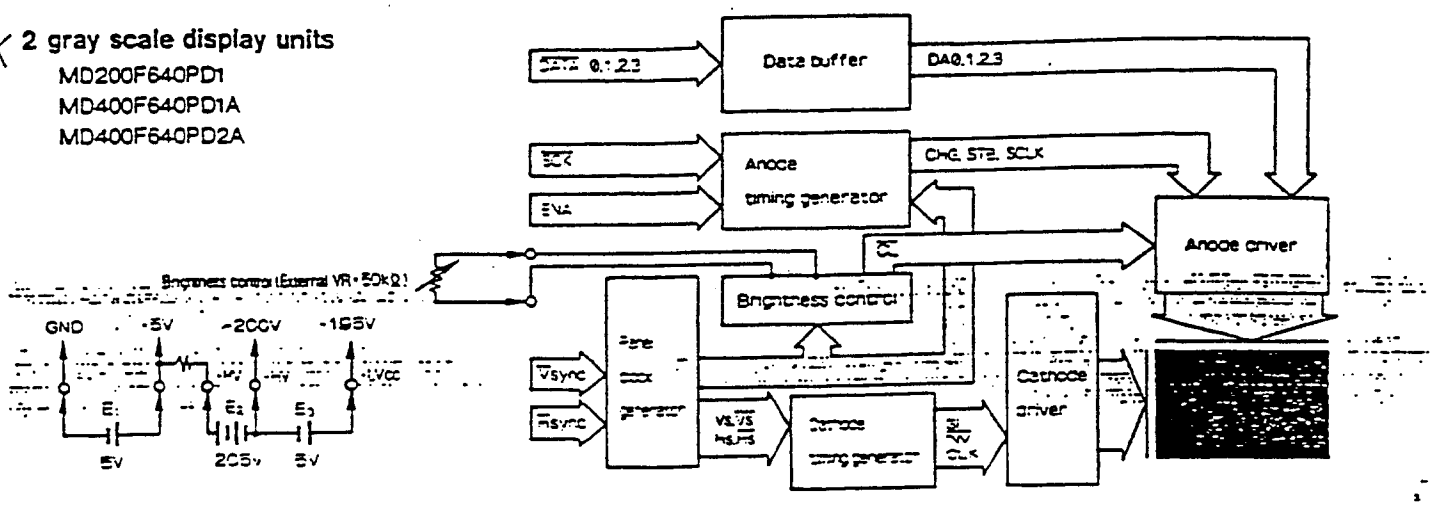
TYPE : MD400F640PD1 [redacted]

松下電子工業株式会社・撮像管事業部

BLOCK DIAGRAM

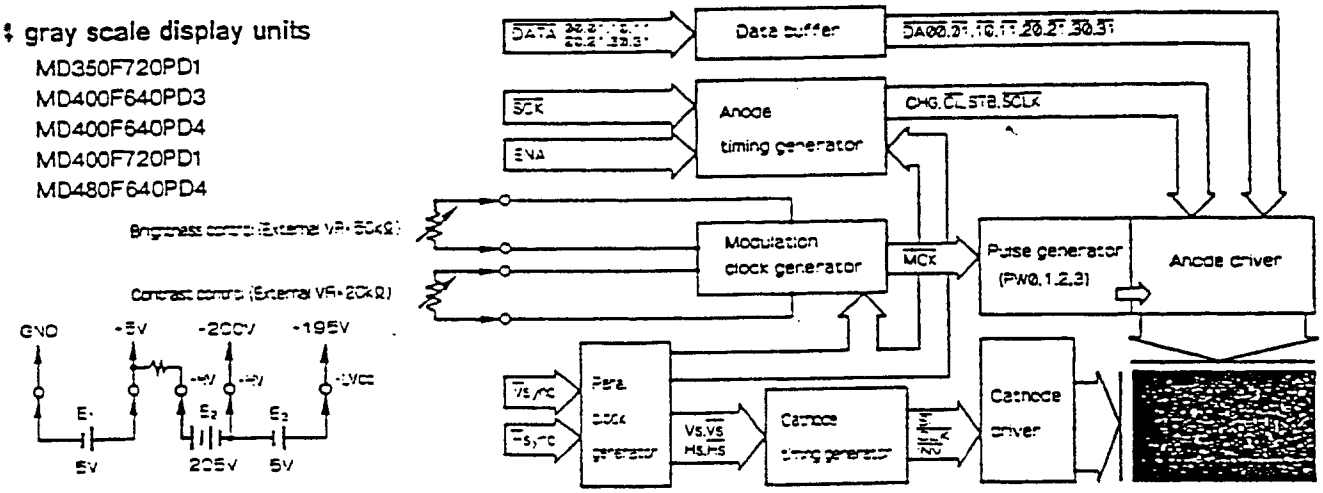
2 gray scale display units

MD200F640PD1
MD400F640PD1A
MD400F640PD2A



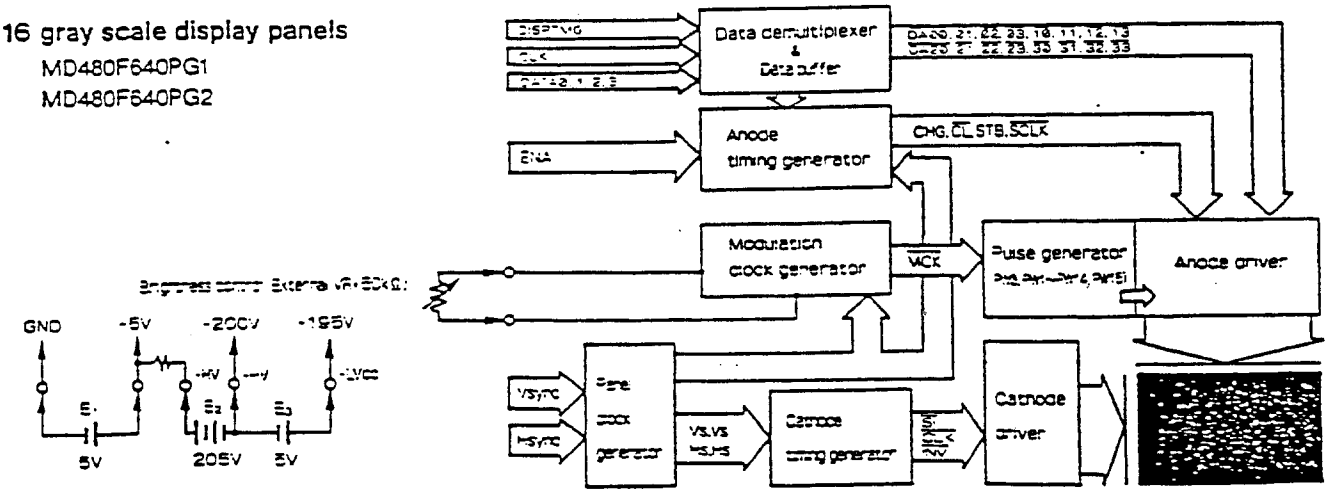
4 gray scale display units

MD350F720PD1
MD400F640PD3
MD400F640PD4
MD400F720PD1
MD480F640PD4



16 gray scale display panels

MD480F640PG1
MD480F640PG2



Specifications are subject to change without notice. For details, refer to the individual specifications.

MATSUSHITA ELECTRONICS CORPORATION
CAMERA TUBE DIVISION
1-1 SAIWAI-CHO TAKATSUKI OSAKA, 569. JAPAN.
TELEX : J63461
PHONE : (0726)82-5521
FAX : (0726)82-7517

PRINTED IN JAPAN

CONSTRUCTION OF DISPLAY UNIT

Plasma Display Unit Consists of Panel, Driver and Interface Blocks.

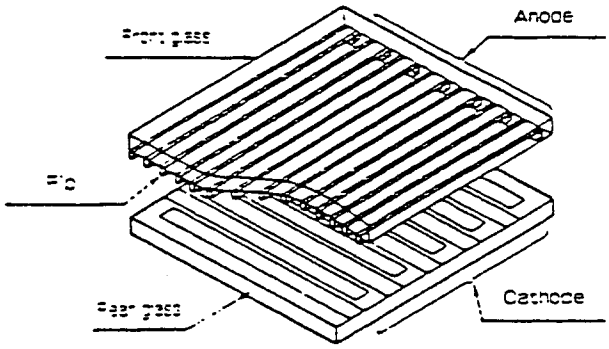
DISPLAY PANEL

Panasonic plasma display panel, utilizing DC technology, offers vivid neon-orange color.

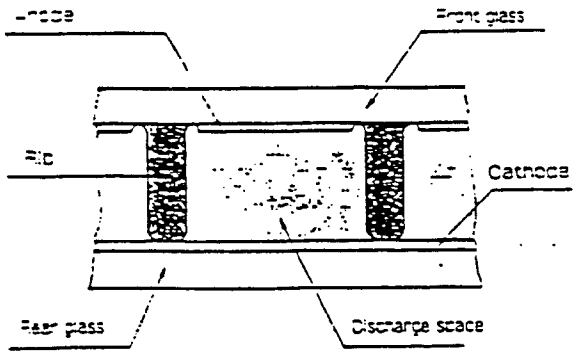
Anode and cathode electrodes located on the inside of front and rear pieces of glass respectively, make matrix structure, and intersection of each electrode corresponds to individual pixel.

Stripes of transparent anode are laid using thick film printing. To ensure stable image over the life, all pixels are scanned and gives auxiliary discharge regardless of the data levels.

For pixel separation in vertical direction, stripes of ribs are printed between anode stripes.



Construction of display panel



Cross section of discharge pixel

DRIVER

Cathode driver scans the cathode lines from top to bottom synchronizing with horizontal sync. signal.

Anode driver controls transferring, latching and switching data for corresponding cathode line.

INTERFACE

Interface board transforms input signals into internal signals which controls cathode and anode driver operation.

The board is designed for easy interfacing with CRT controller.

In addition, driver protection circuit, brightness control and contrast control (not available for some types) are incorporated.

Two gray scale models require vertical sync., horizontal sync., shift clock and 4-bit parallel data as input signals.

In this case, each bit corresponds to one pixel data on a specific cathode line.

For multiple gray scale panels, 2 or more bit are assigned to each pixel data for pulse width brightness modulation.

Low logic level of enable signal erases the entire display while power is "on".

Circuit board is designed and laid out to meet principal safety standards.

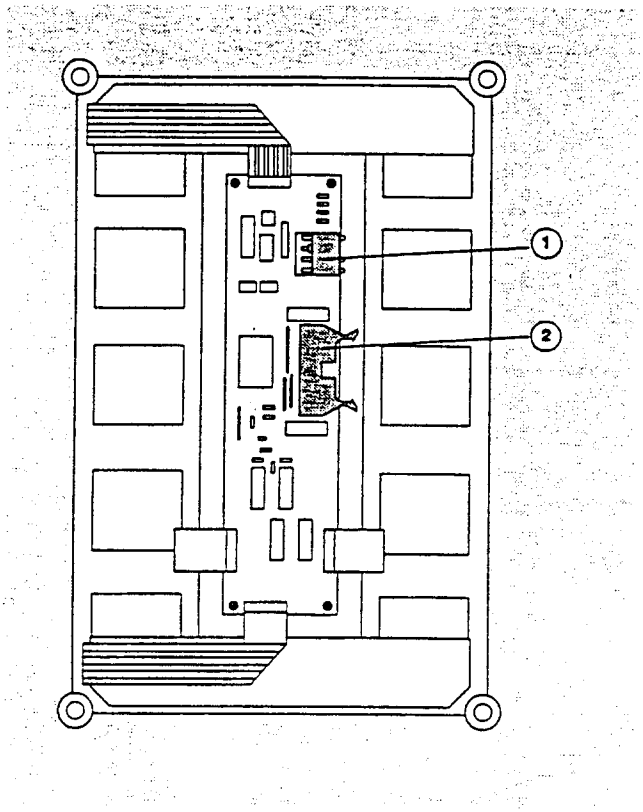
POWER SUPPLY

Three power supply are required for Panasonic plasma display.

They are : −5V (DC) for logic, floating 205V (DC) for panel and floating 5V (DC) for scanning logic.

ZID Central information display

Layout



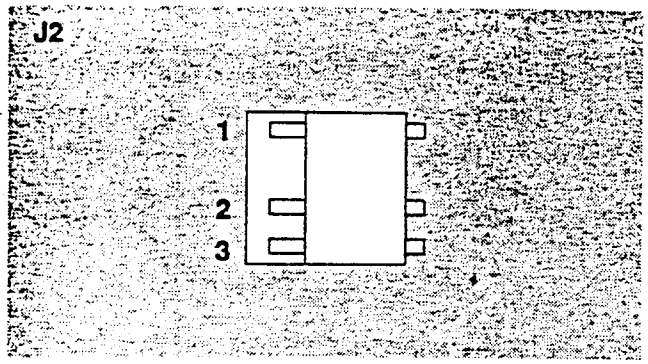
Central information display ZID

① J2 Pin base voltage supply ZID
② J1 Pin base data line (DNK)

Purpose

The purpose of the ZID central information display is to display the operator control, control, and monitoring functions on a printing press.
The ZID is a graphics-capable DC plasma display with its own control electronics.

Plug assignment



Pin base J2

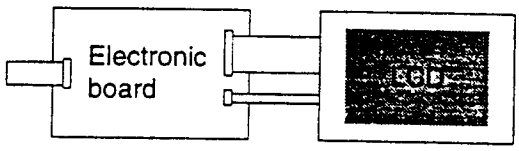
J2 Pin base voltage supply ZID

Pin	Function[1]	Function[2]
1	5V DC	200V DC
2	–195V DC	0V[3]
3	–190V DC	5V DC

[1] Plug inserted
[2] Plug *not* inserted
[3] Reference potential to pins 1 and 3

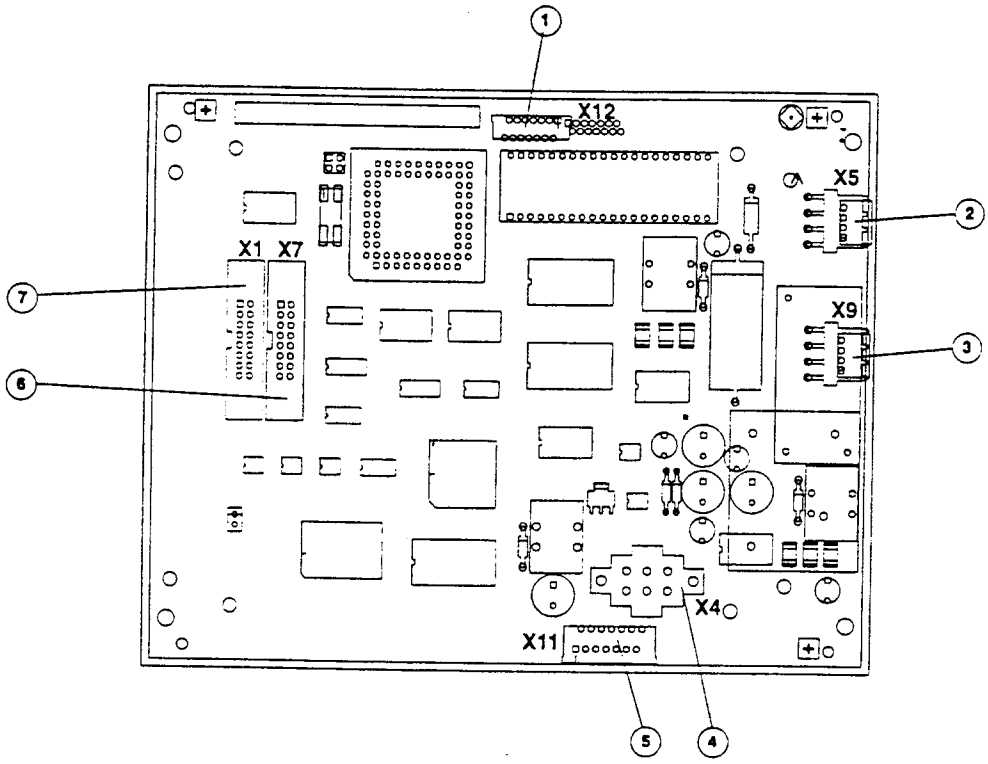
KID Compact information display

Layout



The compact information display KID consists of an electronic board and an LCD (Liquid Crystal Display).

Layout printed circuit board KID



Electronic board KID

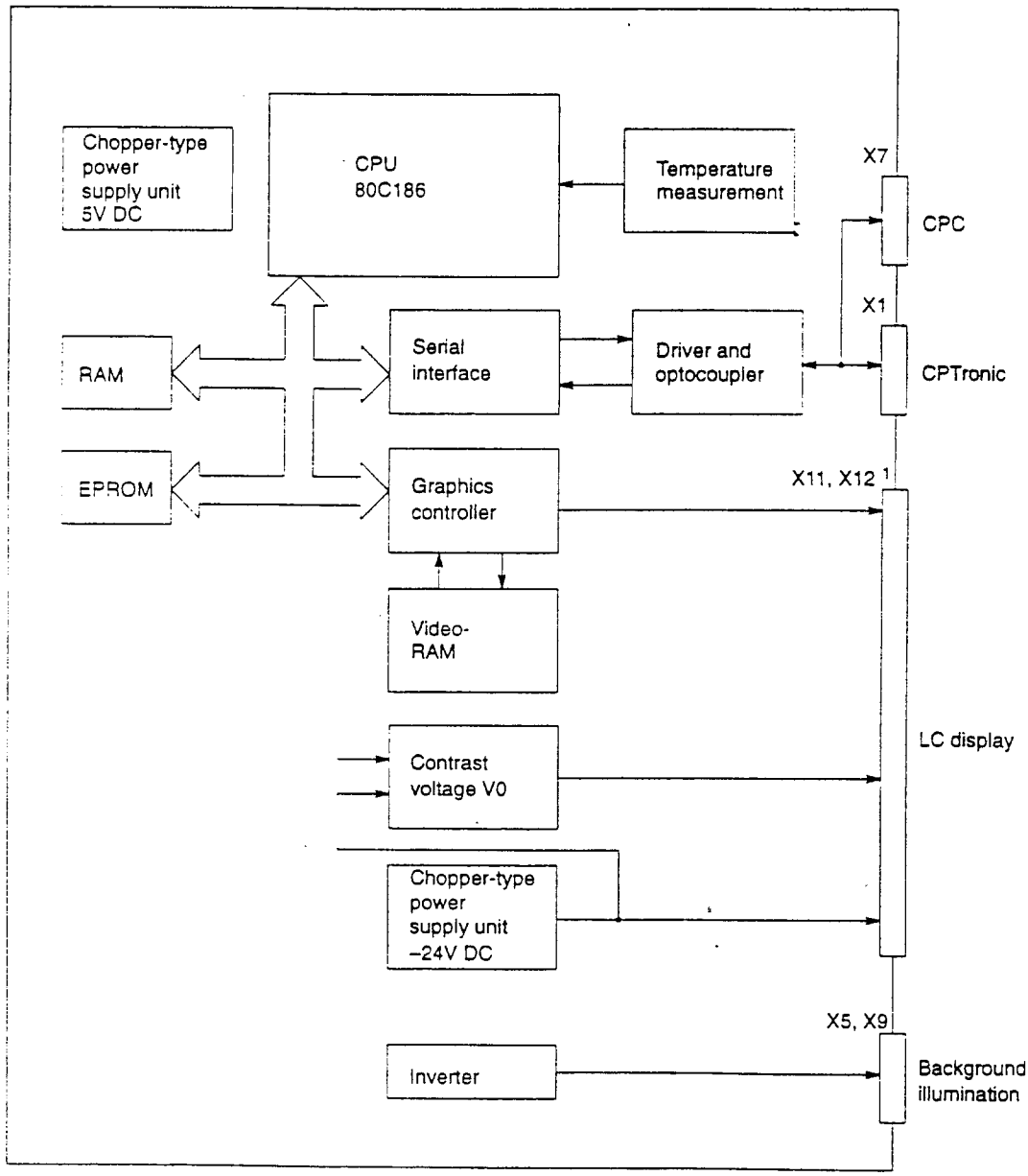
① X12 Male connector, interface LC display [1]
② X5 Male connector, background illumination
③ X9 Male connector, background illumination
④ X4 Male connector, supply voltage
⑤ X11 Male connector, interface LC display [1]
⑥ X7 Male connector, serial interface CPC [1]
⑦ X1 Male connector, serial interface CPTronic

[1] Application–dependent

Task

The compact information display is used to display operational, control and monitoring functions on a printing press.

Block diagram

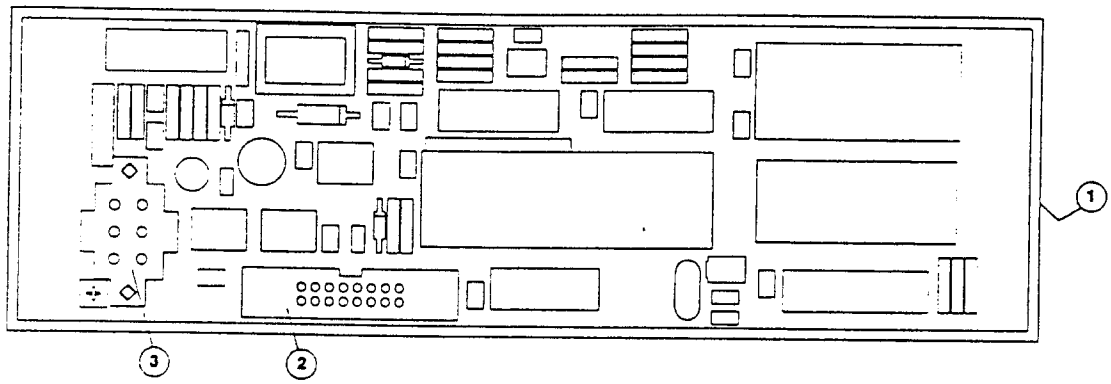


Simplified block diagram KID

[1] Application–dependent

MID Press display

Layout



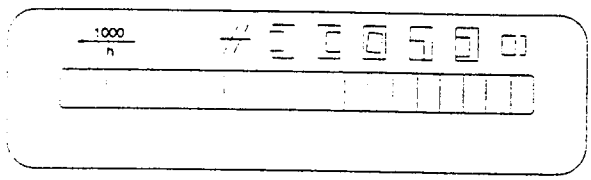
Press display MID

① X3 Pin base
LCD (on solder side)

② X2 Pin base
serial interface

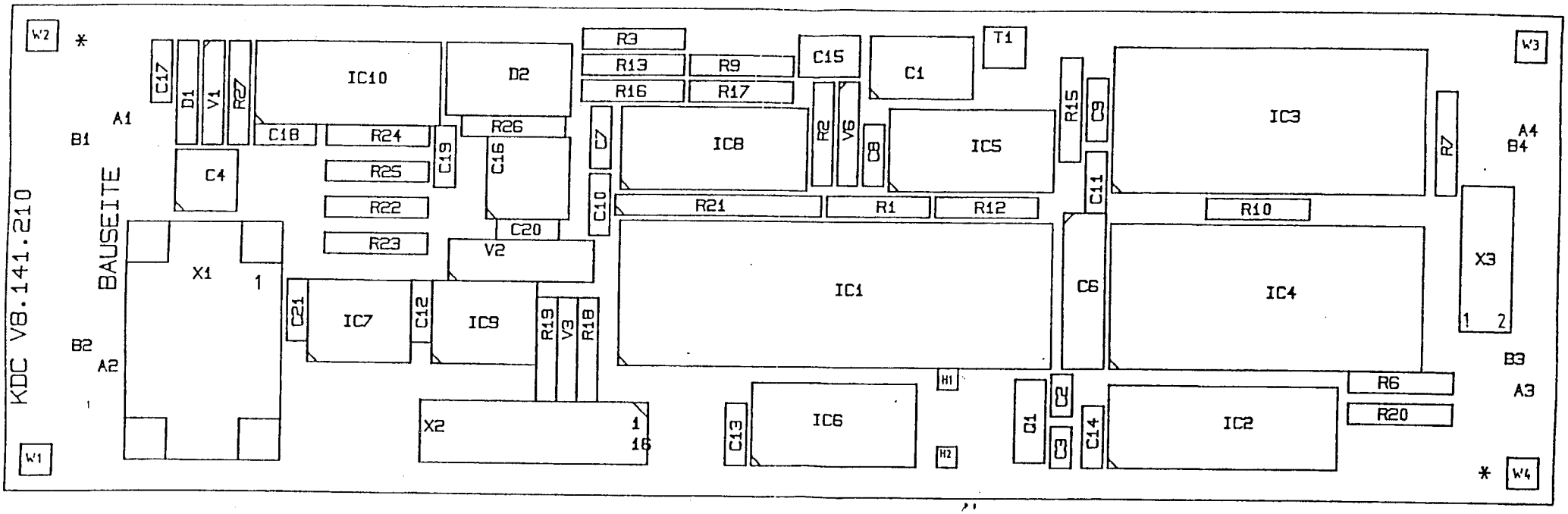
③ X1 Pin base
power supply and coding

Task



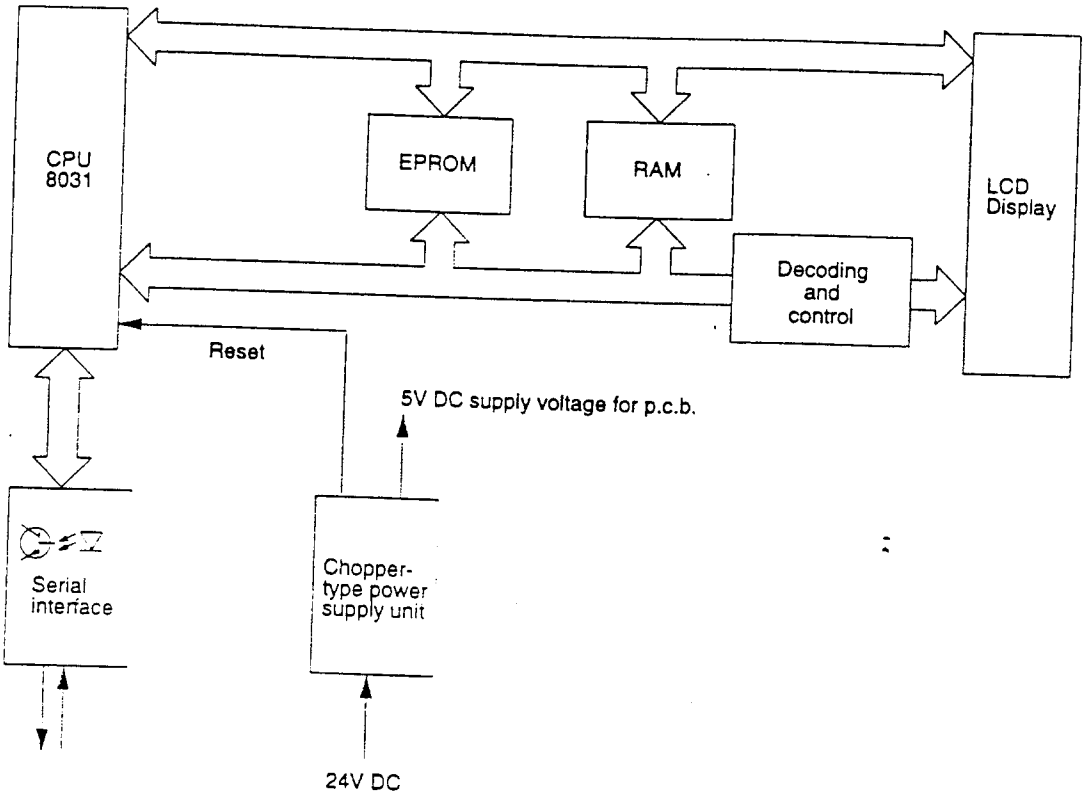
LCD

In the LCD of the press display MID, different press parameters appear, e.g. degree and malfunctions.



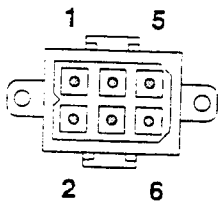
Heidelberger Druckmaschinen Aktiengesellschaft	Typ	Bl. Nr.	HDM-Nr.	Dat. / Name
Datum	Urheberschutzvermerk nach DIN 34		Ersatz für	Änd.
Gezeich.	Bestückungsplan KDC (A1D)			Zeichnungs-Nr. V8.141.211
Geprüft				

Block diagram



Simplified block diagram of MID

Pin assignment



Pin base X1

X1 Pin base / power supply and coding

Pin	Function	
1	⊥ 24	
2	24V DC	
3	⊥ Code	Jumper for MID on delivery console
4	Code 0	
5	Code 1	
6	Code 2	

Futterlieb, Martin RSC-Bangkok

Von: Ischebeck, Uwe VKD 4217
An: Nielsen, Poul EAC-Levison; Komulainen, Unto EAC-Finnland; Hagenbuch, Kai 4300; SER - Utset, Manel; Bank, Fred HDC TOR; Futterlieb, Martin RSC-Bangkok; Hotline Elektronik VKD 4487; Lang, Manfred VTI2 4227; Pretzsch, Wolfgang VTI2 4237; Petermann, Rudolf VTI2 4232; Schirmer,Klaus VTA 4228; York, John HDU-SERVICE; Scott, Tony HDU-Service; Technical HDUK-TECH; Austin, Geoff Australia; Biddolph, Andrew Australia; Cummins, Tom Australia; Fox, Richard Australia; Li, Ambrose EAC Hongkong; Thorne John New Zealand; Sorbo Luigi BU1; Gernez, Jean Pierre; Mackfeld, Martin RSC-HKG
Betreff: Software Version 12.5, 104.5; 13.x, 105.x
Datum: Montag, 27. Januar 1997 15:5716:07
Priorität: Hoch

Dear Sirs

in the past we realized, that some service-/spare-part-organizations ordered software which doesn't correspond to the machine mentioned in the order.

Therefor we want to tell you where the software may be implemented:

SW 12.5 HDM-00.785.0141 only for SM / CD 102 and SM 74 modular
SW 104.5 HDM-00.785.0140 only for SM 74 compact.
both together with the Display-Software (ZID) HDM 00.785.0112
THIS SOFTWARE MAY NOT BE USED ON SM 52.

SW 13.0 HDM-00.785.0147 only for SM52 modular
SW105.0 HDM-00.785.0149 ZID only for SM52 compact with ZID
both together with ZID-Software HDM 00.785.0150.
SW105.0 HDM-00.785.0148 KID only for SM52 compact with KID.
THIS SOFTWARE MAY NOT BE USED FOR SM74 OR SM/CD 102.

SW 13.1 HDM 00.785.0162 only for SM74 modular
SW105.1 HDM 00.785.0163 only for SM74 compact.
both together with the ZID-Sotware HDM 00.785.0164.
THIS SOFTWARE MAY NOT BE USED ON SM/CD102 or SM52.
Please do not order this Software unless you have actual problems. You will get this software automatically for all SM52compact (of a special production-period) in the next weeks. You will be informed by a Service-Information.

If you equipe a machine with a wrong software you may cause malfunction and perhaps a machine-crash.

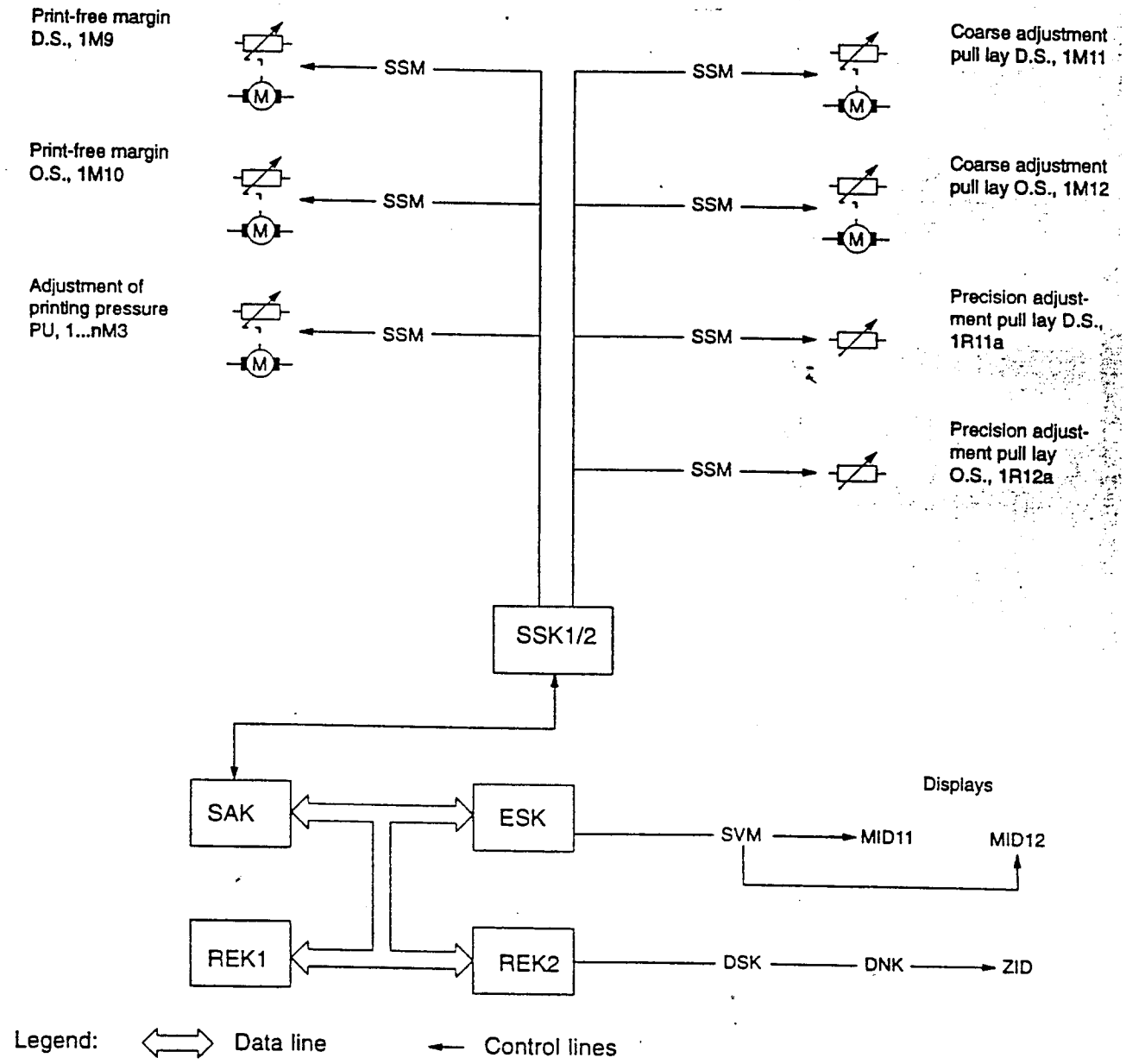
PLEASE OBSERVE THE COMBINATION OF MACHINE AND SOFTWARE.

Best regards.
HEIDELBERGER DRUCKMASCHINEN AG
Service center

Uwe Ischebeck

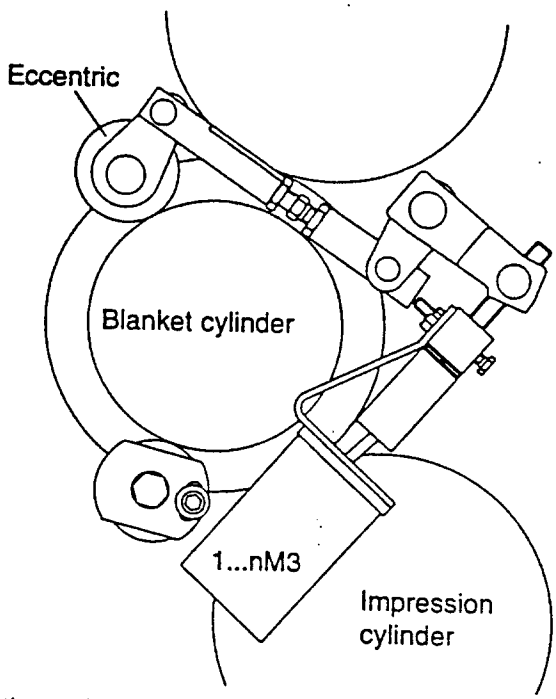
Size adjustment

Block diagram

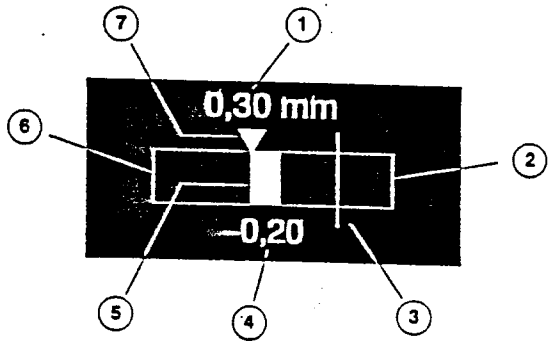


Block diagram of size adjustment

1...nM3 Adjustment of printing pressure



Printing unit, side view



Explanation of the display

The servo-drive "Adjustment of printing pressure" changes the gap between blanket cylinder and impression cylinder. The rotation of the drive is transmitted to the blanket cylinder via a worm gear and a gear segment. The operator thus influences the pressure exerted on the print sheet during the printing process.

Automatic positioning

When the paper thickness is entered under the command "Presetting", the servo-drive automatically positions to the value:

paper thickness – 0.1 mm = pressure.

Examples:

0.07 – 0.1 = –0.03
–0.03 x –1 = 0.03

0.30 – 0.1 = 0.20
0.20 x –1 = –0.20

The correction factor (–1) ensures that the result is shown correctly in the "Actual value display".

① Paper thickness entered

② Upper adjustment limit (pressure = 0.20) for the printing pressure (min. gap between blanket cylinder and impression cylinder)

③ "0" position of the printing pressure

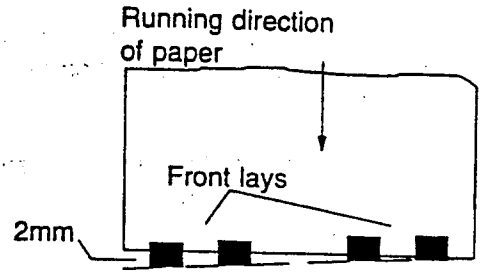
④ Present value of the printing pressure

⑤ Graphical representation of the printing pressure

⑥ Lower adjustment limit (pressure = – 0.40) for the printing pressure (max. gap between blanket cylinder and impression cylinder)

⑦ Symbol for the paper thickness entered

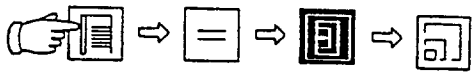
1M9/1M10 Print-free margin



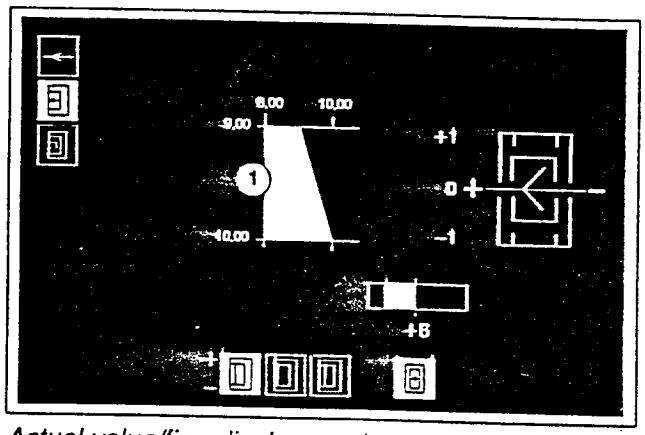
Adjustment of front lays to change the "Print-free margin"

The print-free margin on the sheet is adjusted by means of two servo-drives.
These servo-drives change the position of the front lay stop. The front lays are fitted on a shaft which, for adjustment of the print-free margin, can be adjusted parallel or at an angle to the feed table. For this purpose, one servo-drive is installed on the drive side and one on the operator side. With these two servo-drives the front lays can be influenced in such a way that the print-free margin measures between 8 mm and 10 mm. The adjustment is made at the control console.

Graphical representation in the ZID

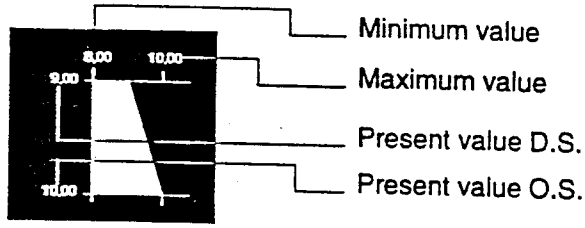


Selection "Print-free margin"



Actual value/fine display

① Graphical representation of the "Print-free margin"



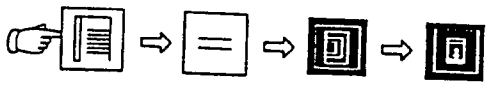
Print-free margin O.S. 

Print-free margin D.S. and O.S. 

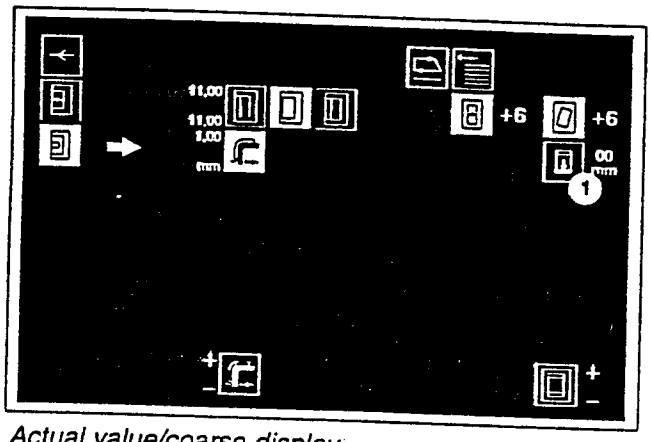
Print-free margin D.S. 

To adjust the print-free margin, press the corresponding function button. Then make the adjustment within a range from 8.00 mm to 10.00 mm by means of the left-hand +/– buttons.

Precision adjustment of pull lay



Selection



Actual value/coarse display

① Symbol and indication of the current value for the precision adjustment of the pull lay

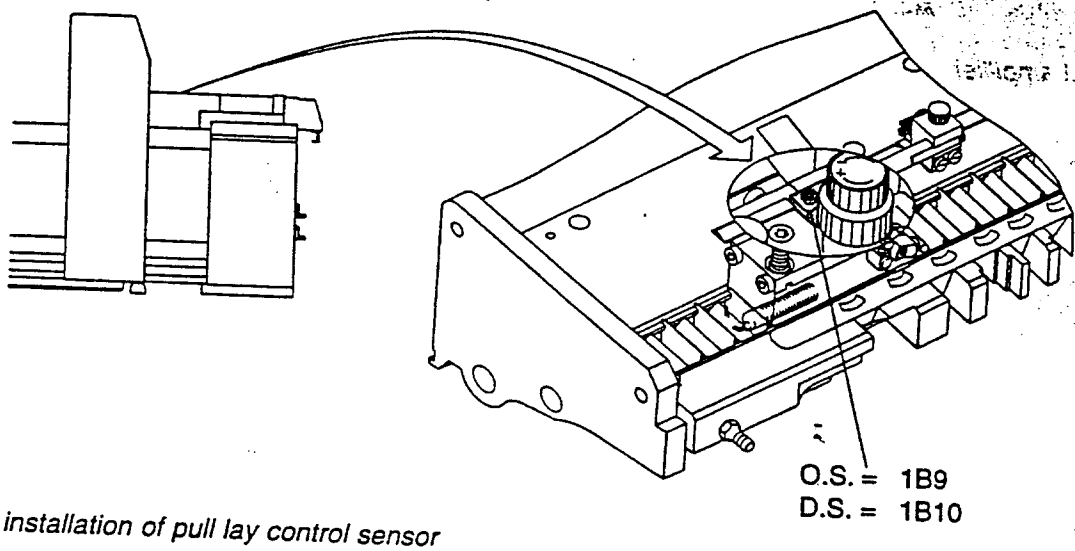
The symbol shows the active pull lay:

arrow pointing up = pull lay on D.S. active
arrow pointing down = pull lay on O.S. active.

With the right-hand +/– buttons the active pull lay can be precision-adjusted. Adjustment is possible within a range of +/– 0.8 mm in relation to the preset format.

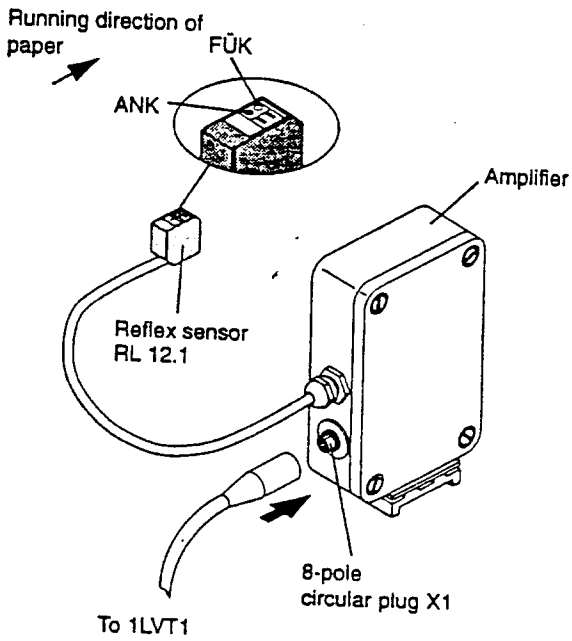
1B9/1B10 Pull lay control

Place of installation



Place of installation of pull lay control sensor

Layout and task



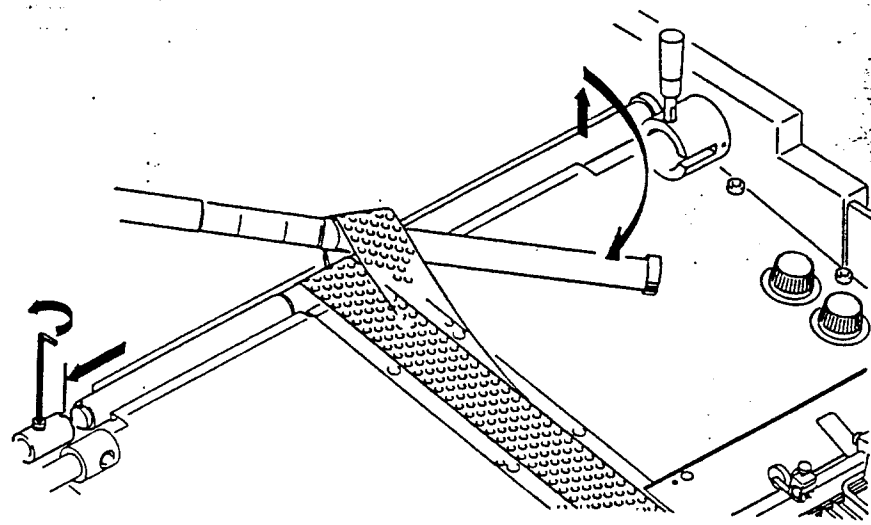
Reflex sensor with amplifier

The pull lay control (ZMK) registers the lateral alignment of the sheet to be fed in. The ZMK consists of:

- two reflex sensors (RL 12.1), one on the D.S. and one on the O.S.,
- an amplifier for each sensor.

The reflex sensors serve for paper detection and are firmly connected with the amplifiers via a cable. The reflex sensors contain the two optical sensors ANK and FÜK. During the pull lay control only the ANK-sensors are active.

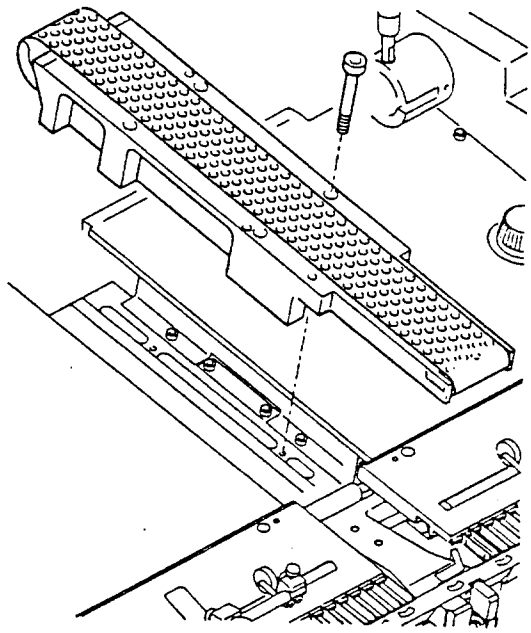
The amplifiers of the two reflex sensors are located at the side frame on the operator side, under the feed table.



Removing the tape driving shaft

❷ Removing the tape driving shaft:

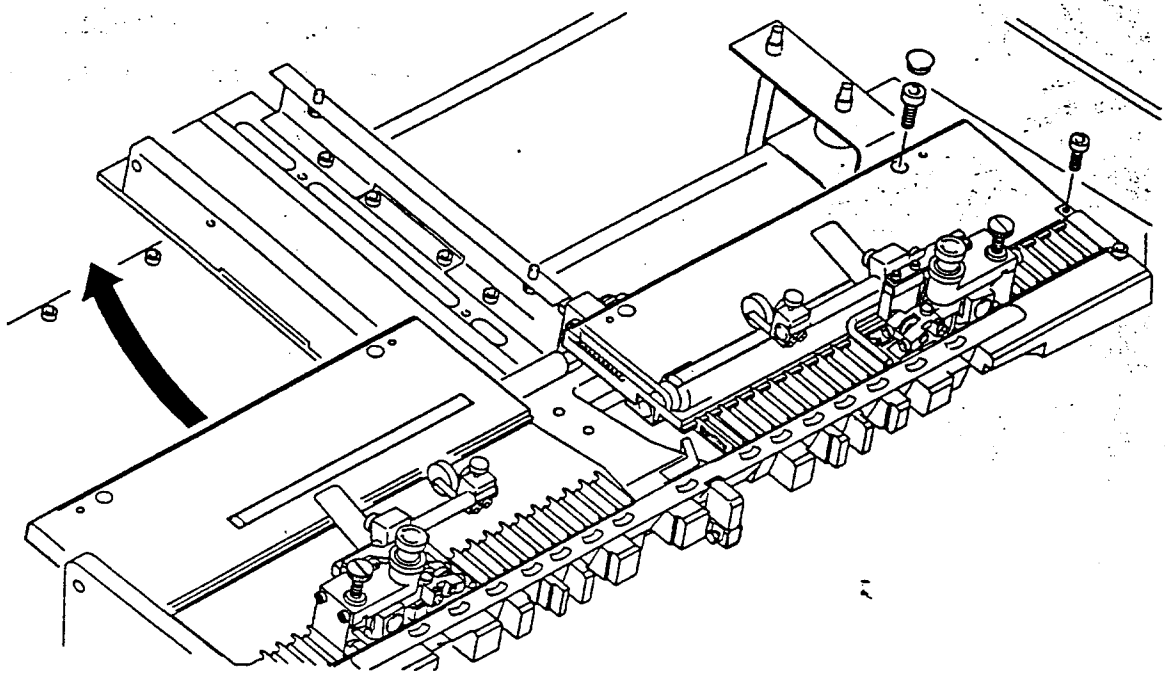
- Loosen the fixing bolt on the D.S., but do not unscrew it entirely.
- Push the sleeve on the D.S. towards the side frame on the D.S.
- Remove the tape driving shaft from underneath the suction tape.



Removing the suction tape module

❸ Removing the suction tape module:

- Loosen the bellows.
- Remove the four fixing bolts.
- Take out the suction tape module.



Removing the small sheet-metal plates

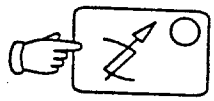
❻ Removing the small sheet-metal plates:

- Take the four rubber plugs on the D.S. and O.S. off the fixing bolts.
- Remove the fixing bolts.
- Remove the two fixing bolts on the D.S. and O.S. of the bellows.
- Raise the sheet-metal plates, pull them towards the suction head and take them out.

Note:

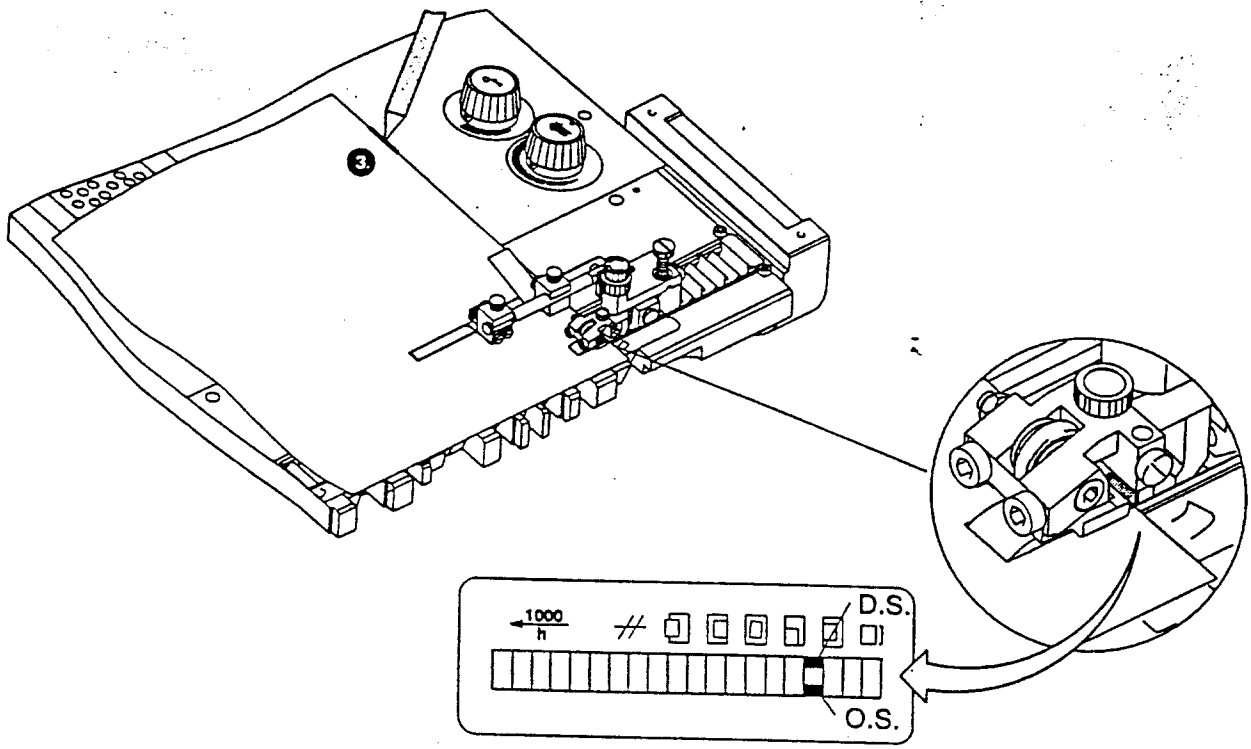
First take off the toothed belt below the small sheet-metal plates!

Adjustment



Illuminated pushbutton "Safe"

❶ Press the illuminated pushbutton "Safe".



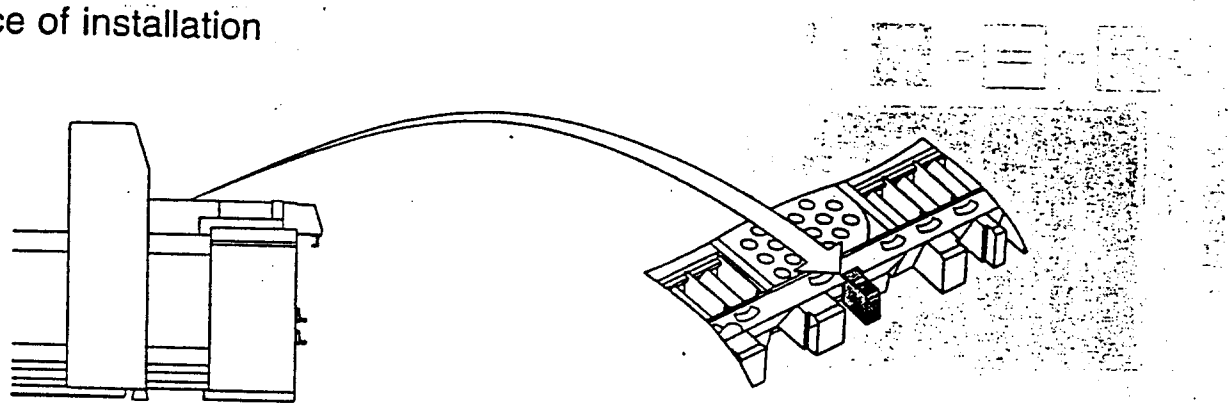
Adjusting the sensor

❷ Place a sheet against the pull lay. When the sensor detects the sheet, the circuit state is displayed in the MID.

❸ Mark the sheet edge on the sheet-metal plate.

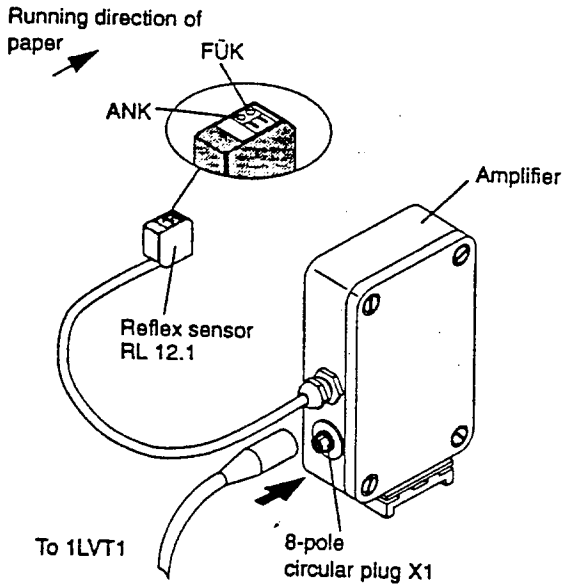
1B49 Sheet alignment control

Place of installation



Place of installation of sensor for sheet alignment control

Layout and task



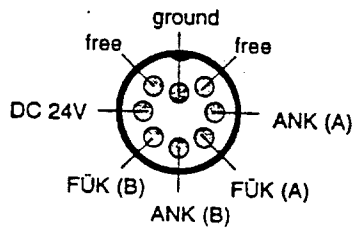
Reflex sensor with amplifier

The reflex sensor RL 12.1 is an optical sensor which registers and checks sheet alignment (BAK). The sensor consists of two independent optical systems – ANK and FÜK – which are located in a housing. Viewed in the running direction of the paper, the paper first covers the ANK sensor.

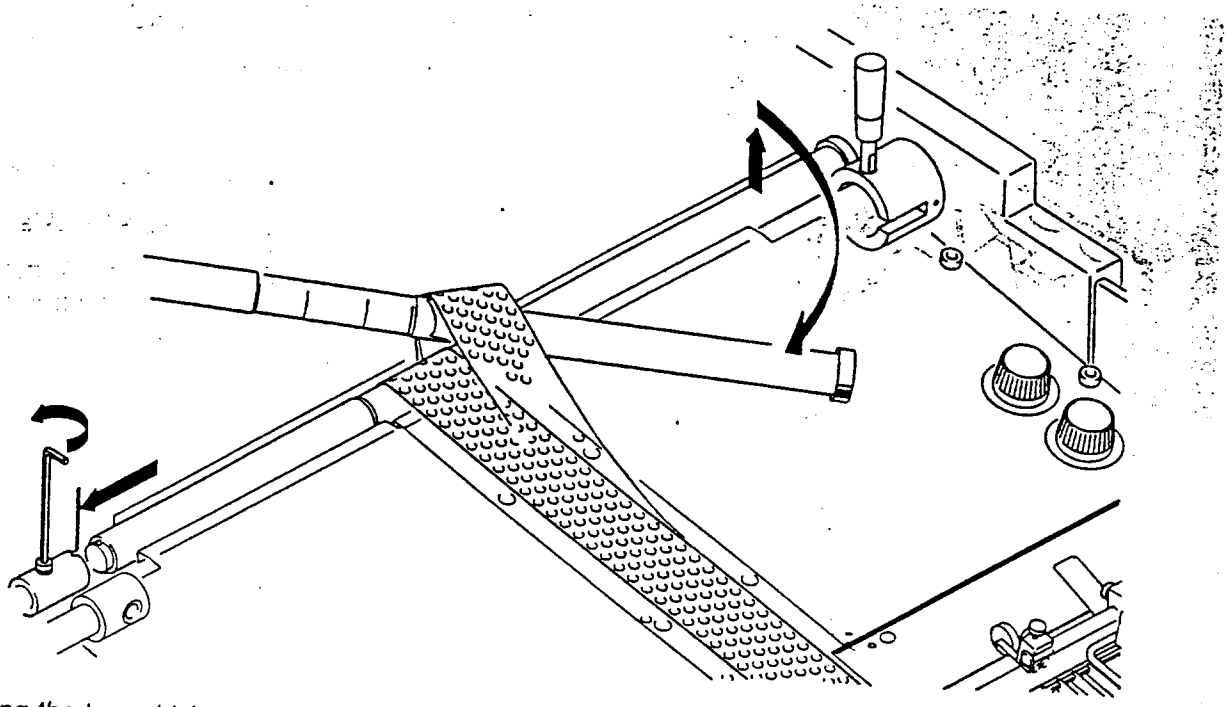
ANK = sensor for sheet alignment control
FÜK = sensor for overshooting sheet control.

In the amplifier the output signals of the reflex sensor are amplified and then transmitted to the electronic control system. The amplifier is located at the side frame on the operator side, under the feed table.

Pin assignment



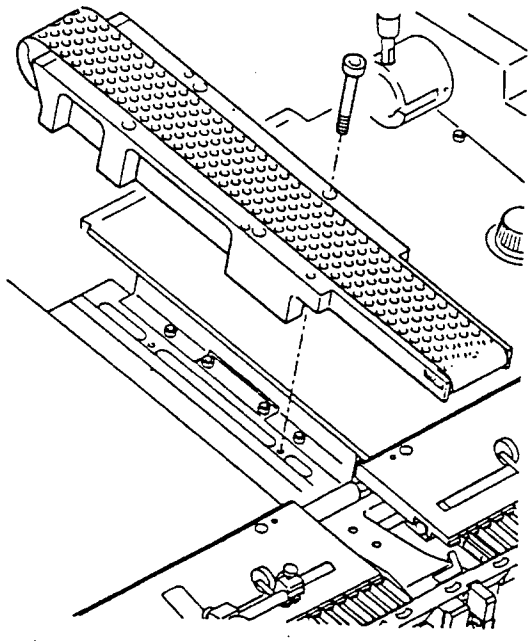
Plug X1 at amplifier



Removing the tape driving shaft

❹ Removing the tape driving shaft:

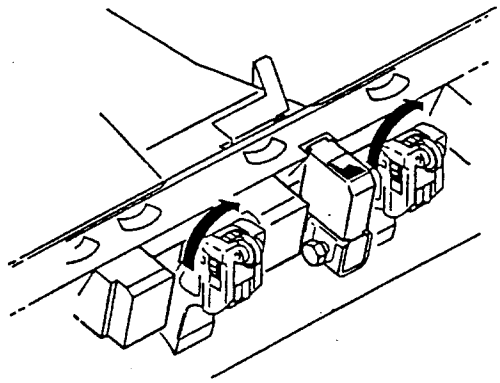
- Loosen the fixing bolt on the D.S., but do not unscrew it entirely.
- Push the sleeve on the D.S. towards the side frame on the D.S.
- Remove the tape driving shaft from underneath the suction tape.



Removing the suction tape module

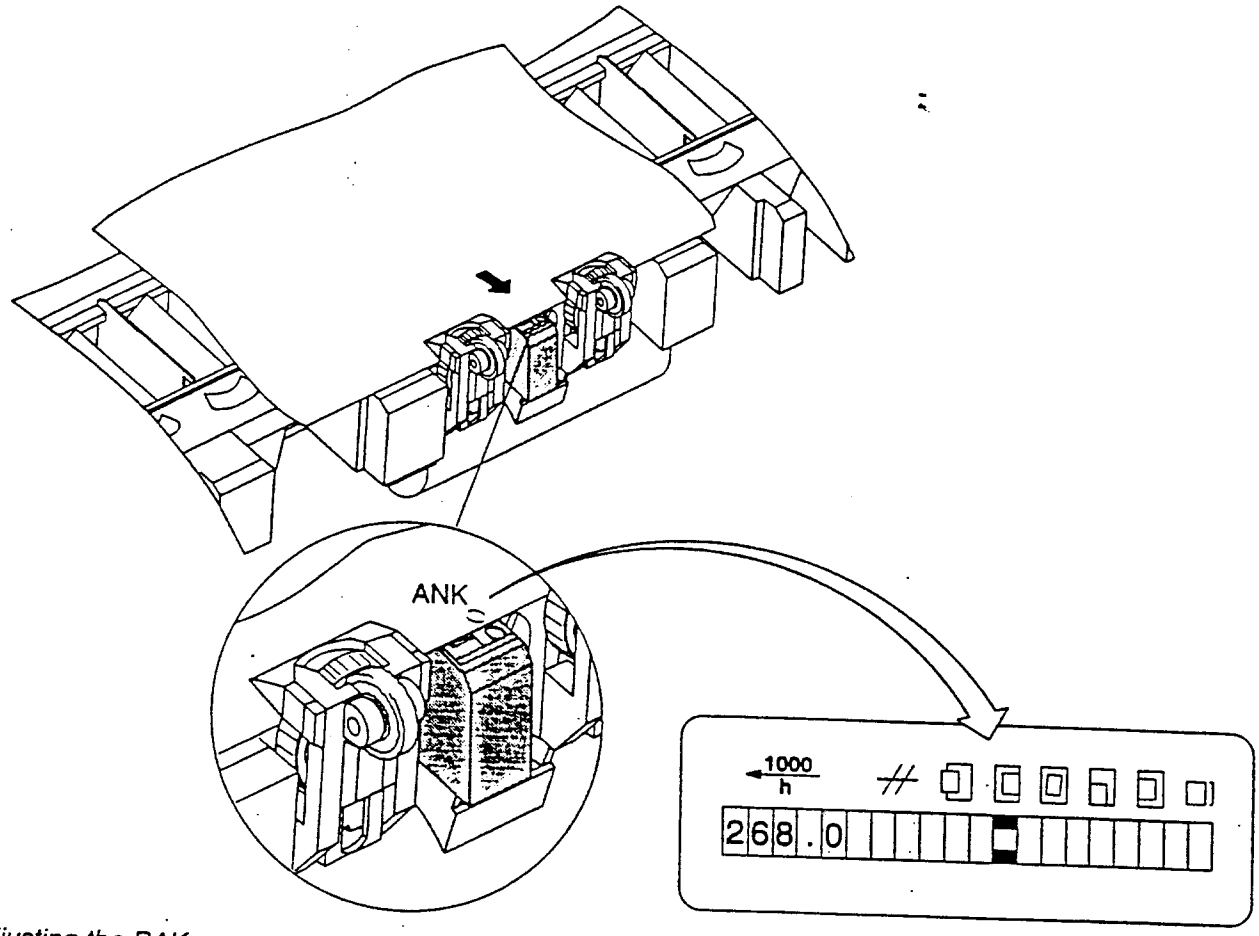
❺ Removing the suction tape module:

- Loosen the bellows.
- Remove the four fixing bolts.
- Take out the suction tape module.



Adjusting the front lay

❸ Turn the left and right front lays anticlockwise to the stop by means of the knurled wheel.

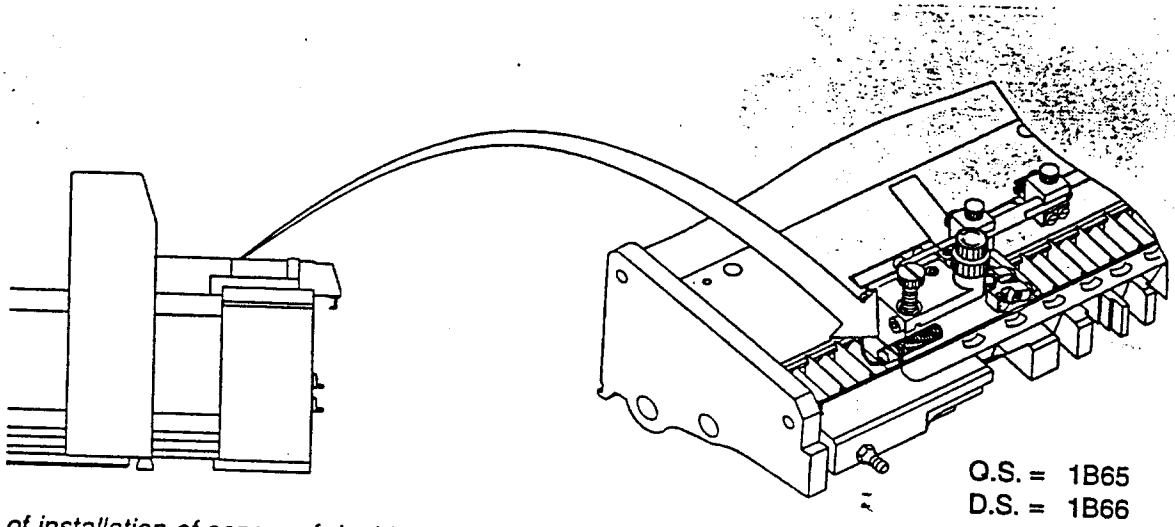


Adjusting the BAK sensor

❹ Cover the ANK-sensor with a sheet of paper. The ANK symbol in the press display MID is lit.

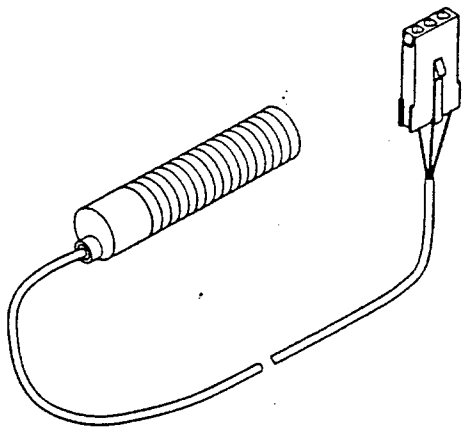
1B65/1B66 Double-sheet detector

Place of installation



Place of installation of sensor of double-sheet detector

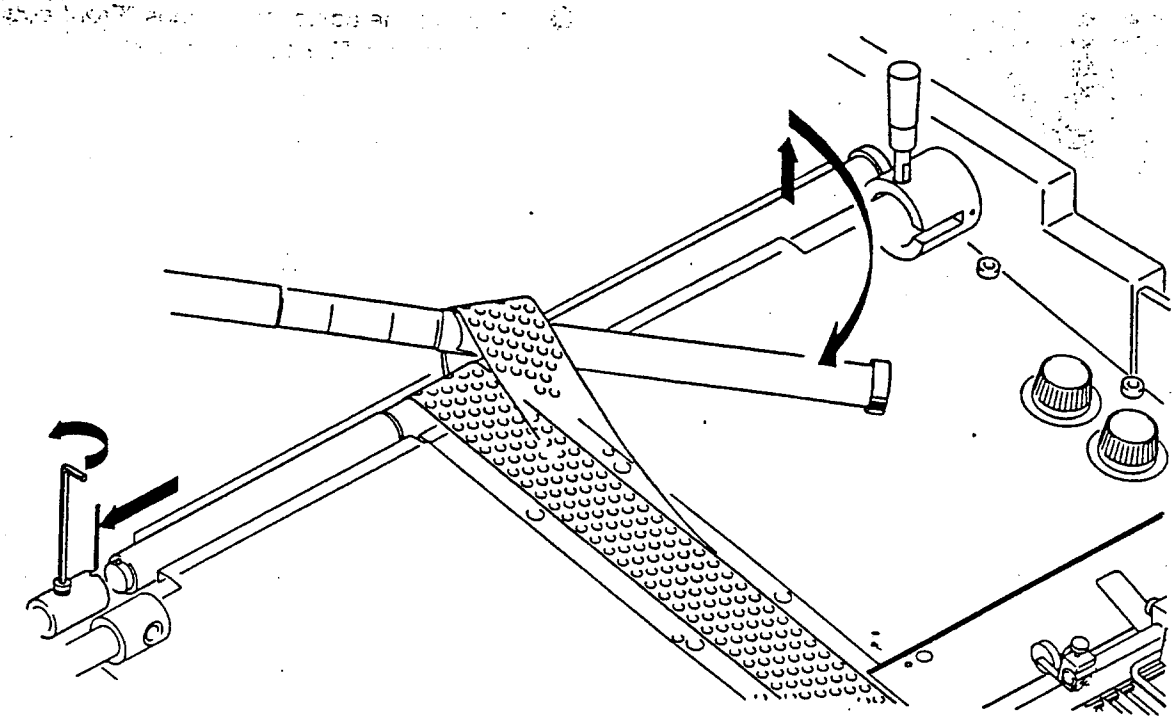
Layout and connection



Sensor of double-sheet detector

The inductive sensor for double-sheet detection (DBE) registers contact-free the deflection of the pull roll and thus the thickness of the sheet to be fed in.

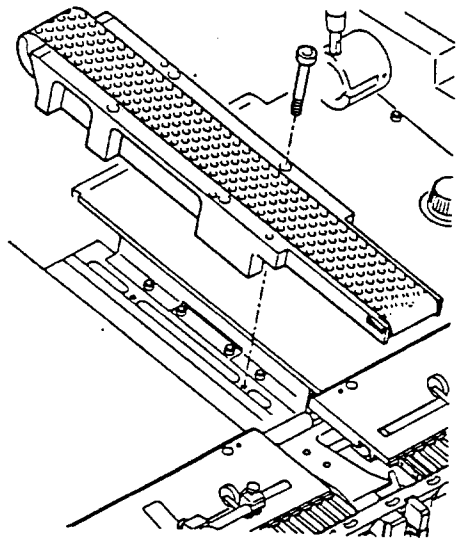
Core colour		Function
black	=	signal
brown	=	DC 24 V
blue	=	GND



Removing the tape driving shaft

❸ Removing the tape driving shaft:

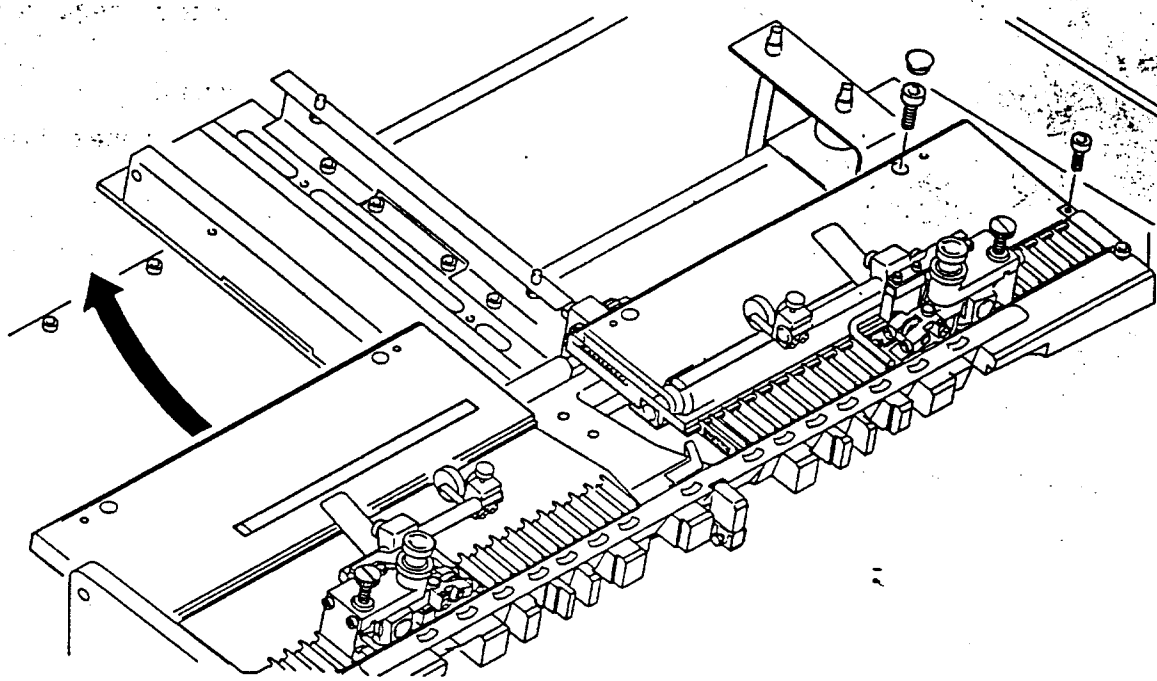
- Loosen the fixing bolt on the D.S., but do not unscrew it entirely.
- Push the sleeve on the D.S. towards the side frame on the D.S.
- Remove the tape driving shaft from underneath the suction tape.



Removing the suction tape module

❹ Removing the suction tape module:

- Loosen the bellows.
- Remove the four fixing bolts.
- Take out the suction tape module.



Removing the small sheet-metal plates

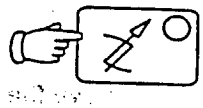
❻ Removing the small sheet-metal plates:

- Take the four rubber plugs on the D.S. and O.S. off the fixing bolts.
- Remove the fixing bolts.
- Remove the two fixing bolts on the D.S. and O.S. of the bellows.
- Raise the sheet-metal plates, pull them towards the suction head and take them out.

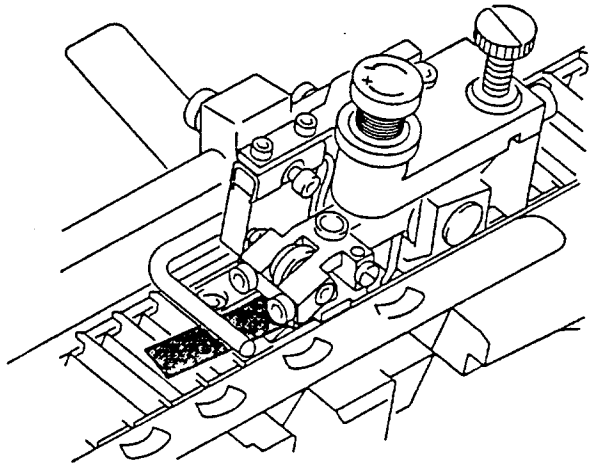
Note:

First take off the toothed belt below the small sheet-metal plates!

Adjustment



Illuminated pushbutton "Safe"

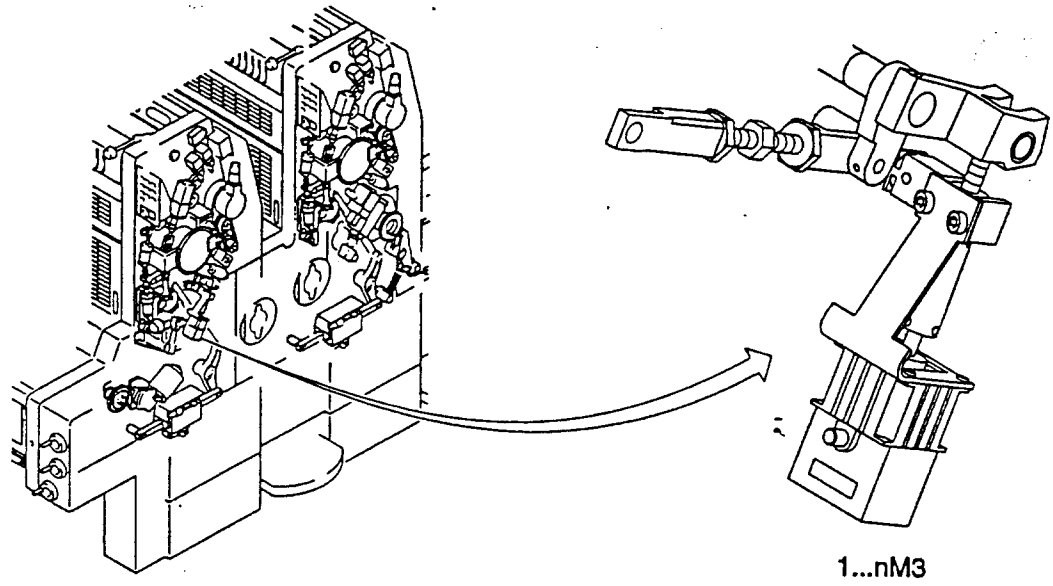


Adjusting the sensor

1. Press the illuminated pushbutton "Safe".
2. Turn the screw for adjustment of the pull strength to its central position.
3. Inch the press until the pull roll rests on the 0.03 mm thick plate (feeler gauge) and starts to draw in the plate.

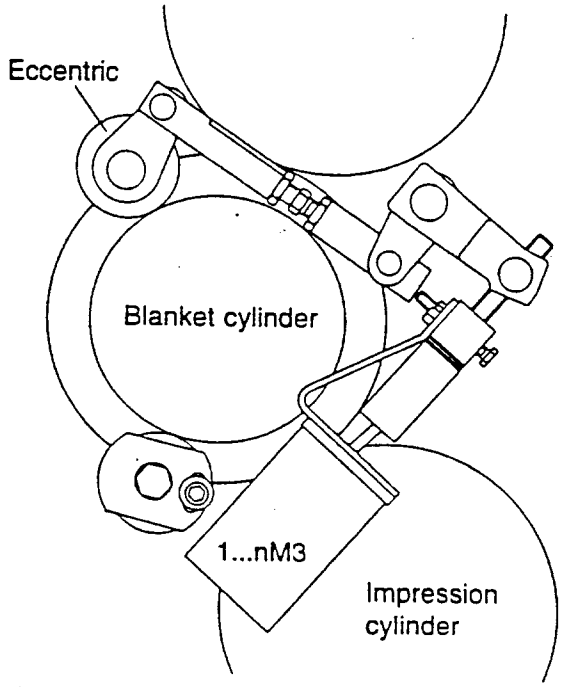
1...nM3 Adjustment of printing pressure

Place of installation



Place of installation of servo-drive

Layout and task

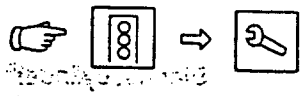


Printing unit, side view

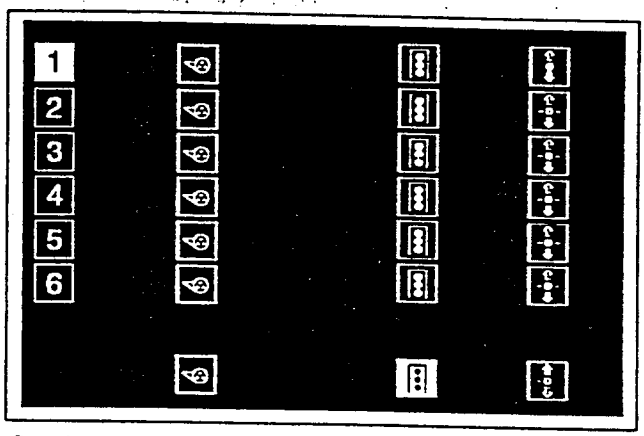
The servo-drive "Adjustment of printing pressure" is a d.c. motor with brushes and potentiometer for position feedback.

By means of the eccentric, the servo-drive changes the gap between blanket cylinder and impression cylinder. This influences the printing pressure.

Removal and installation



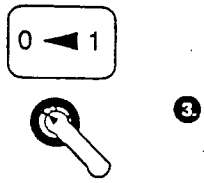
Buttons to be actuated



Service display: "Printing units"

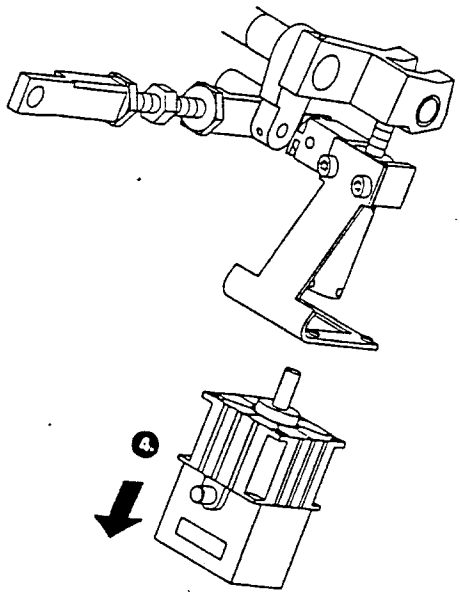
❶ Select the service display "Printing units".

❷ Trigger the function "Impression on".

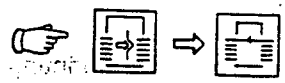


❸ Switch off the press.

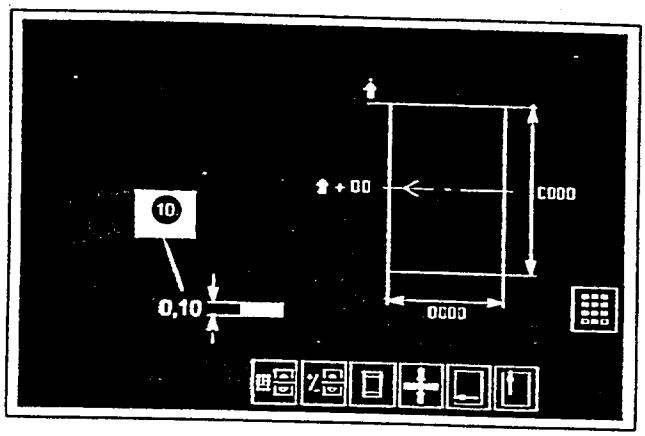
❹ Remove the servo-drive.



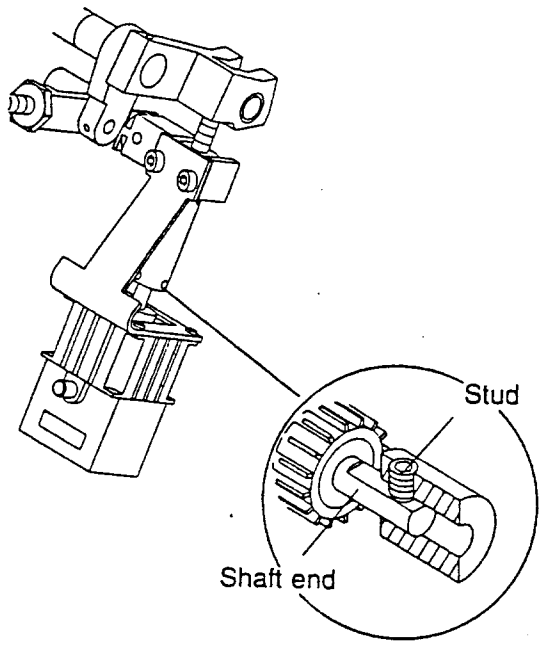
Removal



Selecting the command "Presetting"



Display "Presetting"



Installing the servo-drive

9. Select the command "Presetting".

10. Enter a paper thickness of 0.10 mm and enable the command "Presetting".

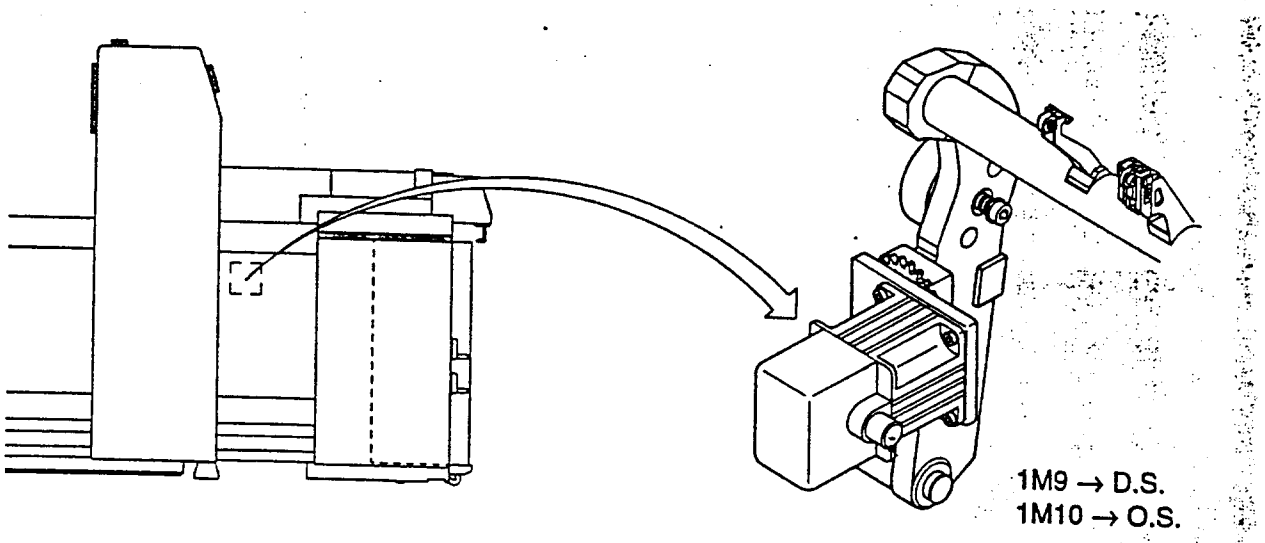
Note:
The servo-drive positions.

11. Install the servo-drive.

Note:
When fastening the servo-drive make sure the stud presses against the surface of the shaft end.

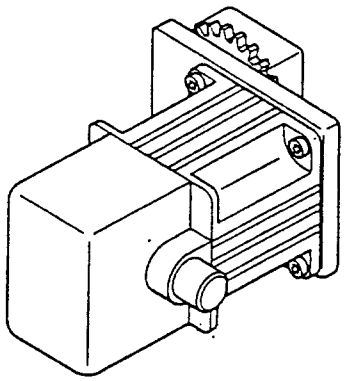
1M9/1M10 Print-free margin

Place of installation



Place of installation of servo-drive "Print-free margin"

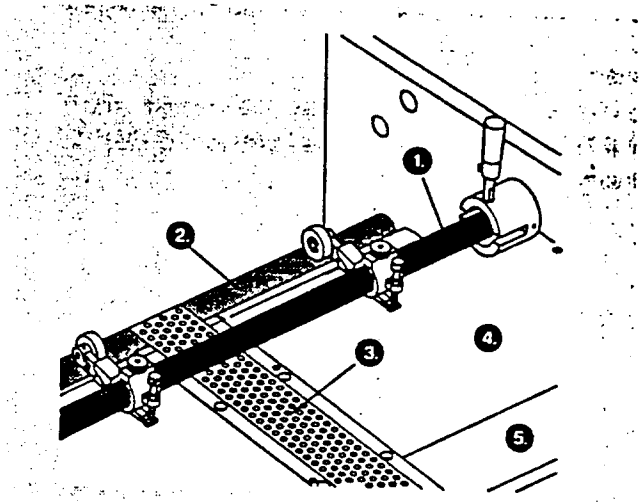
Layout and task



Servo-drive "Print-free margin" 1M9

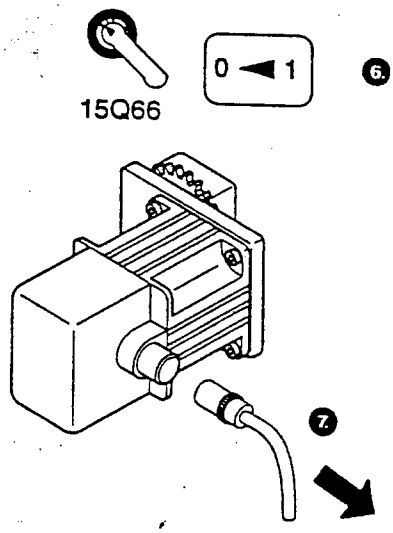
The servo-drive "Print-free margin" is a d.c. motor with brushes and potentiometer for position feedback.
By means of the two servo-drives "Print-free margin" 1M9/1M10 the gripper margin is set from the control console.

Removal and installation



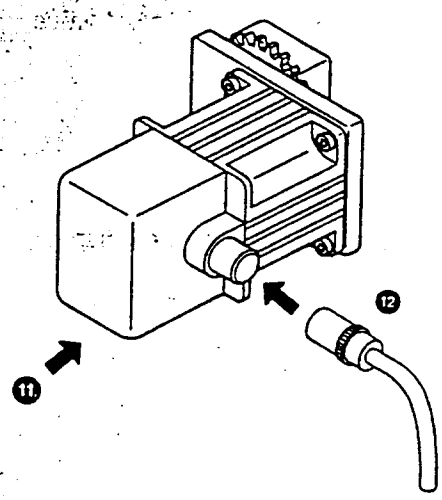
Removing the sheet-metal plates

1. Remove the forwarding roller shaft.
2. Remove the driving shaft.
3. Remove the suction tape module together with the suction tape.
4. Remove the large sheet-metal plates on the D.S. and O.S.
5. Remove the small sheet-metal plates on the D.S. and O.S.



Removing the servo-drive

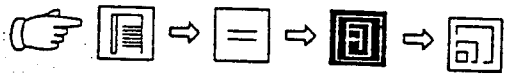
6. Turn off the main switch 15Q66.
7. Withdraw the plug from the servo-drive.



Installing the servo-drive

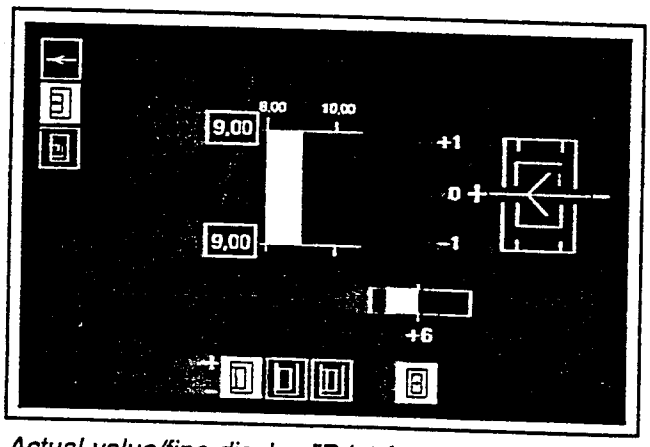
11 Fasten the servo-drive to the motor base-plate.

12 Insert the plug.



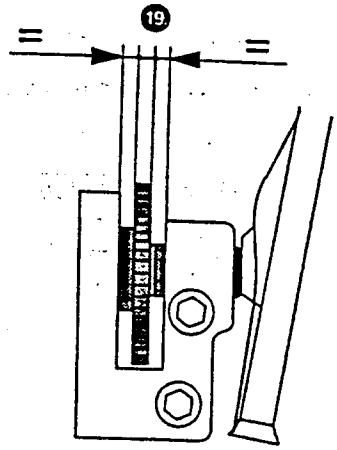
Selecting "Print-free margin"

13 Turn on the main switch 15Q66 and select "Print-free margin".



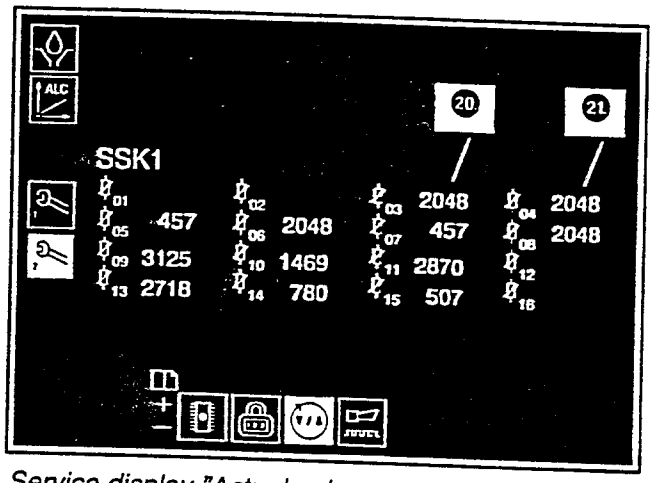
Actual value/fine display "Print-free margin"

14 Set the print-free margin to 9 mm.



Checking the position of the gear wheel

⑲ Check that the gear wheel runs in the middle of the slot in the motor baseplate.



Service display "Actual value servo-drives"

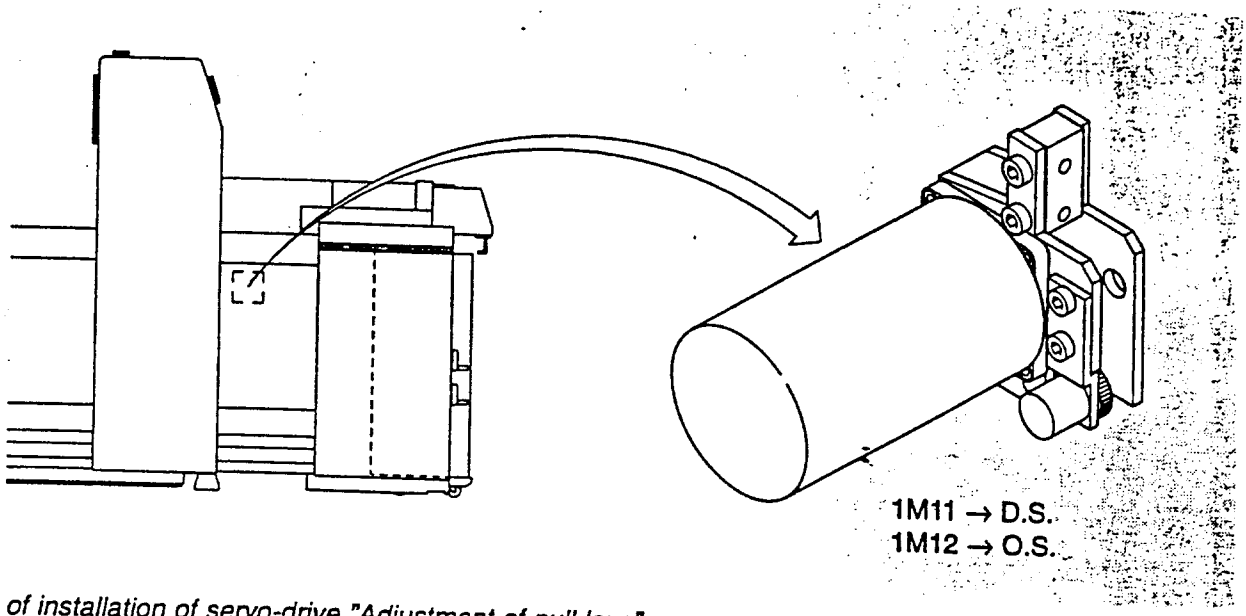
Check the increments in the service display "Actual value servo-drives".

⑳ Servo-drive "Print-free margin" D.S.

㉑ Servo-drive "Print-free margin" O.S.

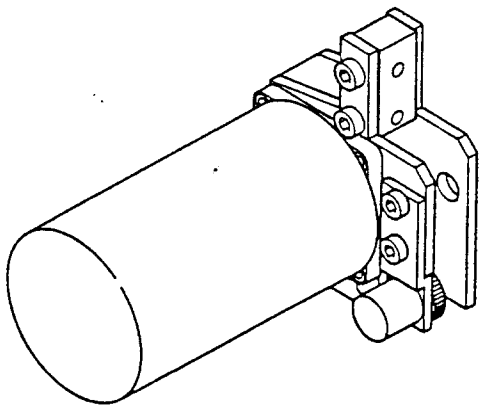
1M11/1M12 Adjustment of pull lays

Place of installation



Place of installation of servo-drive "Adjustment of pull lays"

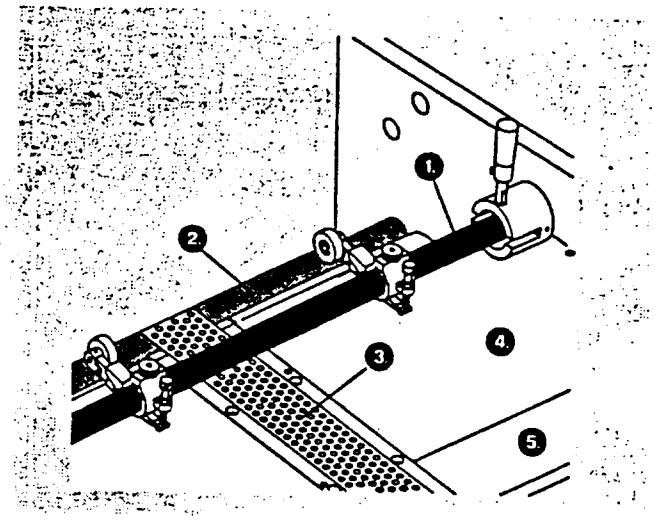
Layout and task



Servo-drive "Adjustment of pull lays" 1M12

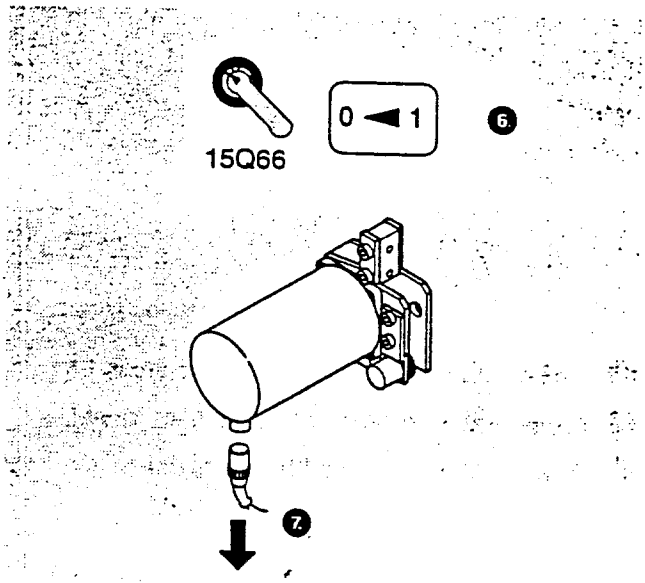
The servo-drive "Adjustment of pull lays" is a d.c. motor with brushes and potentiometer for position feedback.
By means of the two servo-drives "Adjustment of pull lays" 1M11/1M12 the pull lays are positioned from the control console.

Removal and installation



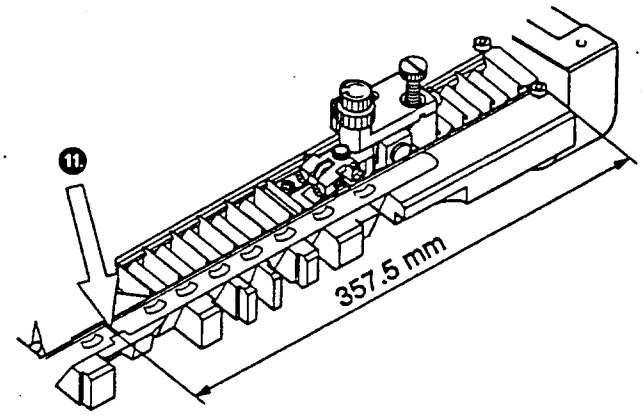
Removing the sheet-metal plates

1. Remove the forwarding roller shaft.
2. Remove the driving shaft.
3. Remove the suction tape module together with the suction tape.
4. Remove the large sheet-metal plates on the D.S. and O.S.
5. Remove the small sheet-metal plates on the D.S. and O.S.



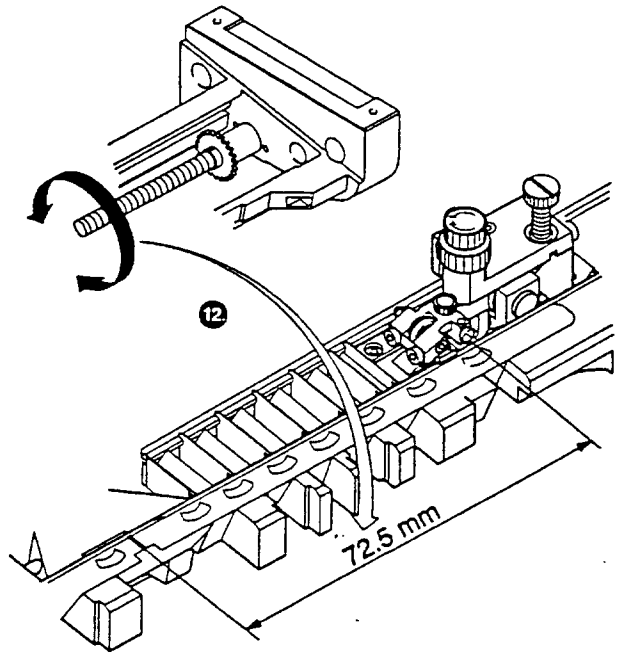
Removing the servo-drive

6. Turn off the main switch 15Q66.
7. Withdraw the plug from the servo-drive.



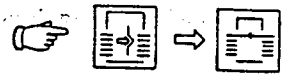
Marking the middle of the press

⓫ Mark the middle of the press on the front edge bar (357.5 mm away from the machined surface of the side frame).



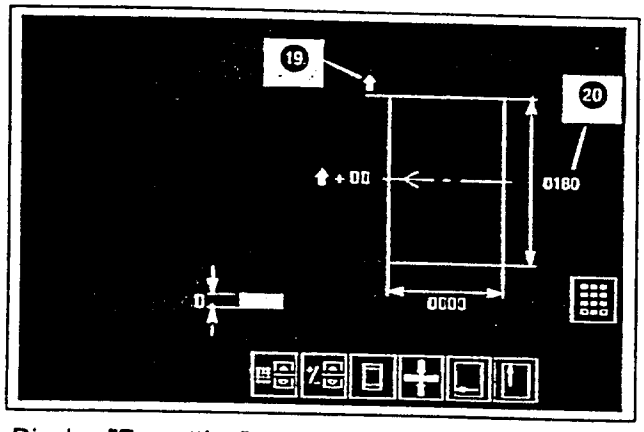
Setting the distance

⓬ Turn the spindle until the distance between the middle of the press and the pull lay stop is 72.5 mm.



Selecting the command "Presetting"

⑱ Select the command "Presetting".

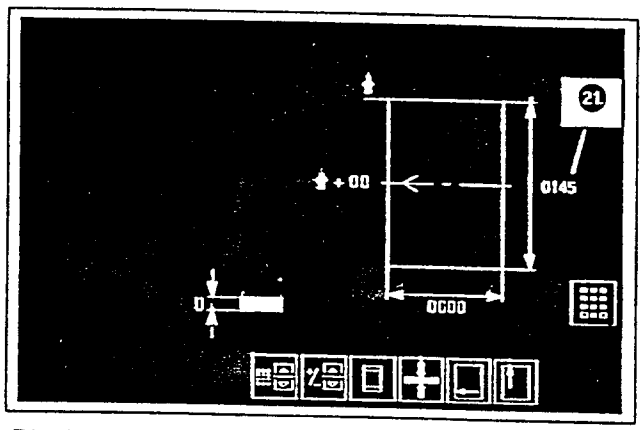


Display "Presetting"

⑲ Select the pull direction.

⑳ Set the sheet width to 180 mm and enable the command "Presetting".

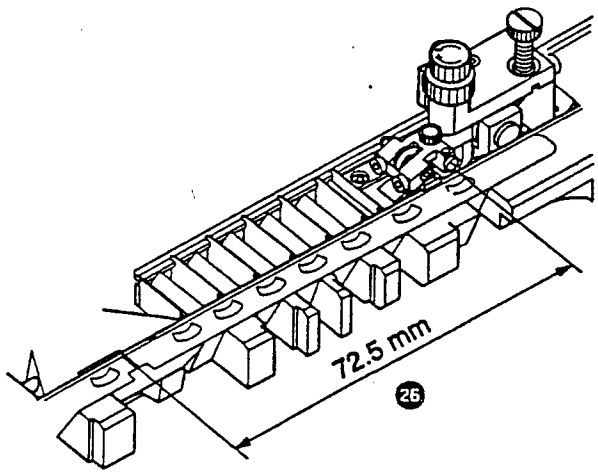
Note:
The servo-drive positions.



Display "Presetting"

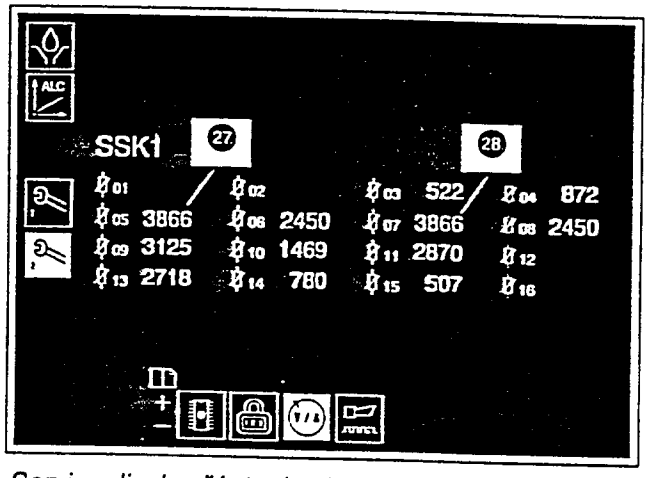
㉑ Set the sheet width to 145 mm and enable the command "Presetting".

Note:
The servo-drive positions.



Checking the distance

26 Check the distance between the middle of the press and the pull lay stop.



Service display "Actual value servo-drives"

Check the increments in the service display.

27 Servo-drive "Adjustment of pull lays" 1M11

28 Servo-drive "Adjustment of pull lays" 1M12

"0" - positions of servo-drives

Sevice Display - " Istwert Stellantriebe "

EWK 1

S 000	1 Sheet arrival control	1128 Inkr. = 0
S 001	2 Cover guide height	3006 Inkr. = 0,4 mm/2928 Inkr = 0,2 mm /
S 002	3 Printfree margin D.S	2048 Inkr. = 9 mm
S 003	4 Printfree margin O.S.	2048 Inkr. = 9 mm
S 004	5 Side lay D.S.	*356 Inkr. = sheet size 740
S 005	6 Side lay O.S.	*356 Inkr. = sheet size 740
006	7 Pressure between blanket and Impression cylinder I	1142 Inkr. = 0
007		

* = 75 mm from side lay stop to the side frame

fine potentiometer at 2048 inkrements in service display "Istwert Analog Eingänge"

(Pos. 5= D.S. ; Pos. 6 = O.S.)

EWK 2

S 008	1 Circumferential register adjustment Unit I	2048 Inkr. = 0
S 009	2 Lateral register adjustment Unit I	2048 Inkr. = 0 = 40mm to side frame
S 010	3 Diagonal register adjustment Unit I	2048 Inkr. = 0 = 4mm space
S 011	4 Circumferential register adjustment Unit II	2048 Inkr. = 0
S 012	5 Lateral register adjustment Unit II	2048 Inkr. = 0
S 013	6 Diagonal register adjustment Unit II	2048 Inkr. = 0
S 014	7 Pressure between blanket and Impression cylinder II	1142 Inkr. = 0
S 015		

pressure 0,2mm ≙ 231 ± 16 Inc. ≙ 0,15mm distance
" 0,00mm ≙ 1140 ± 16 Inc ≙ 0,35mm "
" −0,55mm ≙ 3642 ± 16 Inc ≙ 0,90mm "

} with 0,1mm paper thickn.

Technical data

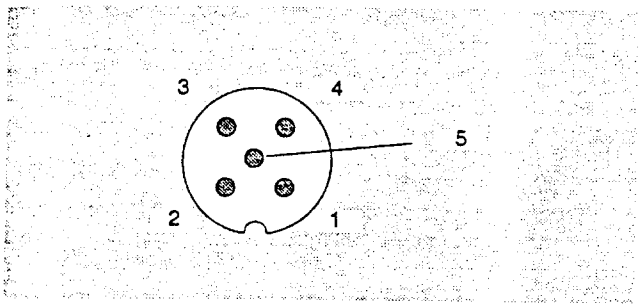
Motor data

- U = 24V DC
- P = 5W

Potentiometer data

- U = 10V DC
- R = 10KΩ

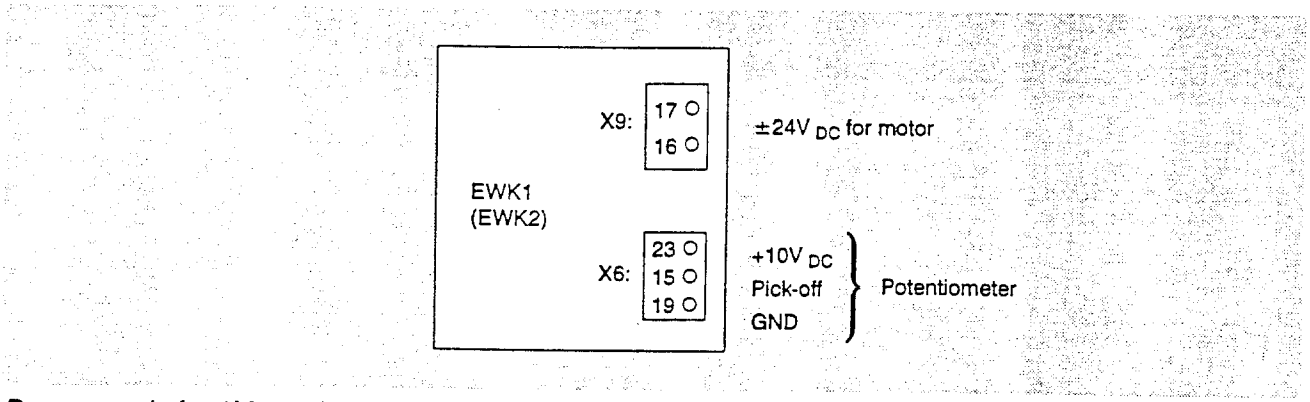
Pin assignment



Plug 1M3-X1 / 2M3-X1

Pin	Function
1, 2	24V DC (motor)
3	10V DC (potentiometer)
4	Potentiometer pick-off
5	GND potentiometer

Power supply



Power supply for 1M3 and 2M3

Technical data

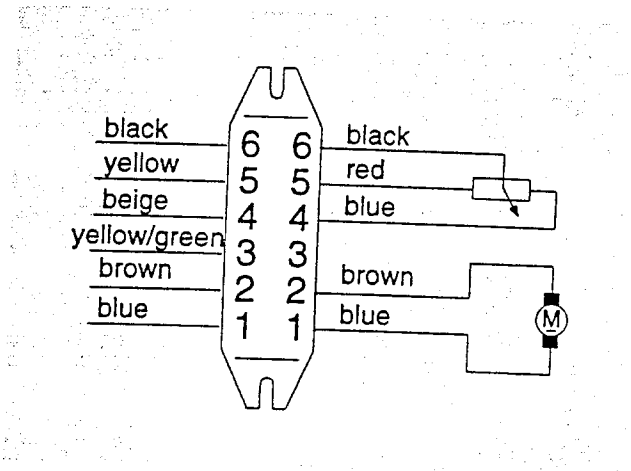
Motor data

- U = 12V DC

Potentiometer data

- U = 10 V DC
- R = 10KΩ

Terminal assignment



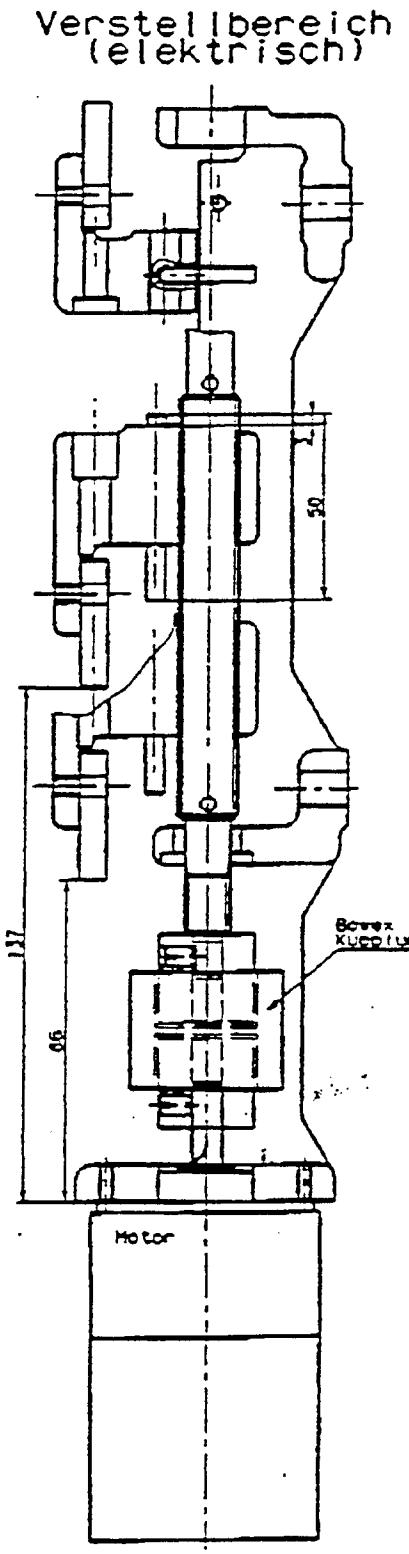
Terminal strip of servo-drive for circumferential register

Pin	Function
1, 2	12 V DC (motor)
4	10 V DC (potentiometer)
5	Ground potentiometer
6	Potentiometer pick-off

Grundeinstellung der Phasenverstellung (BAA) GTO-S

Verstellbereich (elektrisch)

- Inkremente	696 +/-4 bis 3214 +/-4
- Istanzeige (am Display)	-4 bis +16
- Abstand Unterkante Schlitten zur Unterkante Gehäuse	137 mm bis 86 mm
- Anzahl der Umdrehungen an der Spindel	25,5
- Verstellwinkel am Abtriebsrad	52,7°
- Verstellstrecke am Tischband	24,6 mm



Einstellvorgang der Phasenverstellung

1. Bowex-Kupplung (BAA) lösen und vom Motor trennen.
2. Motor auf +16 fahren (entspricht 3214 +/-4 Inkrementen).
3. Mechanik auf unteren Anschlag drehen.
4. 1 Umdrehung zurückdrehen.
5. Kupplung verbinden.
6. Bereich prüfen, von -4 bis +16 verfahren. (Der mech. Anschlag darf dabei nicht erreicht werden.)

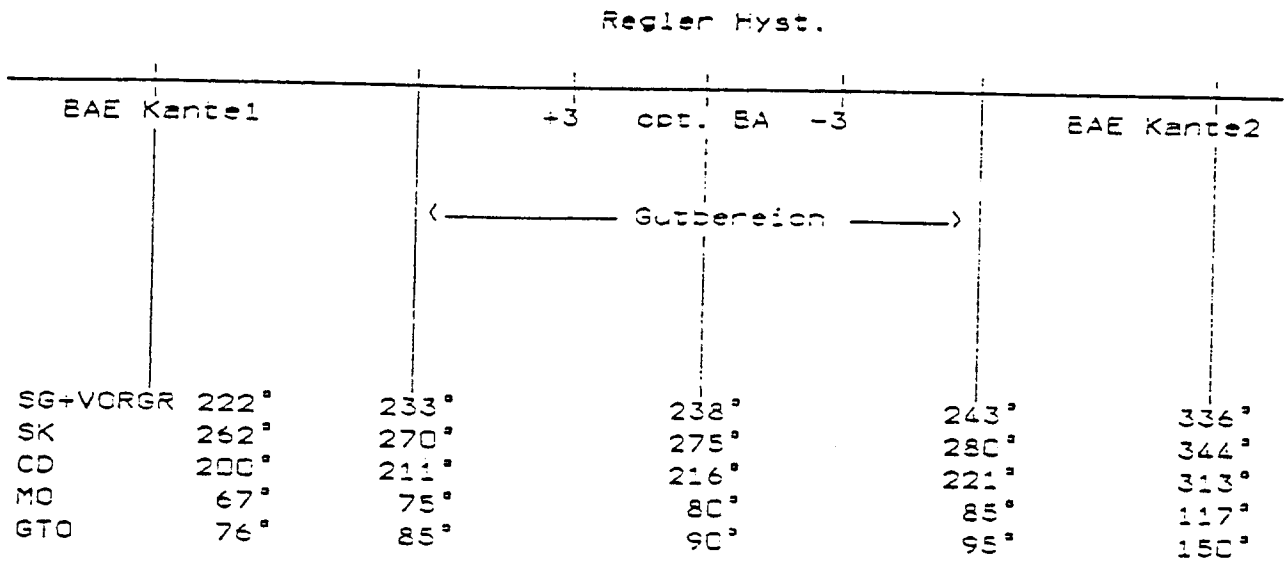
Grundeinstellung Anleger

1. Automatik aus (Anzeige am CP-Tronic-Pult: 0 entspricht 1200 Inkrementen).
2. Maschinenlauf (ohne Papier) mit 3000 Dr/h.
3. Papierlauf bis kurz vor die Vordermarken.
4. Auf 90° Maschinenwinkel vorwärtstippen.
5. Kettenrad-Kupplung verdrehen bis Bogen an die ANK ankommt. (Wird am Display angezeigt.)
6. Einstellung überprüfen: Tisch abräumen, neuer Papierlauf (mindestens 20 Bogen). Neuen Bogen in Richtung Vordermarke tippen, bei 90° +/-2° muß die ANK-Anzeige am Display aufleuchten.

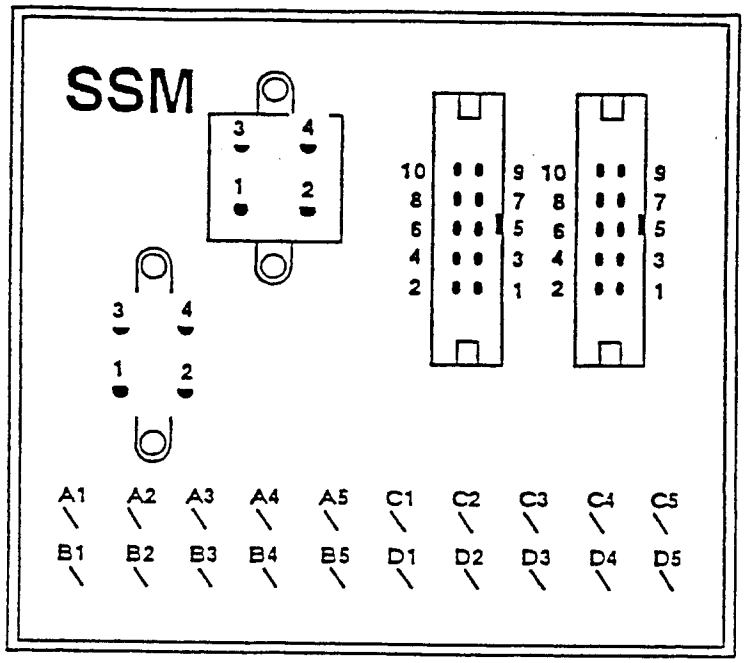
File a:BA.TX4

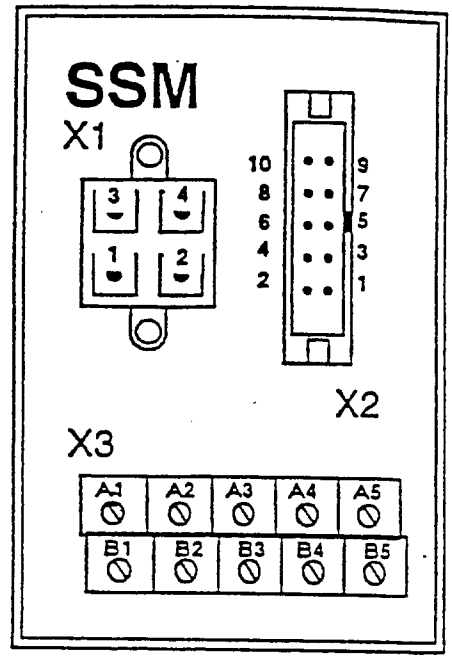
Stand: 12.09.90

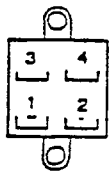
Grenzzahlen für Rosenankunft



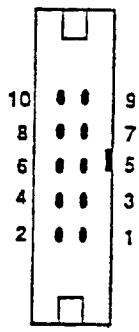
SG+VORGR	222°	233°	238°	243°	336°
SK	262°	270°	275°	280°	344°
CD	200°	211°	216°	221°	313°
MO	67°	75°	80°	85°	117°
GTO	76°	85°	90°	95°	150°







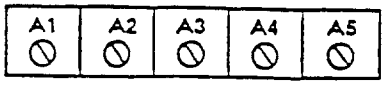
1 -> Motor 1 +
2 -> Motor 1 –
3 -> Motor 2 +
4 -> Motor 2 –



1 -> not used
2 -> not used
3 -> +10 Volt
4 -> Potentiometer voltage motor 1
5 -> Ground

6 -> Ground
7 -> Potentiometer voltage motor 2
8 -> +10 Volt
9 -> not used
10 -> not used

Input

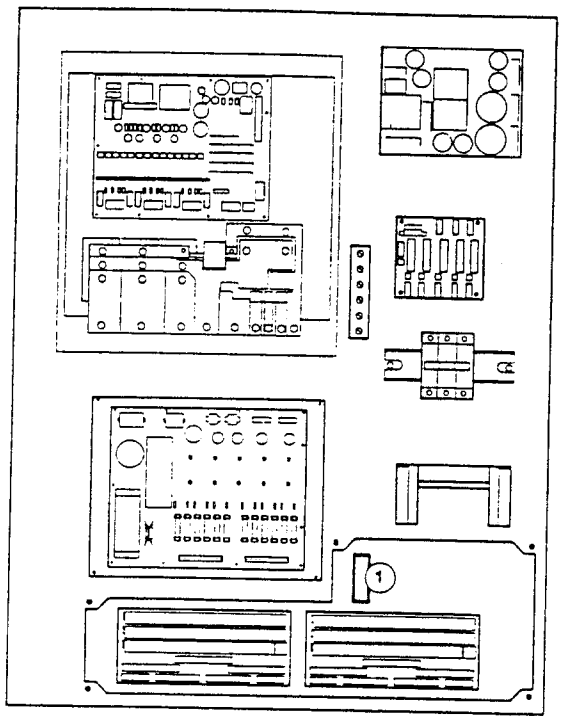


1 -> Motor +
2 -> Motor –
3 -> +10 Volt
4 -> Potentiometer voltage
5 -> Ground

Output

SUM6 Signal conversion module

Place of installation

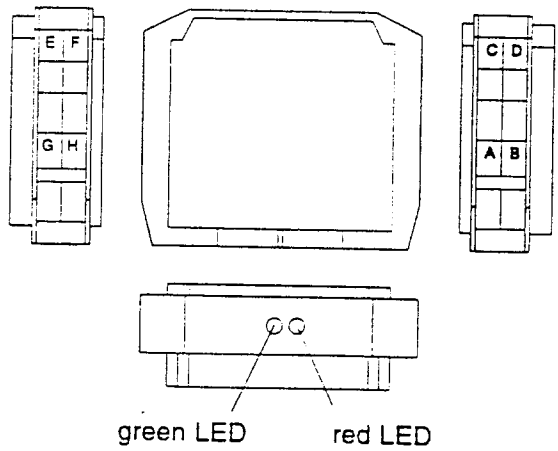


Place of installation SUM6

The signal conversion module SUM6 is fitted in the equipment zone B of the control cabinet.

① Signal conversion module SUM6

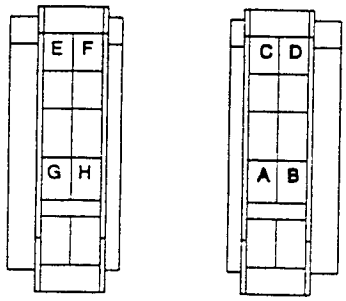
Task



Signal conversion module SUM6

The signal conversion module SUM6 combines different input signals. Two output signals of the SUM6 are available for the control.

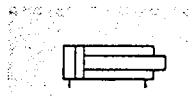
Terminal assignment



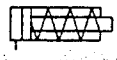
Terminals on the SUM6

Terminal	Function
A	Output signal Signal is generated from the linkage of terminal C, F and G.
B	Output signal Signal is generated from the linkage of terminal F and G.
C	Input signals
D	⊥ (Ground 24V)
E	24V DC
F	Input signal (red LED)
G	Input signal (green LED)
H	Not used

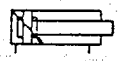
Pneumatic symbols



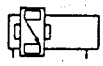
double-acting cylinder



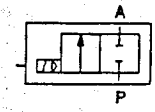
single-acting cylinder (return movement through built-in spring)



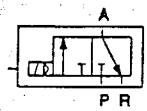
double-acting cylinder with damping adjustable on both ends



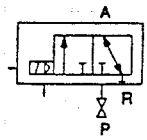
cylinder without piston rod



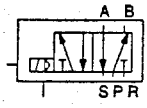
2/2-way-valve,
electrically actuated, pneumatically pilot-controlled



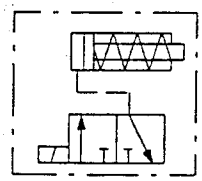
3/2-way-valve,
electrically actuated, pneumatically pilot-controlled



3/2-way-valve,
electrically actuated, pneumatically pilot-controlled

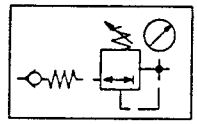


5/2-way-valve,
electrically actuated, pneumatically pilot-controlled

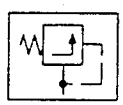


cylinder/valve unit with 3/2-way-valve, electrically actuated, and single-acting cylinder

adjustable non-return valve



pressure reducer with check valve

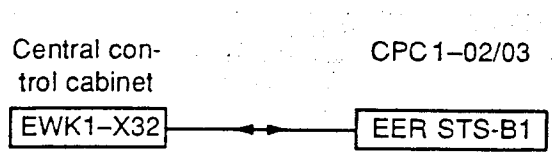


safety valve

Connection to CPC1

Connection to CPC1-02/03

Serial interface

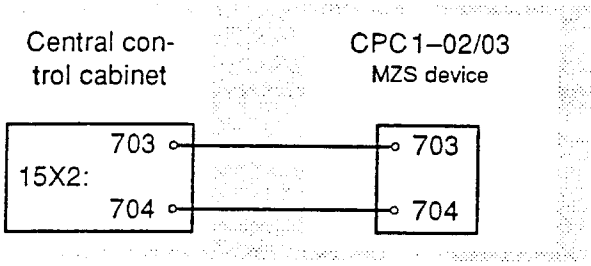


EER – Backplane of electronic plug-in unit

The control unit CPC1 and the CPTRONIC central control cabinet are connected with each other via a serial interface.

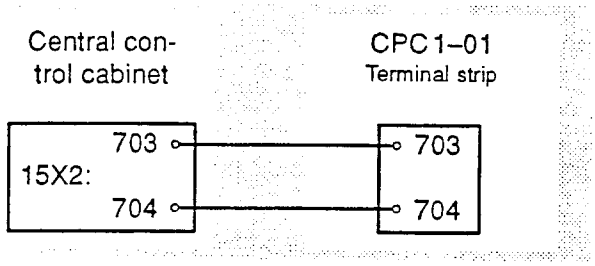
Via this interface changes in the press speed, colour allocation and water pan roller speed are transmitted to CPC1.

Signal "Press turns"

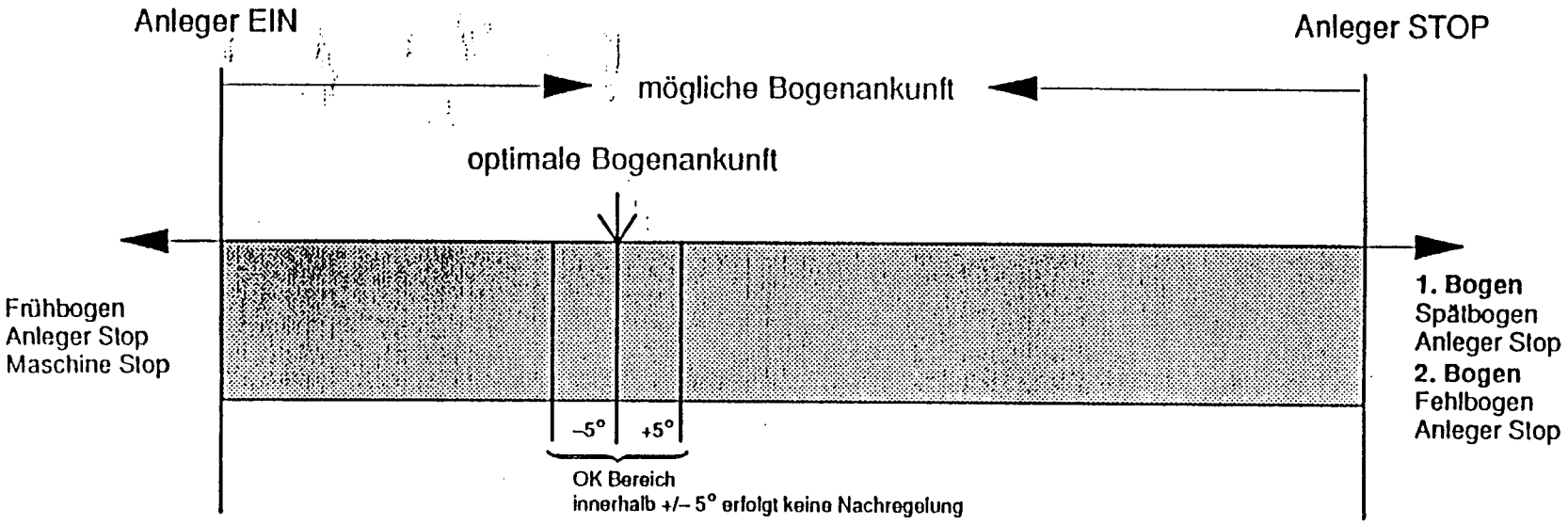


Connection to CPC1-01

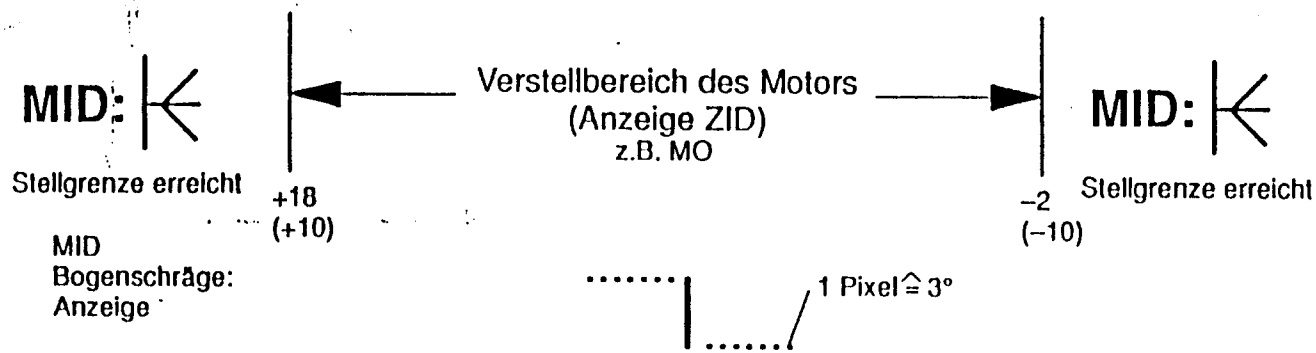
Signal "Press turns"



Bogenankunftsregelung

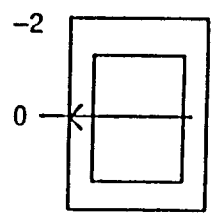


CD	200°	216°	313°	Verstellbereich ZID
SG+Vorgr.	222°	235°	336°	
SK	262°	275°	344°	
MO	67°	80°	117°	
GTO	76°	90°	150°	
SM74	285°	303°	30°	
SM102	192°	205°	336°	
SMCD102	170°	186°	313°	



ZID Anzeige Bogenschräge:

der Bogen ist -7° vom optimalen Zeitpunkt entfernt

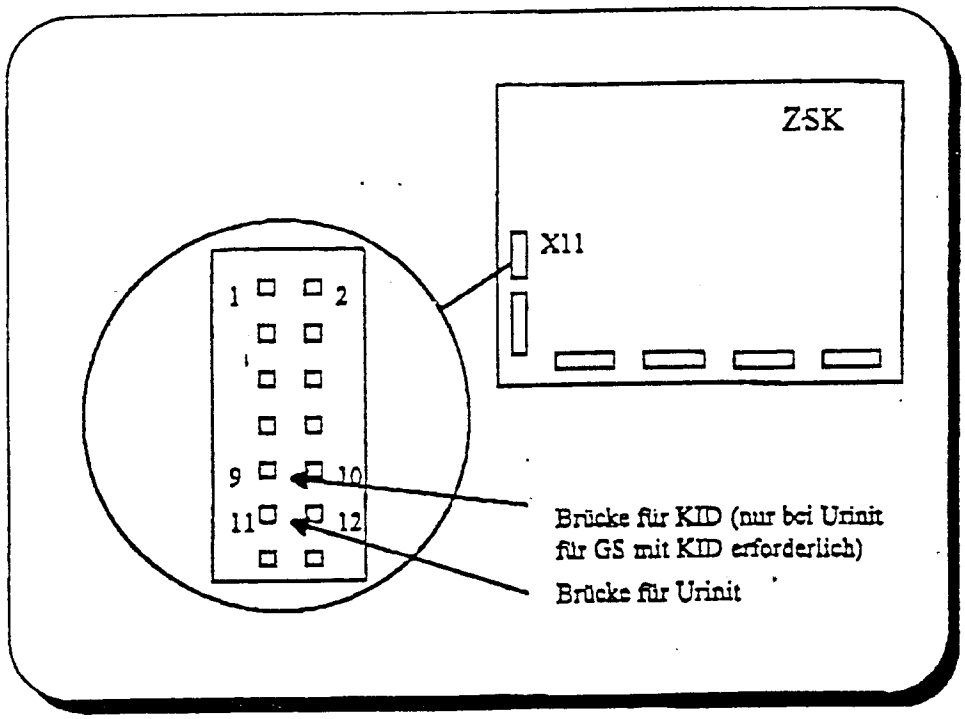


Verteiler:

Neuer Urinit für CPTcompact-Plattformen ab Software CPT103:

Stand bis dato:
Der Urinit wird durch Lösen des Steckers X13 auf der ZSK ausgelöst.

Änderung:
Der Urinit wird durch Kurzschließen der Pins 11 und 12 am Stecker X11 ausgelöst.
(siehe Bild)



26.01.1995 Schlindwein
system\dbank\plan.*; Tabelle Aufgaben.Dokumentation

Characteristics important for the electronic control system

Important:

Incorrect use of the variant code can result in serious malfunctions or damage to the press.

Position	Meaning	Value (letter or digit)	Symbol
011	Press model	2 4 6 G M N	SC (Speedmaster CD) SG (Speedmaster 102) SK (Speedmaster 72) GG (GTO) MO (M-Offset) MS (Speedmaster 74)
012	Number of printing and coating units	1.....9, A, B, C	1.....12
022	Sheet reversal between printing units 1 and 2	blank = without 1 = with	2
023	Sheet reversal between printing units 2 and 3	blank = without 1 = with	3
024	Sheet reversal between printing units 3 and 4	blank = without 1 = with	4
025	Sheet reversal between printing units 4 and 5	blank = without 1 = with	5
031	Type of printing unit	1 = offset unit 2 = numbering unit	O W
032	Type of printing or coating unit	blank = no unit 1 = offset unit 2 = numbering unit 3 = coating unit	O W L
033 to 03C	Type of printing or coating unit	blank = no unit 1 = offset unit 2 = numbering unit 3 = coating unit 4 = intermediate unit for dryer	O W L Y
061	Numbering	0 = without 1 = standard version 2 = normal 3 = Ø 68 mm (MOZ) 4 = Ø 120 mm (MOZ)	
071	Dampening	1 = vibrator-type 2 = continuous-type (Alcolor)	
075	Alcolor coating facility	0 = without 1 = last printing unit 2 = penultimate printing unit	(with position code) (with position code)

Position	Meaning	Value (letter or digit)	Symbol
077	Alcolor coating facility in front of sheet reversing device	0 = without 2 = in front of sheet reversing device 2 3 = in front of sheet reversing device 3 4 = in front of sheet reversing device 4	2 3 4
133	Maximum print format	0 = standard format 4 = 472 x 650 mm (Japanese format SM74)	片反月月
163	Multiplate	0 = without 1 = retrofitting with Multiplate possible 2 = with	
201	Type of feeder	1 = single-sheet 2 = ~~shingle~~ stream 3 = Preset	
222	Pull lay control	0 = without 1 = with	
231	Type of delivery	1 = normal 2 = extended	
232	Standard delivery High-pile delivery	1 2	
233	Non-stop delivery	1 = without 2 = rake 3 = board 4 = combination: rake and board	
293	Pressure control / pneumatic system in the press (solenoid valve for admission of pressure and pressure sensor)	0 = without 1 = with	

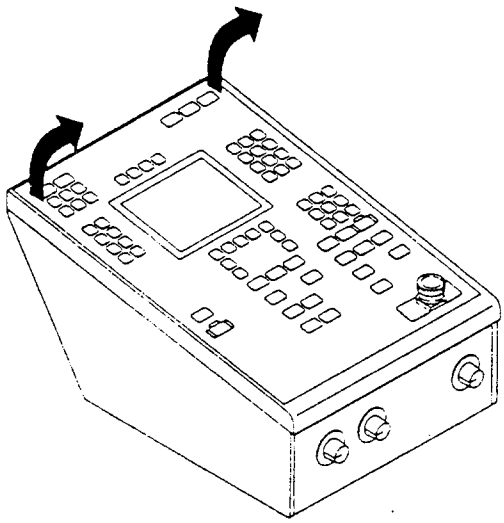
Variant code

Caution:

Incorrect use of the variant code may result in serious malfunctions or damage to the press.

Note:
The mentioned variants are examples which shall help you to understand the variant code.

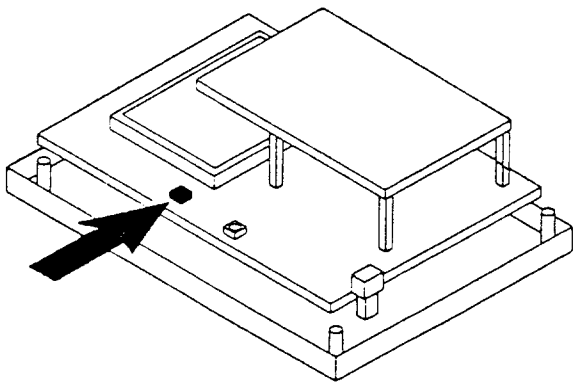
Entering the variant code in the KID



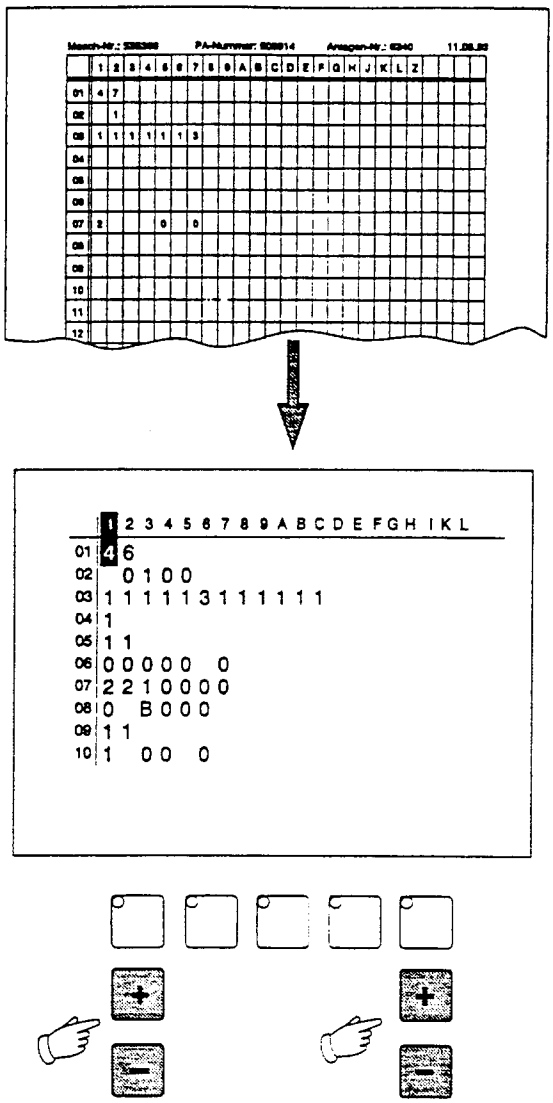
Compact control console

❶ Open the compact control console.

❷ Press the HDM pushbutton.



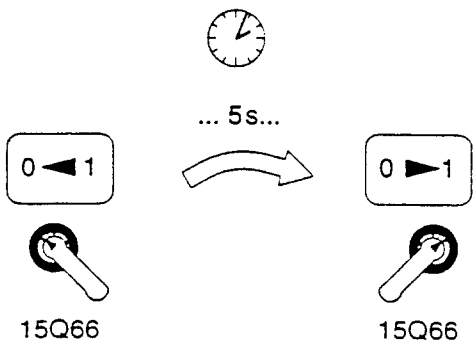
HDM pushbutton



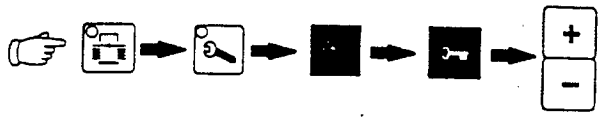
Input as per printout

❸ Move the cursor to the corresponding position with the right-hand ± buttons. Enter the value indicated in the printout with the left-hand ± buttons.

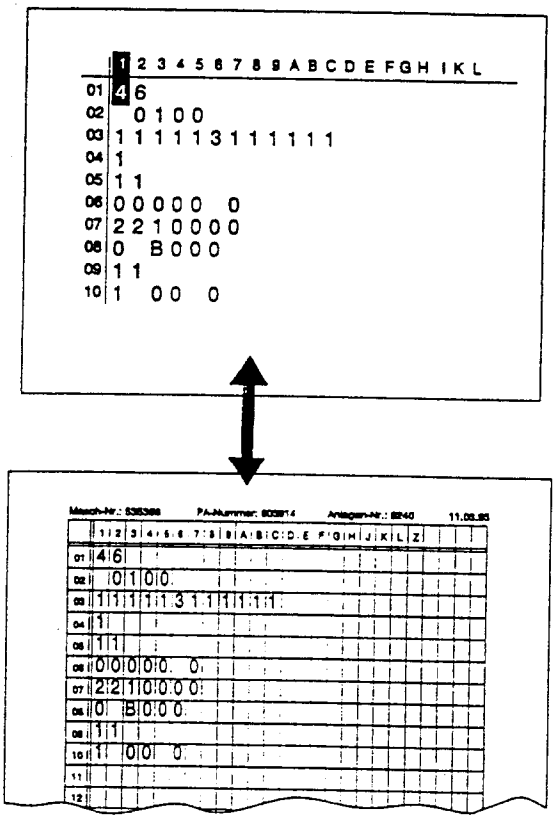
❹ Turn the main switch 15Q66 off and on again after 5 seconds.



Switching the press off and on

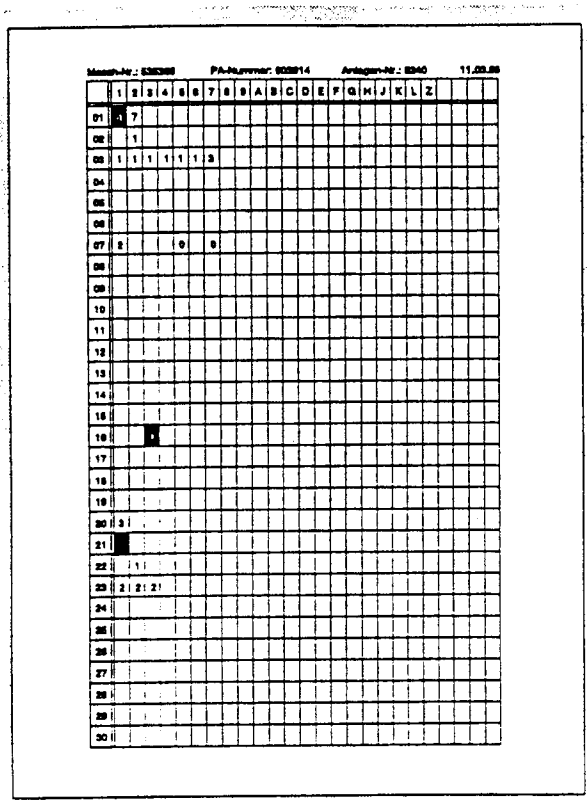


❺ Select the variant code and compare it with the printout.



Comparing the variant code with the printout

Additions to the printout



Example of a printout

The retrofitting of subassemblies may result in changes in the variant code. These changes must be added to the printout in order to ensure that the documented variant code always corresponds to the present state of the printing press.
You find the printout in the same place as the Manuals or in the power supply area of the control cabinet.

Verwendung der INIT - und DYN-TEST Listen für Kompaktelektronik

Teilweise können die Listen der Modularelektronik auch für Kompaktelektronik benutzt werden.Es gibt im Moment keine andere Möglichkeit.

INIT TEST:

kompakt:	modular:
ZSK	---------
EWK	---------
DSK	DSK
EAM	---------
ZSK A-DRV	MSK
KVT	KVT
TTK	TTK
BLT_CON	BLT_CON
MID 11	MID 11
MID 12	MID 12
PUD	PUD
FDK	FDK
H00X	---------
S00X	---------

DYN TEST:

HWI	HWI
COM S/A	SPK/SAK
ZSK A-CRV (CTR)	REK 1
MOT	MOT

Init Test 1 Brushless Drive as of SW 5.2

BLT :	X					X					X					X				
CON		1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1
0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0	0	0		1	0	0	0		1	0	0	0		1	0	0	0	
2		0	0		0	2	0	0		0	2	0	0		0	2	0	0		0
3		0	0			3	0	0			3	0	0			3	0	0		
4		0		0	0	4	0		0	0	4	0		0	0	4	0		0	0
5		0		0		5	0		0		5	0		0		5	0		0	
6		0			0	6	0			0	6	0			0	6	0			0
7		0				7	0				7	0				7	0			
8			0	0	0	8		0	0	0	8		0	0	0	8		0	0	0
9			0	0		9		0	0		9		0	0		9		0	0	
A			0		0	A		0		0	A		0		0	A		0		0
B			0			B		0			B		0			B		0		
C				0	0	C			0	0	C			0	0	C			0	0
D				0		D			0		D			0		D			0	
E					0	E				0	E				0	E				0
F						F					F					F				
		MSK/TTK detective	not used	not used	Voltage override on 250VDC>330V Or 48VDC>56V (if 250V > 310V the main drive is not further more enabled, it during operation 250>345V code appears(has to be because of generatorwise slow down). If 48 V > 56V brake is not furthermore enabled, if 48V> 70 while machine is running => error occurs and machine is switched off	not used	Armature current can not be established	Short circuited armature lines have been detected	Short circuit to earth from one or both armature supply lines	not used	Motor temperature > 150 C (Temperature line interrupted)	Motor encoder line is interrupted check plug)	Code for motor is not available (should be for example 26)	Voltage of 48 V DC line is to low (limit = < 39 V) (when machine is not turning the error code occurs already if 48< 35V then maindrive is not furthermore enabled)	Voltage of 250 C DC line is to low (limit =< 185V)	not used	not used

Possible reasons for code appearance
(own experiences)

Init Test 11 Kühl– und Umwälzgerät

FEU1 : X X X X

0-F	1	1	1	1	0-F	1	1	1	1	0-F	1	1	1	1	0-F	1	1	1	1
	nicht benutzt	nicht benutzt	nicht benutzt	nicht benutzt		nicht benutzt	nicht benutzt	nicht benutzt	nicht benutzt		Steckverbindung ?? ist nicht OK OK	Das Gerät befindet sich im manuellen Betrieb	Fehler bei Temperatur– oder Alkoholgehalt Messung	Service / Test Modus ist eingeschaltet		Fehler im Kühlkreislauf, oder Filter verschmutzt oder Füllstand im Rückhaltebehälter zu gering, oder Störung im Wasserkreislauf	Motorschutzschalter für Umwälzpumpe hat ausgelöst	Alkohol Gehalt, oder Wischwasserzusatz– Gehalt nicht ausreichend	Störung im Kühlgerät ????
																????			

Mögliche Störungsursache (eigene Erfahrungen)

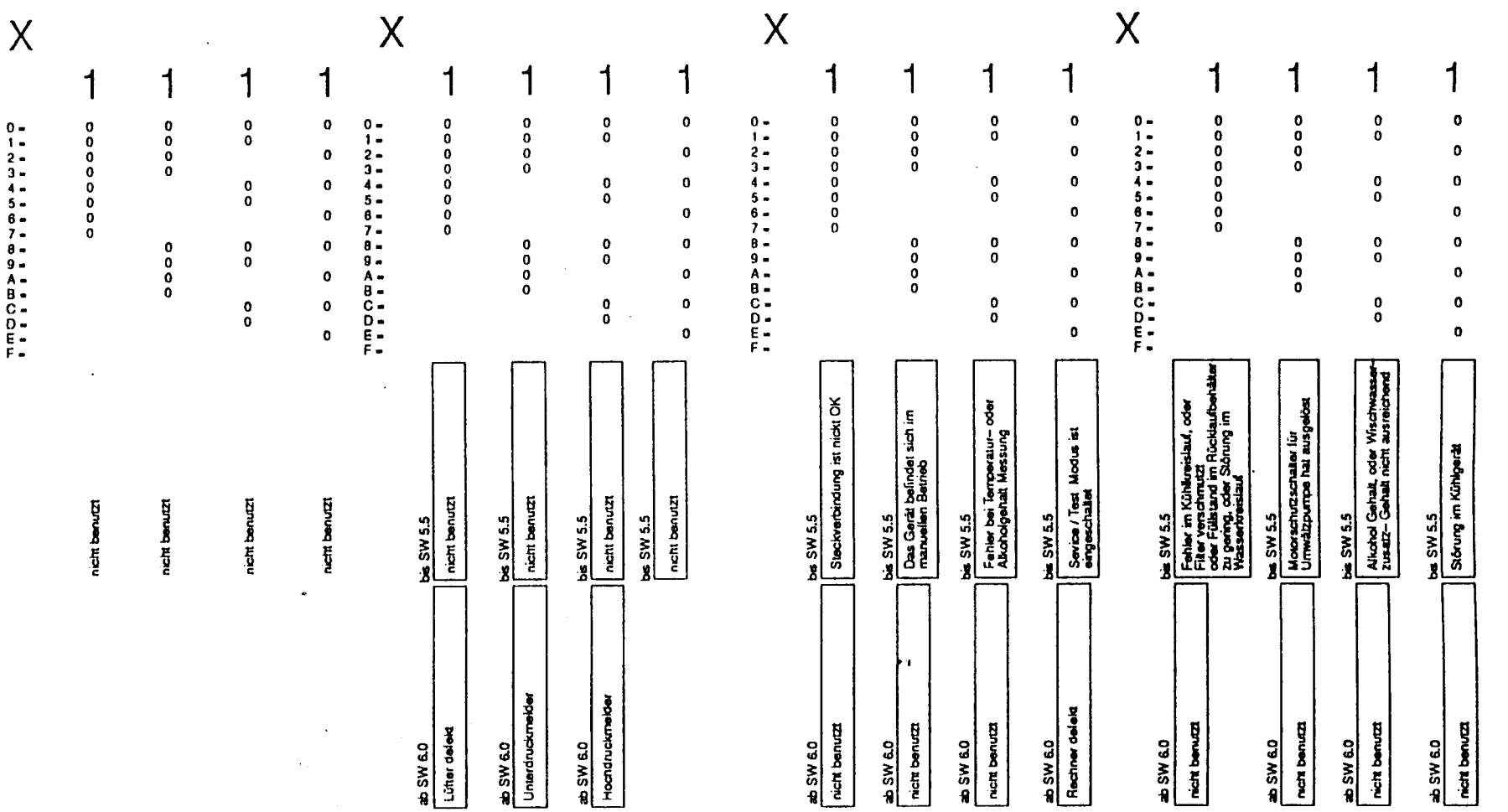
Init Test 11

PUD : X X X X

	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1
0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0
1-	0	0	0		1-	0	0	0		1-	0	0	0		1-	0	0	0	
2-	0	0		0	2-	0	0		0	2-	0	0		0	2-	0	0		0
3-	0	0			3-	0	0			3-	0	0			3-	0	0		
4-	0		0	0	4-	0		0	0	4-	0		0	0	4-	0		0	0
5-	0		0		5-	0		0		5-	0		0		5-	0		0	
6-	0			0	6-	0			0	6-	0			0	6-	0			0
7-	0				7-	0				7-	0				7-	0			
8-		0	0	0	8-		0	0	0	8-		0	0	0	8-		0	0	0
9-		0	0		9-		0	0		9-		0	0		9-		0	0	
A-		0		0	A-		0		0	A-		0		0	A-		0		0
B-		0			B-		0			B-		0			B-		0		
C-			0	0	C-			0	0	C-			0	0	C-			0	0
D-			0		D-			0		D-			0		D-			0	
E-				0	E-				0	E-				0	E-				0
F-					F-					F-					F-				
	not used	not used	not used	not used		not used	not used	not used	not used		not used	not used	not used	not used		not used	not used	Powder spray communication computer is not working	Powder Spray control computer is not working

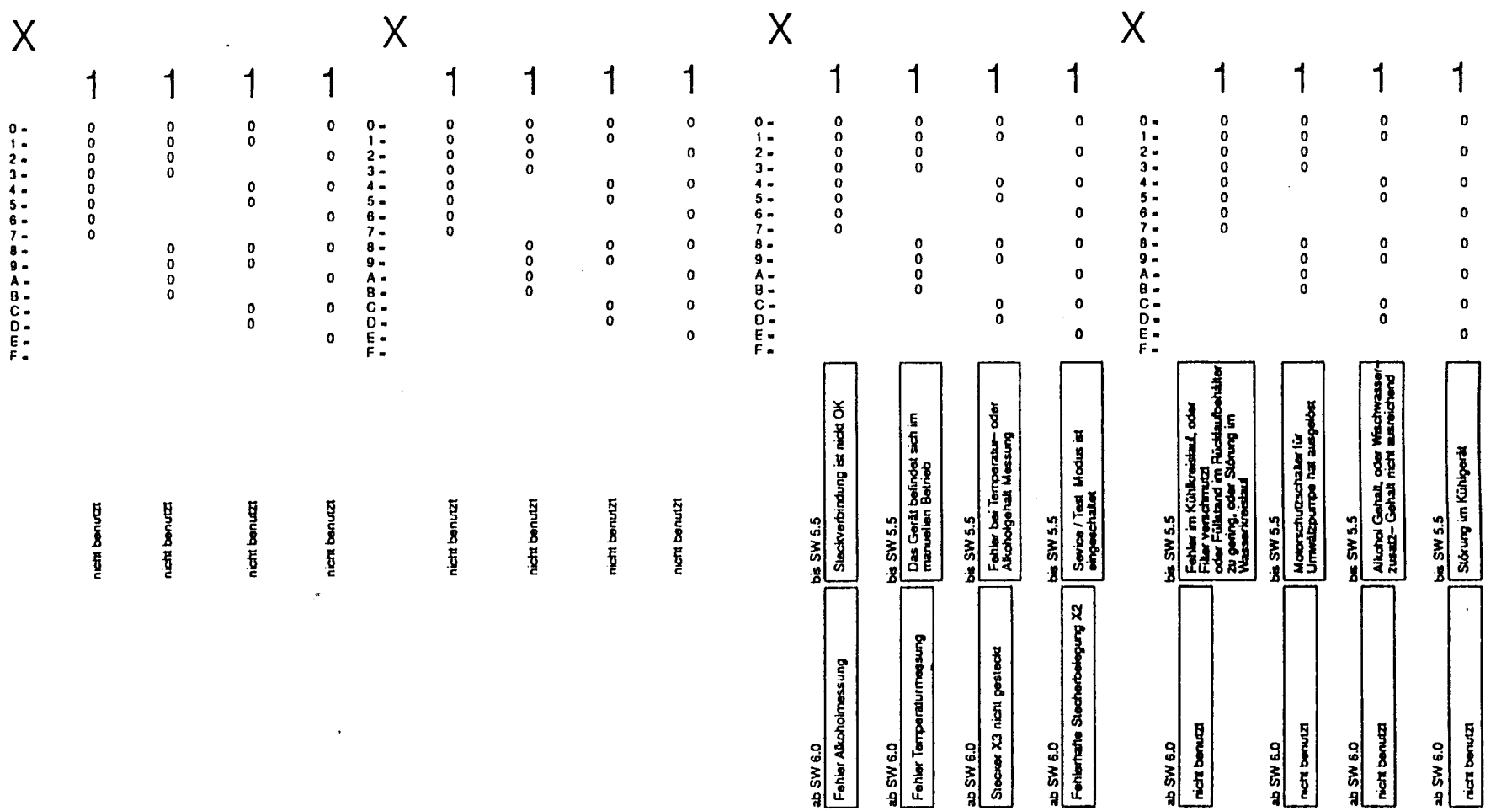
Possible reasons for code appearance
(own experiences)

Init Test 11 Kühl– und Umwälzgerät Technotrans FKC 2/4/6



Mögliche Störungsursache
(eigene Erfahrungen)

Init Test 11 Kühl– und Umwälzgerät Baldwin RCWL 821 –200/275



Init Test 1 Brushless Drive as of SW 5.2

TTK : X X X X

	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1
0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0
1-	0	0	0		1-	0	0	0		1-	0	0	0		1-	0	0	0	
2-	0	0		0	2-	0	0		0	2-	0	0		0	2-	0	0		0
3-	0	0			3-	0	0			3-	0	0			3-	0	0		
4-	0		0	0	4-	0		0	0	4-	0		0	0	4-	0		0	0
5-	0		0		5-	0		0		5-	0		0		5-	0		0	
6-	0			0	6-	0			0	6-	0			0	6-	0			0
7-	0				7-	0				7-	0				7-	0			
8-		0	0	0	8-		0	0	0	8-		0	0	0	8-		0	0	0
9-		0	0		9-		0	0		9-		0	0		9-		0	0	
A-		0		0	A-		0		0	A-		0		0	A-		0		0
B-		0			B-		0			B-		0			B-		0		
C-			0	0	C-			0	0	C-			0	0	C-			0	0
D-			0		D-			0		D-			0		D-			0	
E-				0	E-				0	E-				0	E-				0
F-					F-					F-					F-				
	not used	not used	not used	notused		not used	not used	not used	not used		not used	not used	Test for electronic supply votages failed (limits: 12VDC < 11.2V, 5V< 3.6V)	Test for brake energizing circuit failed (It is monotored whether the switching transistor can be switched, error occurs when short circuited)		not used	TTK identification code is not available (valid is for example 06)	TTK is defective	Interface between MSK and TTK is defective (Power supply cable ?)

Possible reasons for code appearance
(own experiences)

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ELECTRONICS TRAINING COURSE

RSC - Bangkok / Futterlieb

Unit RSK_DRV

Communication Dual Port RAM
Poiled

3F013 = 04

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RSG - Bangkok / Fulterlieb

UNIT TTK

error control voltage
message 42

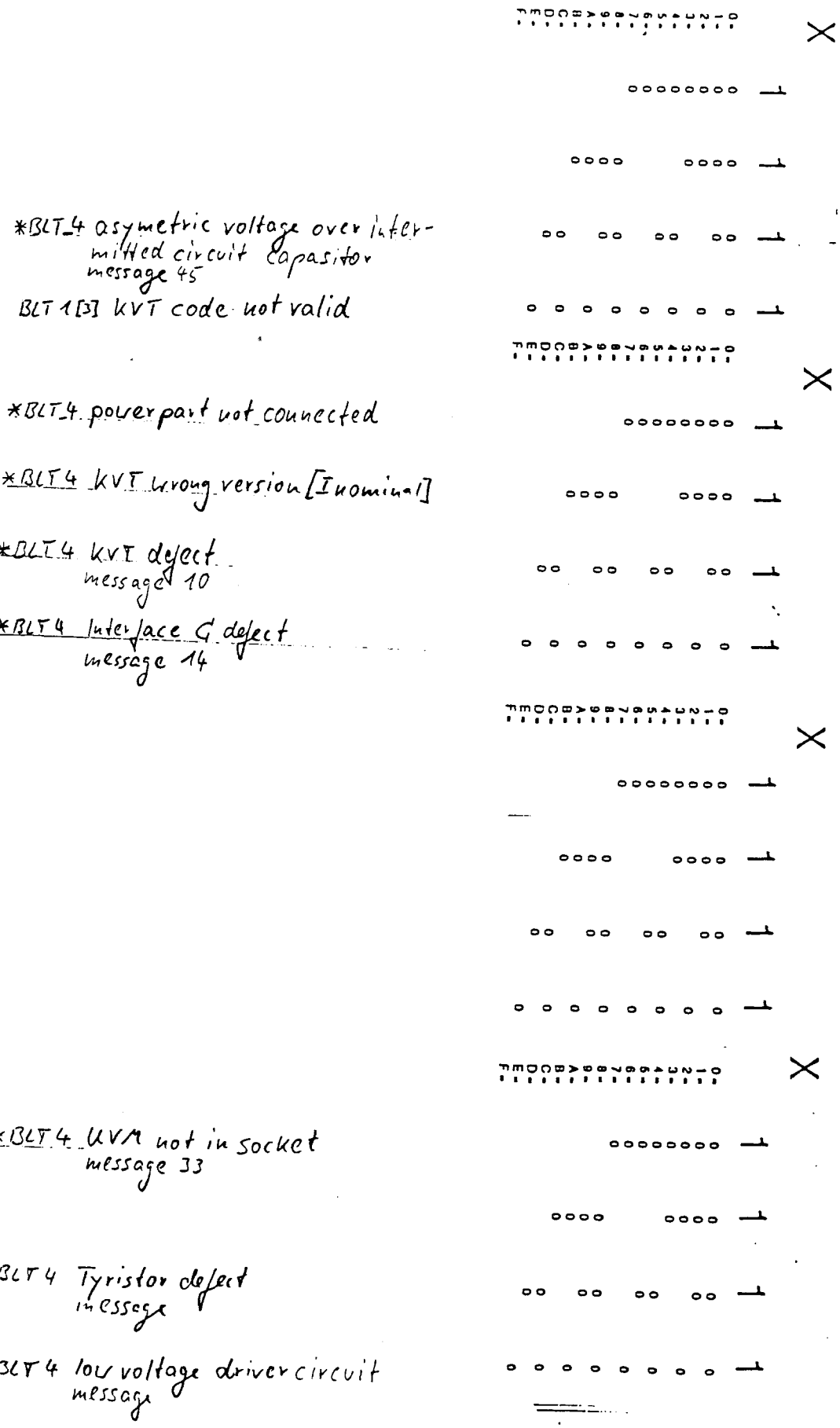
broke transistor error
message 41

TTK version wrong [Inominal]

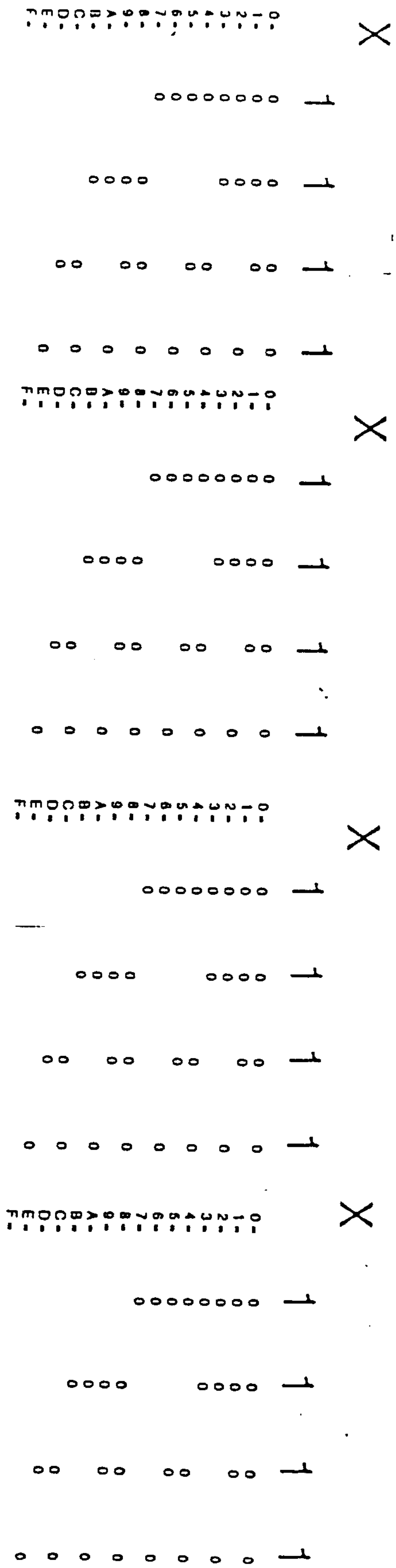
TTK code not valid

plug X1 defect

INIT KVT


*BLT_4 asymetric voltage over intermitted circuit Capasitor message 45
BLT 1[3] KVT code not valid
*BLT_4 powerpart not connected
*BLT 4 KVT wrong version [Inominal]
*BLT 4 KVT defect message 10
*BLT 4 Interface G defect message 14
*BLT 4 UVR not in socket message 33
*BLT 4 Tyristor defect message
*BLT 4 low voltage driver circuit message

INIT BLT_CON



*BLT 4 BLT 4 defect
BLT 1 temp sensor, commutation
48V error [<39V]

*BLT 4 Diagnostic not possible
message 28

*BLT 1 overvoltage 250V/48V
message 34 & 3 v 4

*BLT 4 code error [Combination]

*BLT 4 motorcoil connection
message 8

*BLT 4 motorcoil shorted
message 7

*BLT 4 motorcoil earth leakage
message 31

* motor wrong version [Inom]

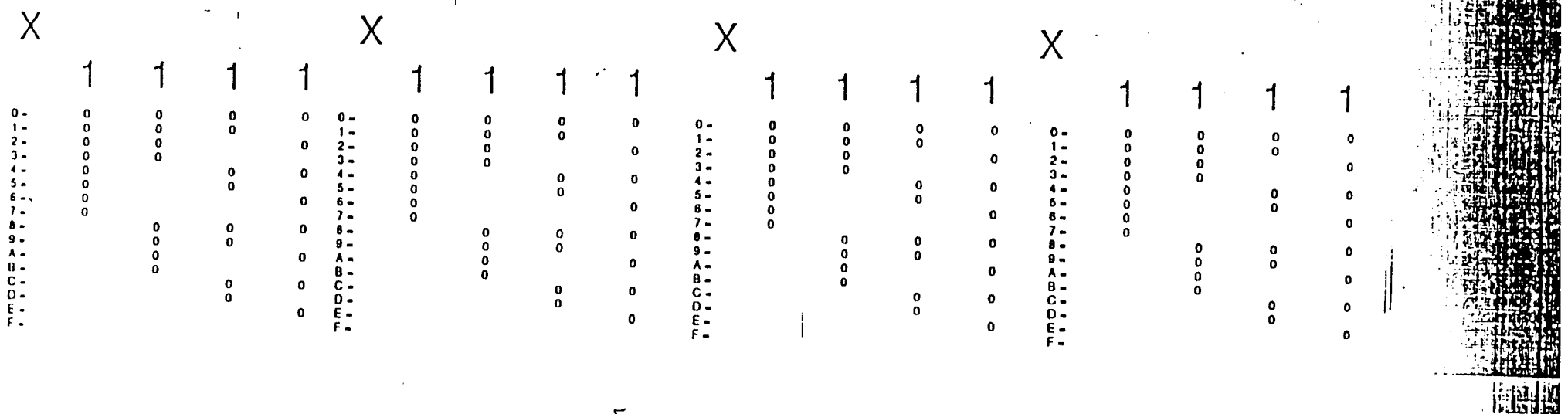
motor temp resistor
connection

motor tacho
message 43

motor code not valid for
BLT

48VDC low
message 4

250VDC low
message 3



Kommunication Dual Port RAM failed

Init ZSK-DRV

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RSG - Bang kok / Futterlieb

INIT TTK

plug X1 defect

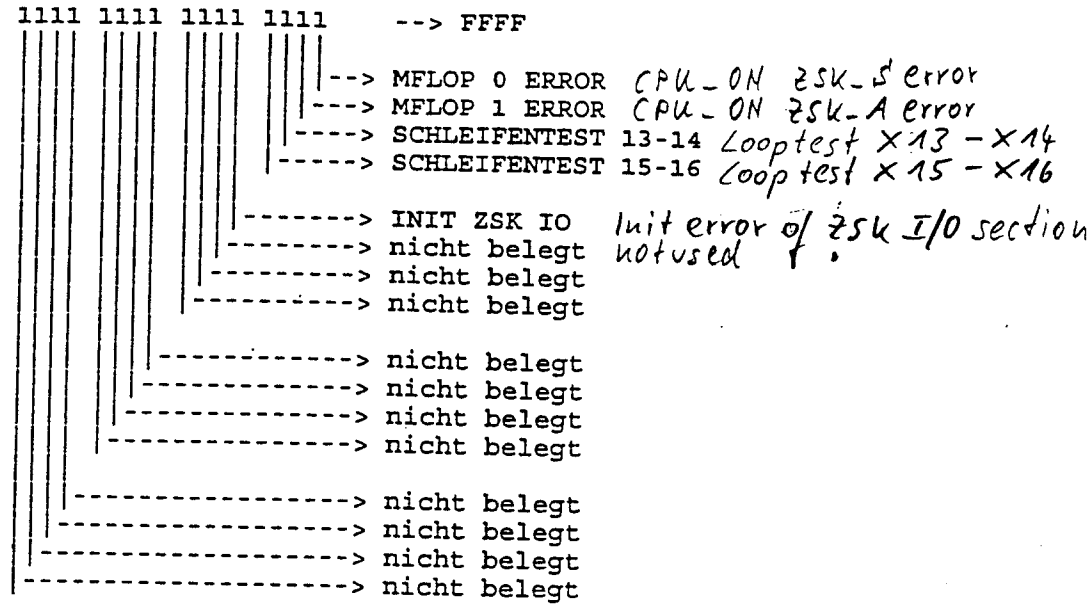
TTK code not valid

TTK version wrong [Inominal]

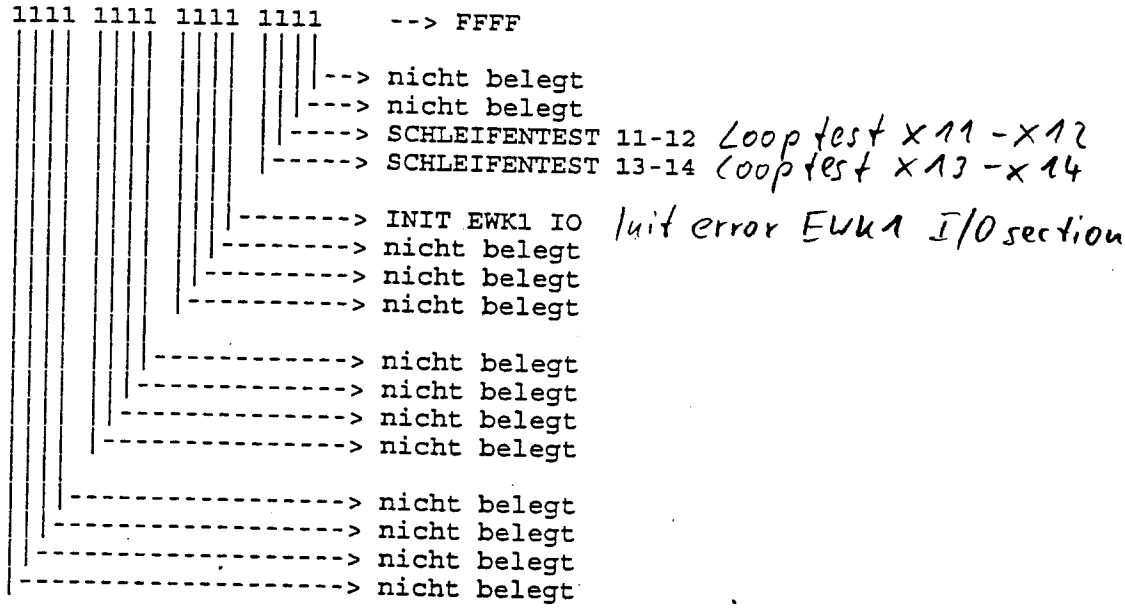
broke transistor error message 42

error control voltage message 42

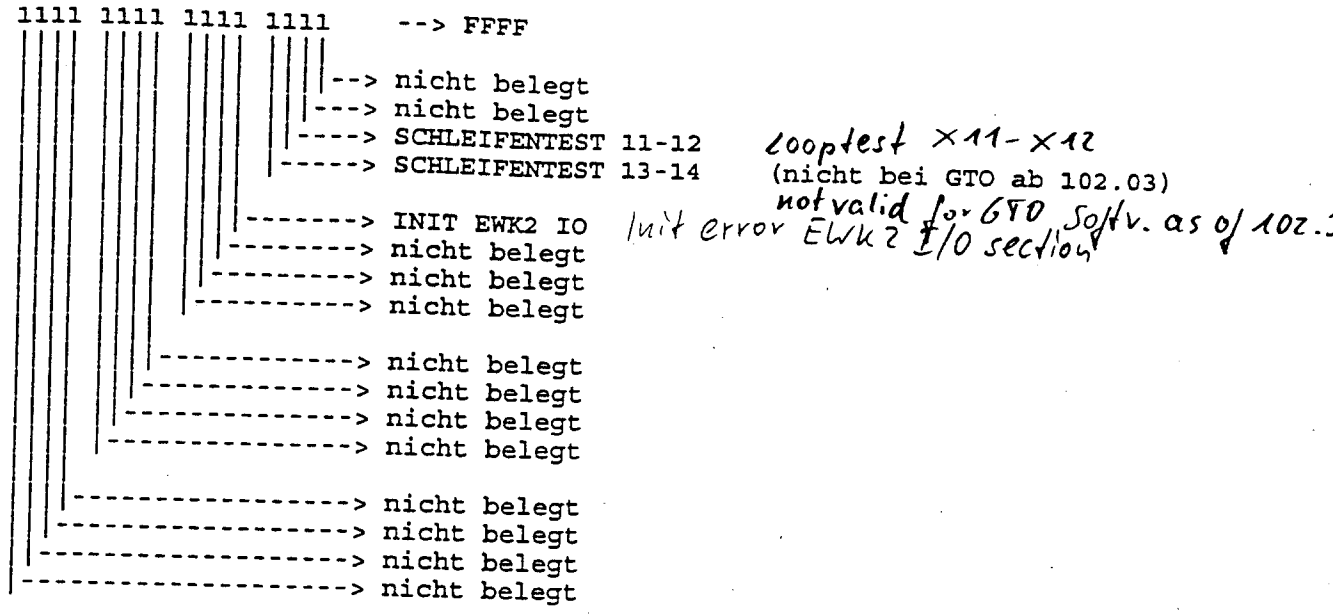
INIT-TEST-1 ZSK



INIT-TEST-1 EWK1

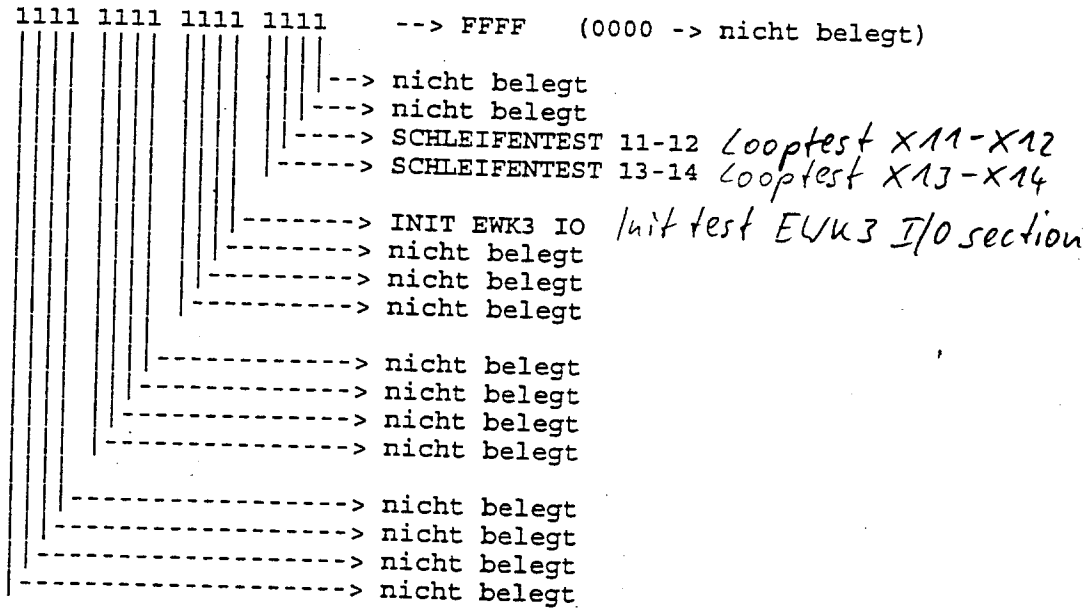


INIT-TEST-1 EWK2



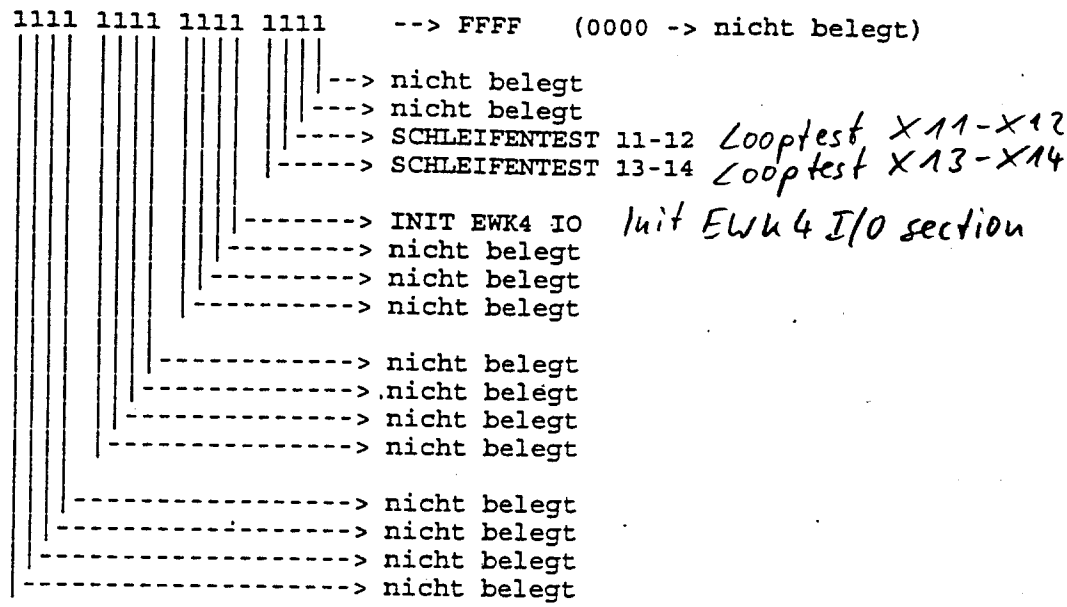
Looptest X11-X12
(nicht bei GTO ab 102.03)
not valid for GTO Softv. as of 102.3
Init error EWK2 I/O section

INIT-TEST-1 EWK3



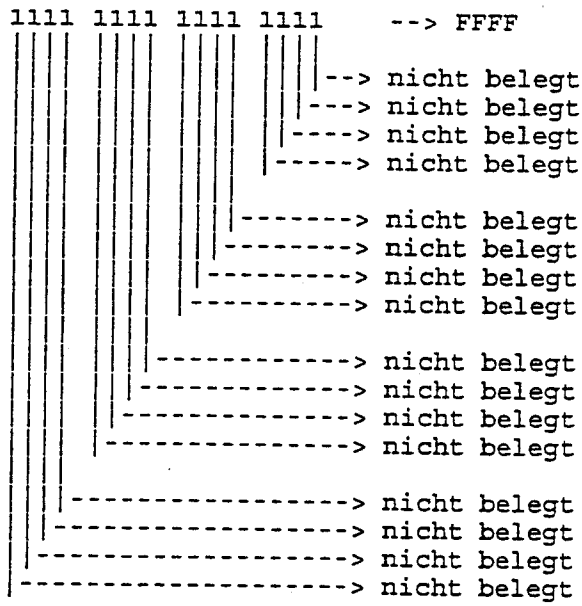
Looptest X11-X12
Looptest X13-X14
Init test EWK3 I/O section

INIT-TEST-1 EWK4

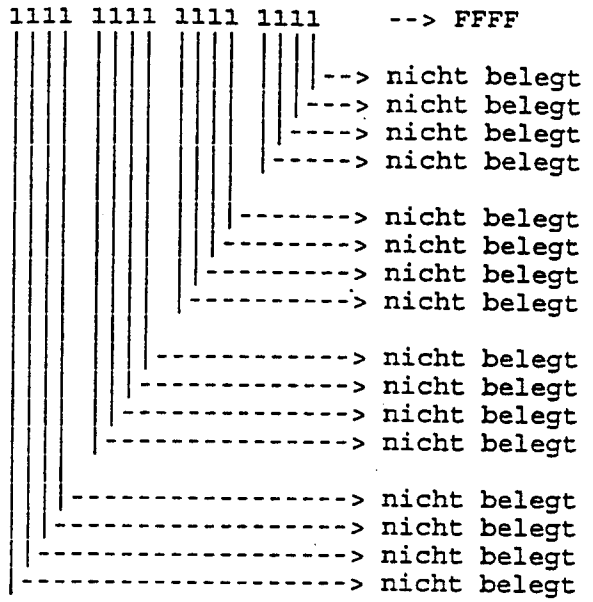


Looptest X11-X12
Looptest X13-X14
Init EWK4 I/O section

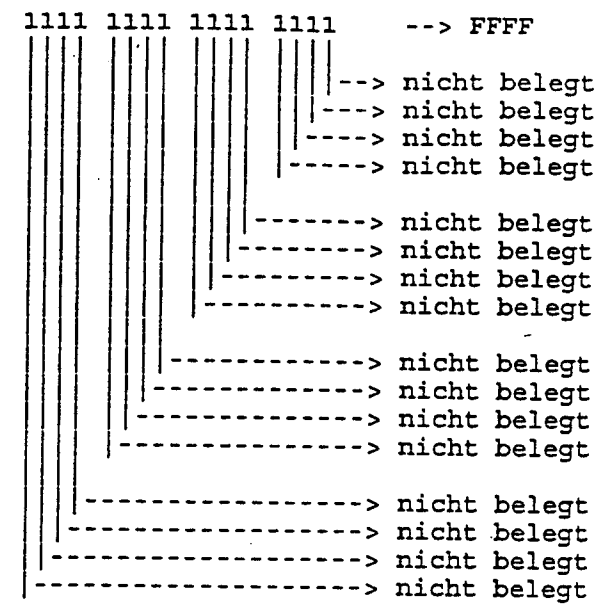
INIT-TEST-1 DSK



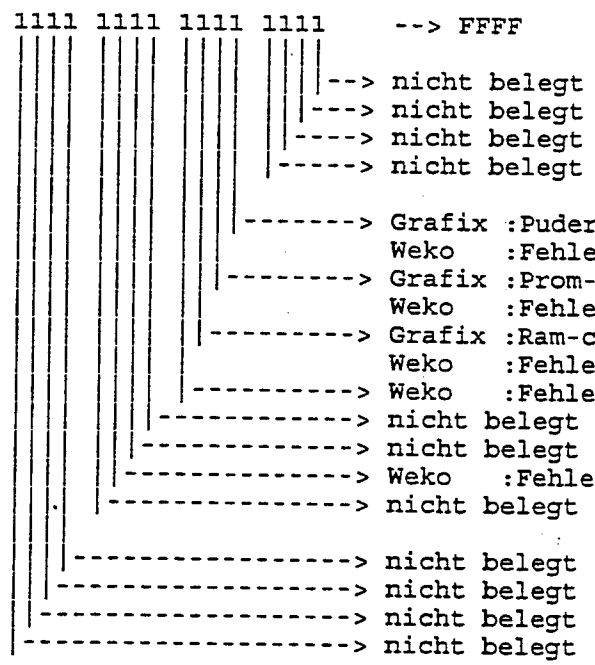
INIT-TEST-3 MID_11



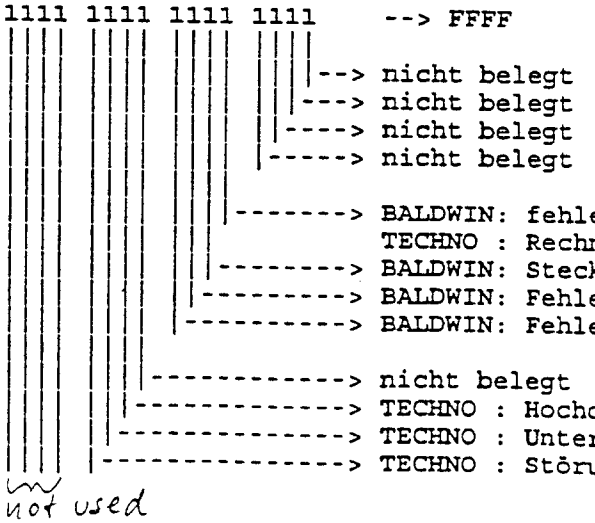
INIT-TEST-3 MID_12



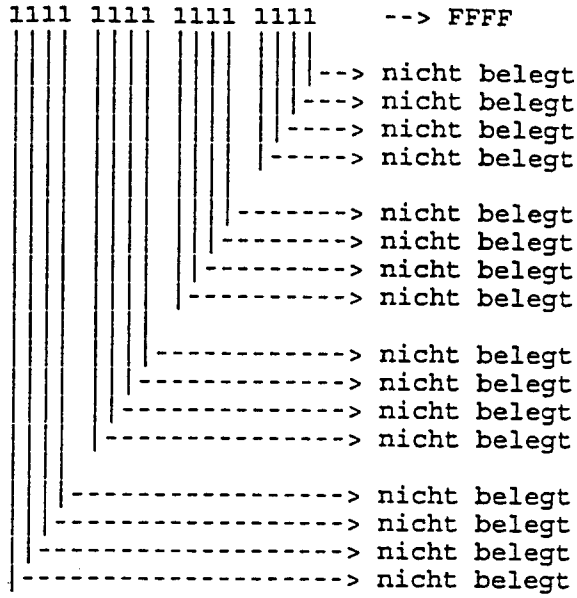
INIT-TEST-3 PUD



INIT-TEST-3 FEU

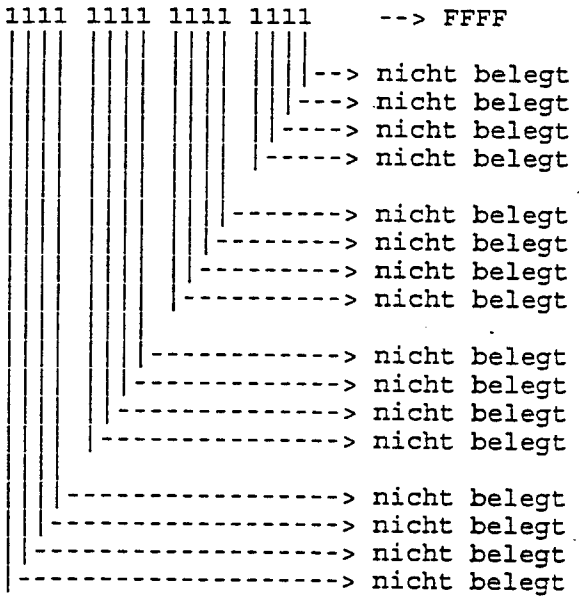


INIT-TEST-3 FDK

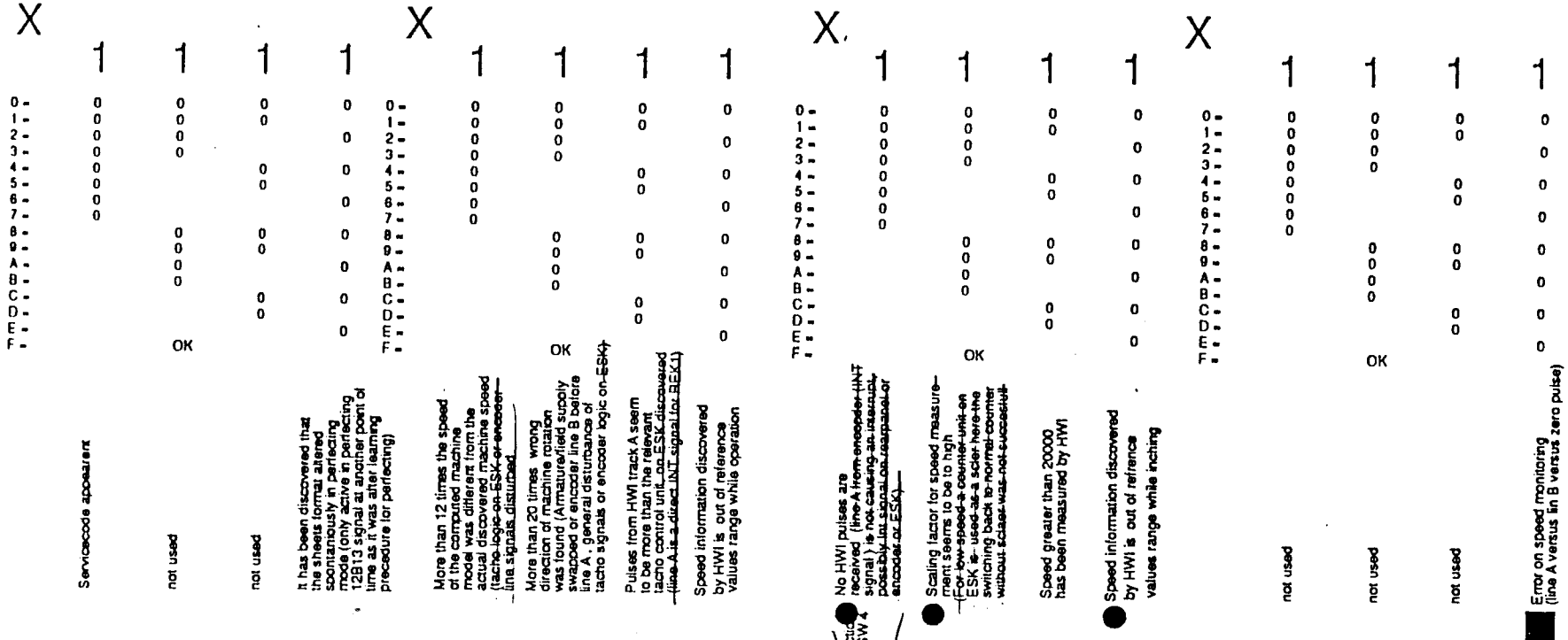


INIT-TEST-4 ,-5, -6 und -7 (INFO -> R.Spilger Tel.: 7869)

Hilfsantriebe 0 ... 119

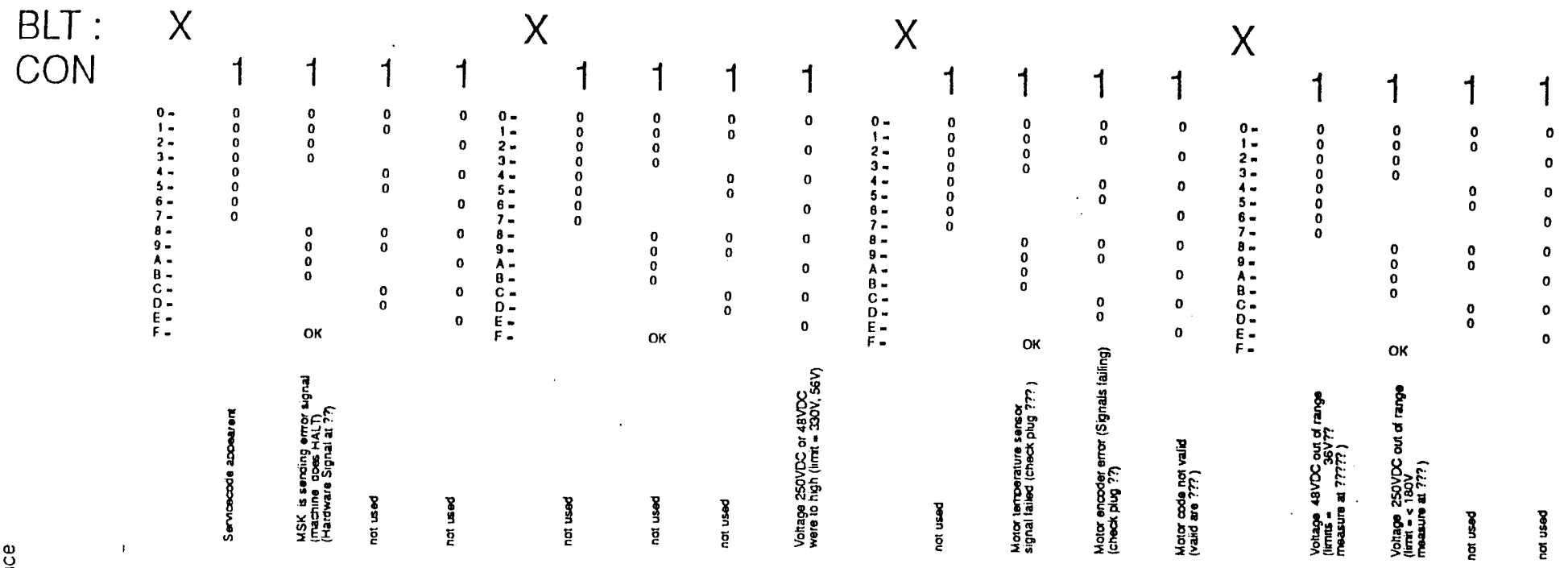


Dyn Test 1



Possible reasons for code appearance
(own experiences)

Dyn Test 1 Brushless Drive as of SW 5.2



Possible reasons for code appearance
(own experiences)

Dyn Test 1 Brushless Drive as of SW 5.2

MOT : X

	1	1	1	1
0	0	0	0	0
1	0	0	0	
2	0	0		0
3	0	0		
4	0		0	0
5	0		0	
6	0			0
7	0			
8		0	0	0
9		0	0	
A		0		0
B		0		
C			0	0
D			0	
E				0
F		OK		
	Servicecode appears!	not used	not used	not used

X

	1	1	1	1
0	0	0	0	0
1	0	0	0	
2	0	0		0
3	0	0		
4	0		0	0
5	0		0	
6	0			0
7	0			
8		0	0	0
9		0	0	
A		0		0
B		0		
C			0	0
D			0	
E				0
F		OK		
	not used	Warning : motor temperature reached 140 centigrade	Warning : in brake test the machine moved more than 4 degrees	MSK detected that motor is not turning (moment of inertia)

X

	1	1	1	1
0	0	0	0	0
1	0	0	0	
2	0	0		0
3	0	0		
4	0		0	0
5	0		0	
6	0			0
7	0			
8		0	0	0
9		0	0	
A		0		0
B		0		
C			0	0
D			0	
E				0
F		OK		
	Motor speed is not in valid range	Motor speed out of range, when brake test is done	REK1 detects machine is not turning via HWI information	Armature current was not reaching reference value while break test was done (90% of motors nominal current.)

X

	1	1	1	1
0	0	0	0	0
1	0	0	0	
2	0	0		0
3	0	0		
4	0		0	0
5	0		0	
6	0			0
7	0			
8		0	0	0
9		0	0	
A		0		0
B		0		
C			0	0
D			0	
E				0
F		OK		
	Machine was turning while brake test was done	not used	Speed of motor is out of range (check belt)	Wrong rotation direction of motor has been discovered

Possible reasons for code appearance
(own experiences)

Dyn Test 11

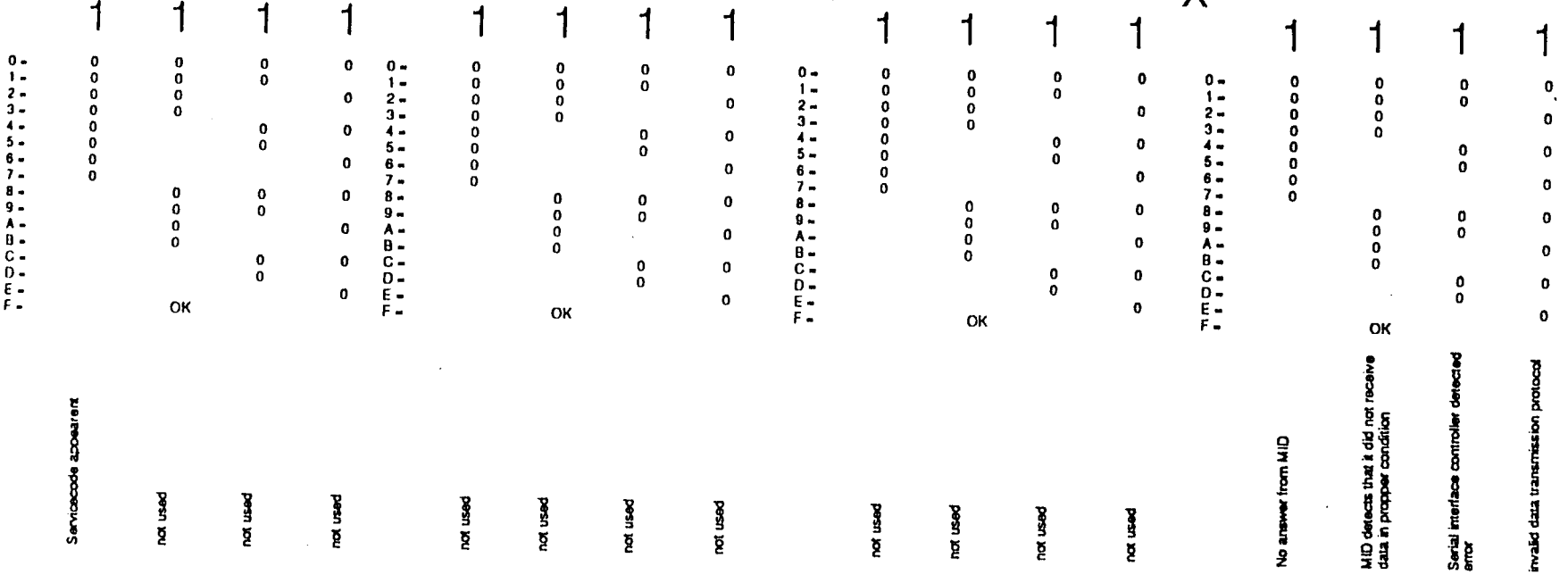
DSK : X X X X

	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1
0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0	0-	0	0	0	0
1-	0	0	0		1-	0	0	0		1-	0	0	0		1-	0	0	0	
2-	0	0		0	2-	0	0		0	2-	0	0		0	2-	0	0		0
3-	0	0			3-	0	0			3-	0	0			3-	0	0		
4-	0		0	0	4-	0		0	0	4-	0		0	0	4-	0		0	0
5-	0		0		5-	0		0		5-	0		0		5-	0		0	
6-	0			0	6-	0			0	6-	0			0	6-	0			0
7-	0				7-	0				7-	0				7-	0			
8-		0	0	0	8-		0	0	0	8-		0	0	0	8-		0	0	0
9-		0	0		9-		0	0		9-		0	0		9-		0	0	
A-		0		0	A-		0		0	A-		0		0	A-		0		0
B-		0			B-		0			B-		0			B-		0		
C-			0	0	C-			0	0	C-			0	0	C-			0	0
D-			0		D-			0		D-			0		D-			0	
E-				0	E-				0	E-				0	E-				0
F-		OK			F-		OK			F-		OK			F-		OK		
	Servicecode appearent	not used	not used	not used		not used	not used	not used	not used		not used	not used	not used	not used		not used	Data transmission can not be initiated	Invalid data transmission	Invalid data transmission control signal failure

Possible reasons for code appearance
(own experiences)

Dyn Test 11

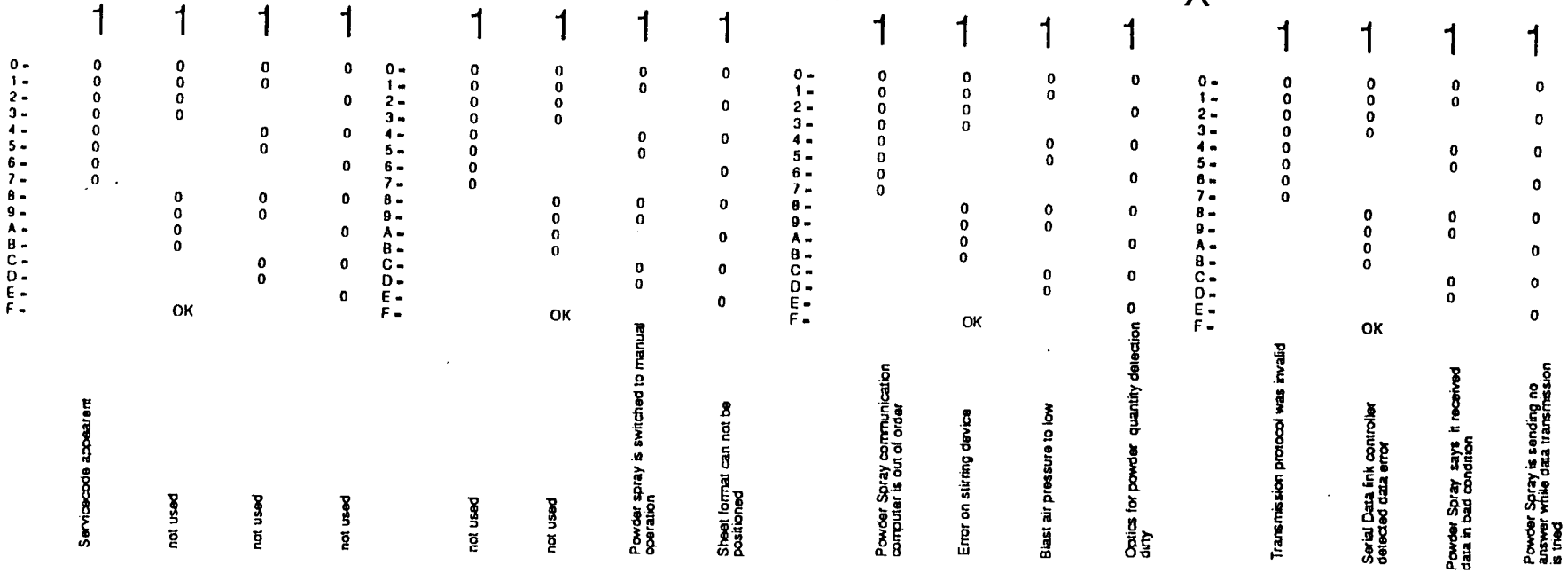
MID : X X X X



Possible reasons for code appearance
(own experiences)

Dyn Test 11 as of SW 5

PUD : X X X X



Possible reasons for code appearance
(own experiences)

Dy ldungen bis SW 4.6 / 6.

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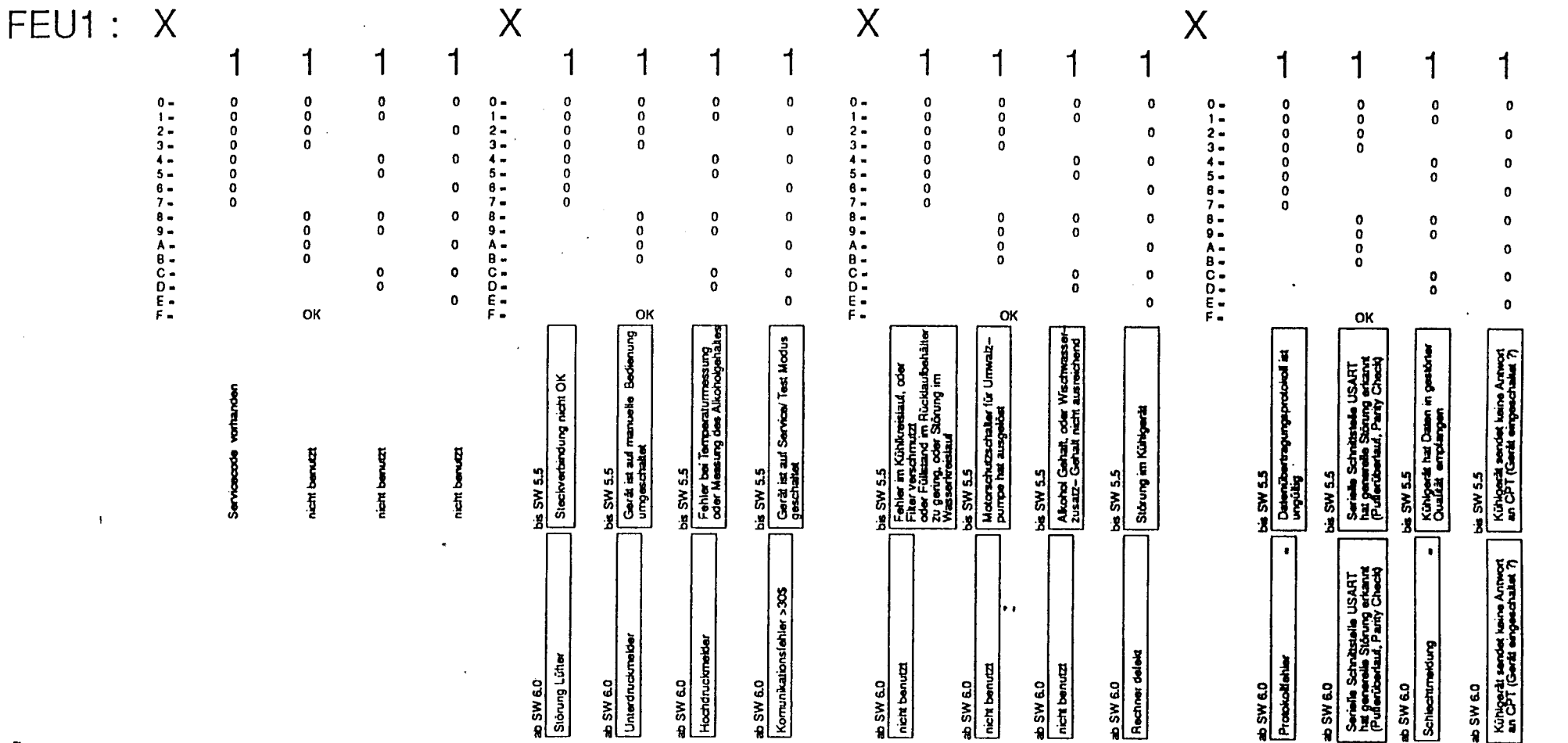
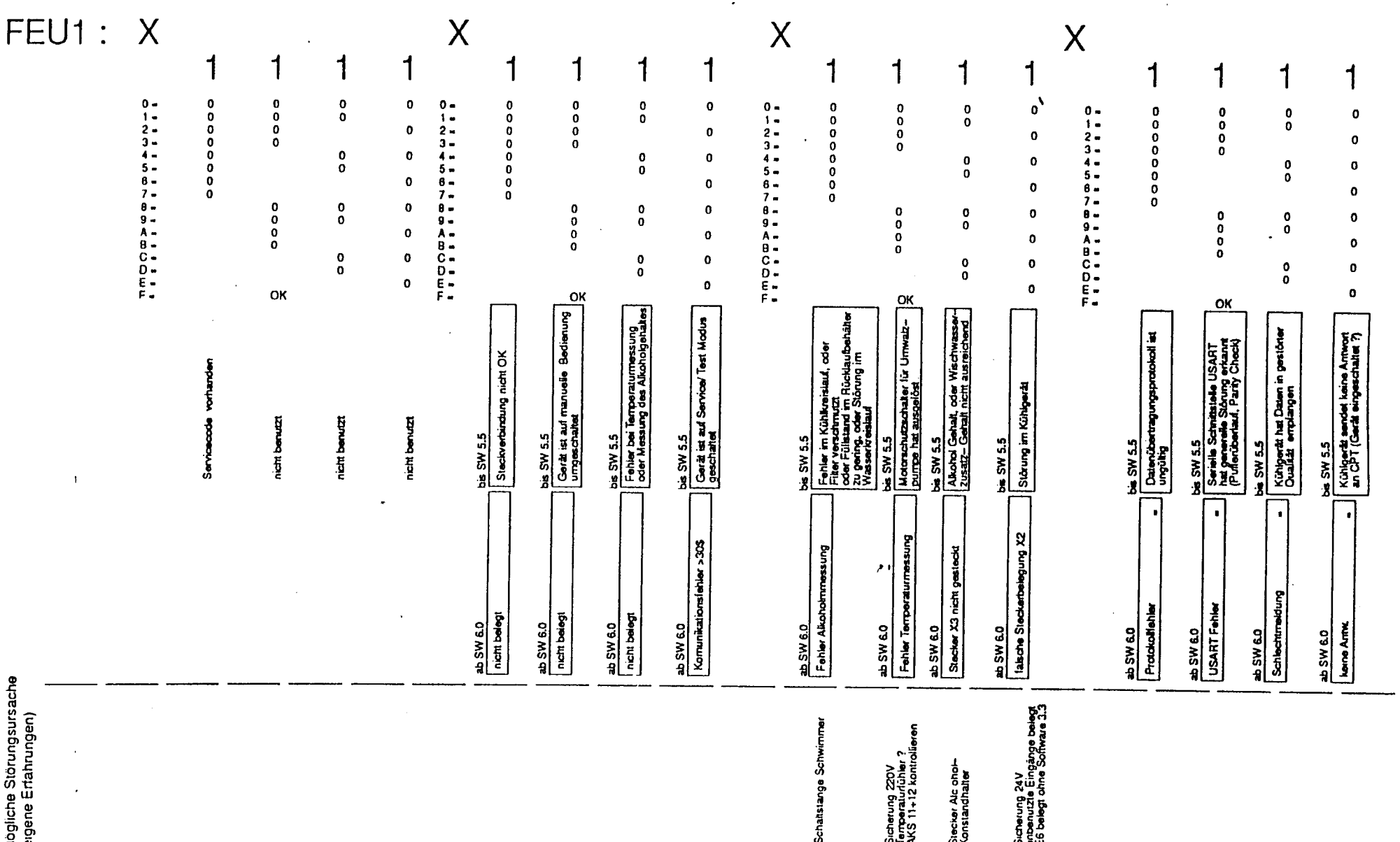
Dyn Test 11 — Kühl– und Umwälzgerät Technotrans FKC 2/4/6



Mögliche Störungsursache
(eigene Erfahrungen)

Dyn Test 11

Kühl– und Umwälzgerät Baldwin RCWL 821 –200/275



Mögliche Störungsursache
(eigene Erfahrungen)

Dyn Test 11 as of SW 5

FEU1 : X X X X

	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1
0 -	0	0	0	0	0 -	0	0	0	0	0 -	0	0	0	0	0 -	0	0	0	0
1 -	0	0	0		1 -	0	0	0		1 -	0	0	0		1 -	0	0	0	
2 -	0	0		0	2 -	0	0		0	2 -	0	0		0	2 -	0	0		0
3 -	0	0			3 -	0	0			3 -	0	0			3 -	0	0		
4 -	0		0	0	4 -	0		0	0	4 -	0		0	0	4 -	0		0	0
5 -	0		0		5 -	0		0		5 -	0		0		5 -	0		0	
6 -	0			0	6 -	0			0	6 -	0			0	6 -	0			0
7 -	0				7 -	0				7 -	0				7 -	0			
8 -		0	0	0	8 -		0	0	0	8 -		0	0	0	8 -		0	0	0
9 -		0	0		9 -		0	0		9 -		0	0		9 -		0	0	
A -		0		0	A -		0		0	A -		0		0	A -		0		0
B -		0			B -		0			B -		0			B -		0		
C -			0	0	C -			0	0	C -			0	0	C -			0	0
D -			0		D -			0		D -			0		D -			0	
E -				0	E -				0	E -				0	E -				0
F -		OK			F -		OK			F -		OK			F -		OK		

Service code appears!

not used

not used

not used

Plug in connection ??? is not OK

unit is switched to manual operation mode

Error on temperature or Alcohol measuring device

Sevice / Test mode is activated

Error in cooling fluid circuit, or Filter polluted, or level of reservoir not suffucient Error in Water circuit

Overload switch for circulation pumpTripped

Alcohol contents or additive volume not sufficient

Disturbance on cooling unit

Data transmission protocol is invalid

Serial Data link detected error

Refrigeration unit received data in bad condition

Refrigeration unit is sending no answer

Possible reasons for code appearance
(own experiences)

Dyn Codes up to SW ~~4.6/5.4~~

Dyn Test 1 Brushless Drive as of ~~SW 5.2~~

KVT : X

	1	1	1	1
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
	Servicecode appeares	not used	not used	not used
		OK		

X

	1	1	1	1
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
	KVT has been switched off because temperature override was discovered (TÜ = ??)	Overcurrent in power module KVT was discovered (Limit =???)	Power module KVT is defective	Interface C from TTK to KVT is defective
		OK		

X

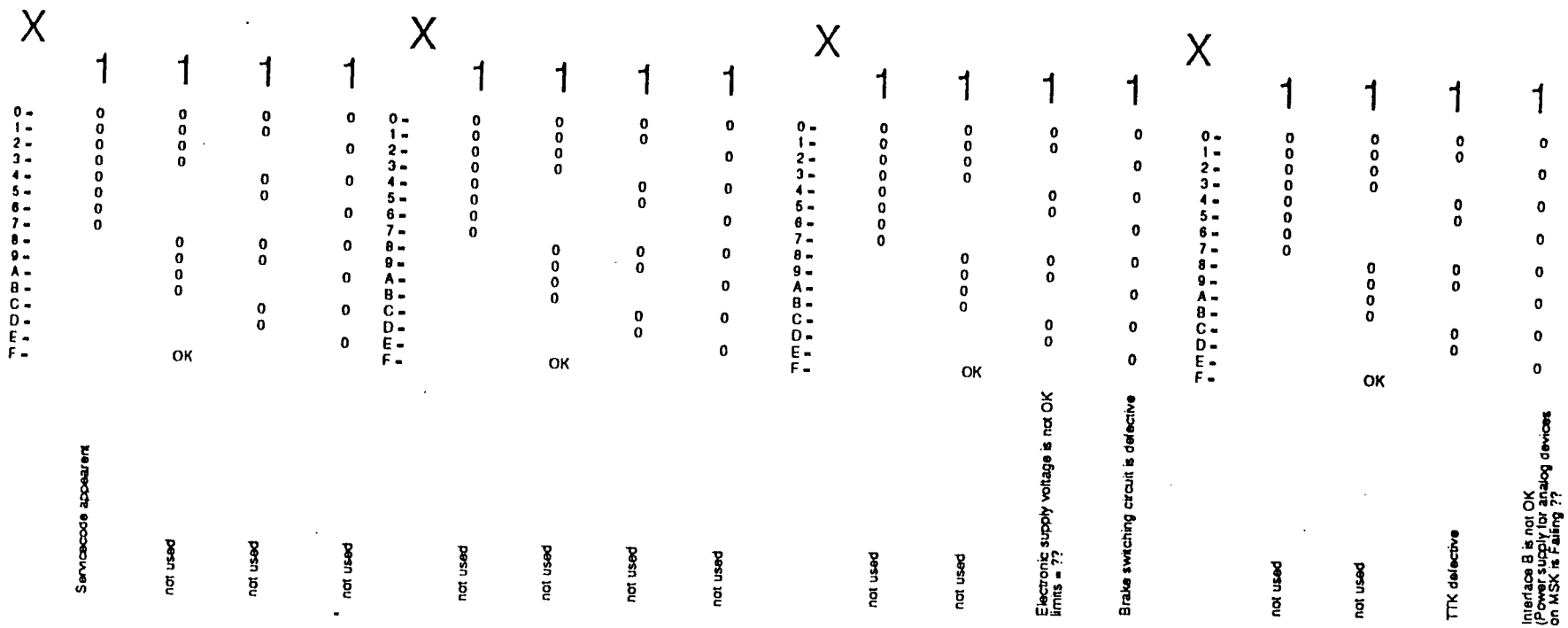
	1	1	1	1
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
	not used	not used	not used	not used
		OK		

X

	1	1	1	1
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
	not used	not used	not used	not used
		OK		

Possible reasons for code appearance
(own experiences)

Dyn Test 1 Brushless Drive as of SW 5.2



Possible reasons for code appearance
(own experiences)

Dyn 2SIO A_CTR

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too much degree movement during hitching

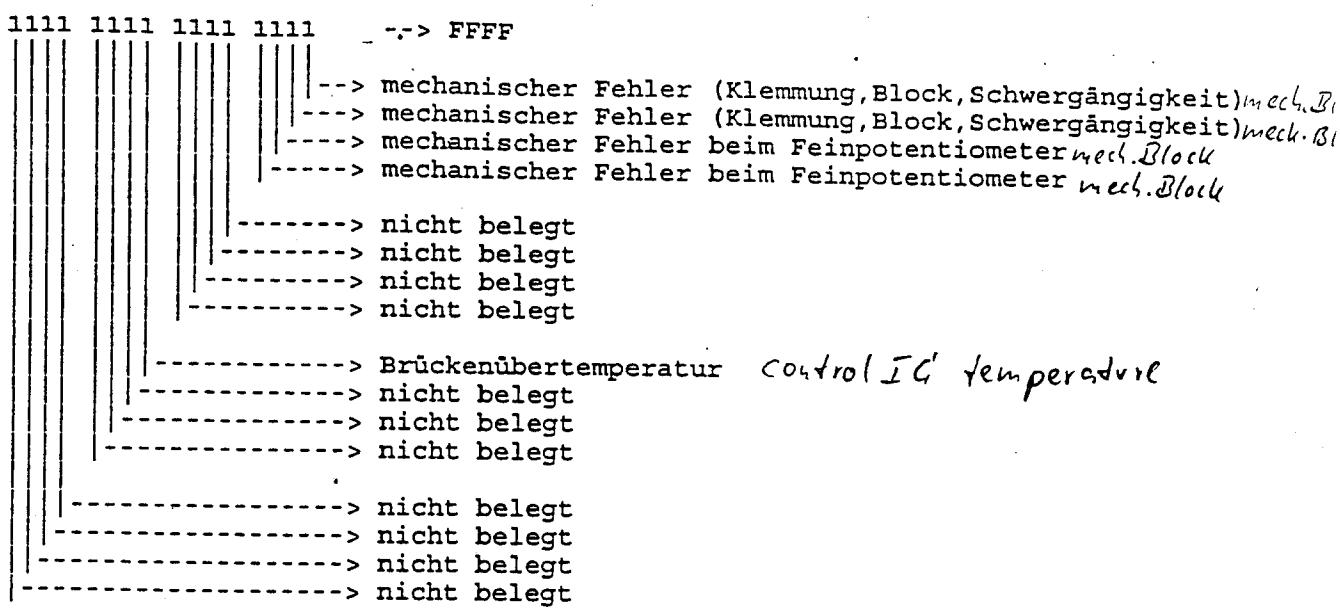
too slow positioning during hitching

motor movement while motor was not active

Stack Error 1 broke test failed

2SIO timer 2 failed

DYN-TEST-1 EWK1



7FFF / time

Dyn 2SK A_DRV

ZSK defect
message 16

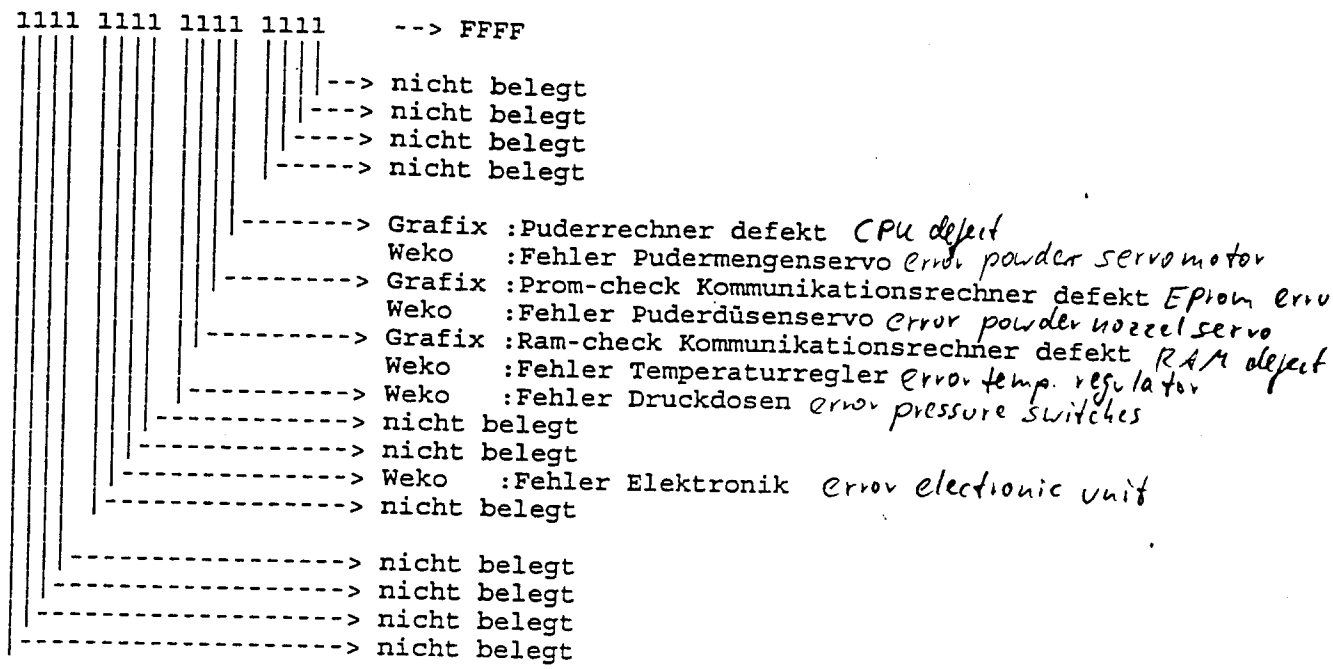
offset EMK, speed or I to high

- machine halt's too slow or main motor move next while not active

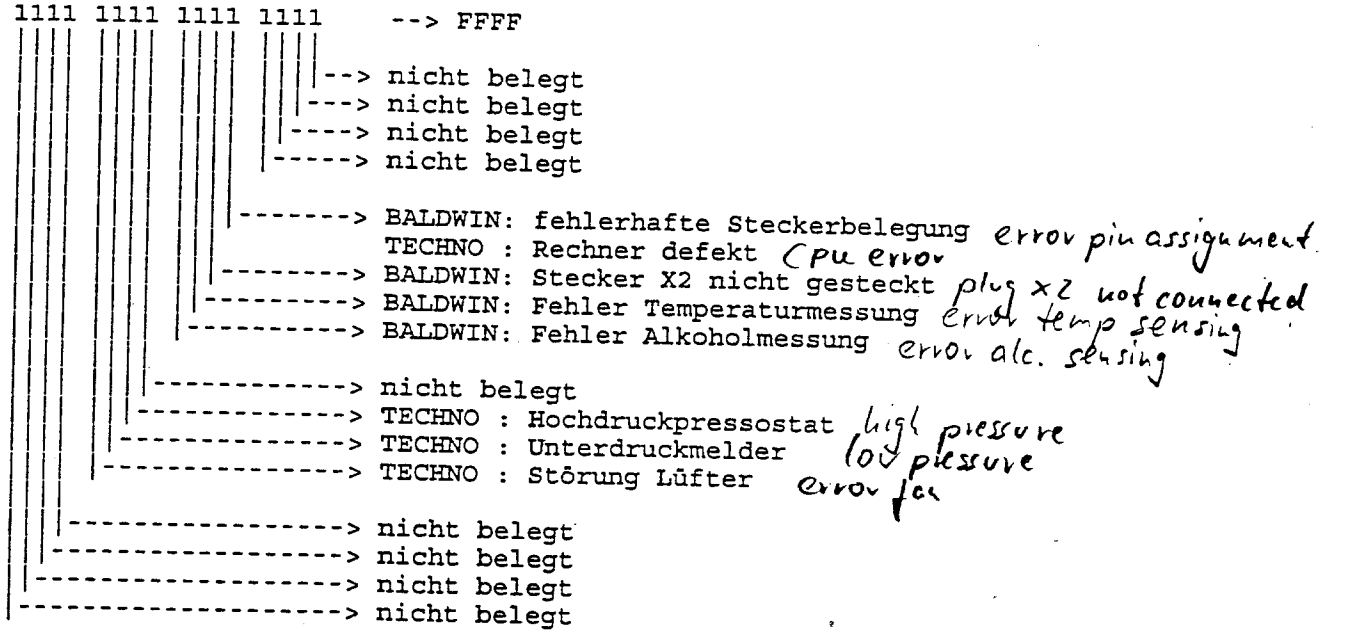
- EMK or speed too high while motor not active

communication Dual Port Ram error

DYN-TEST-3 PUD



DYN-TEST-3 FEU



Dyn TTK

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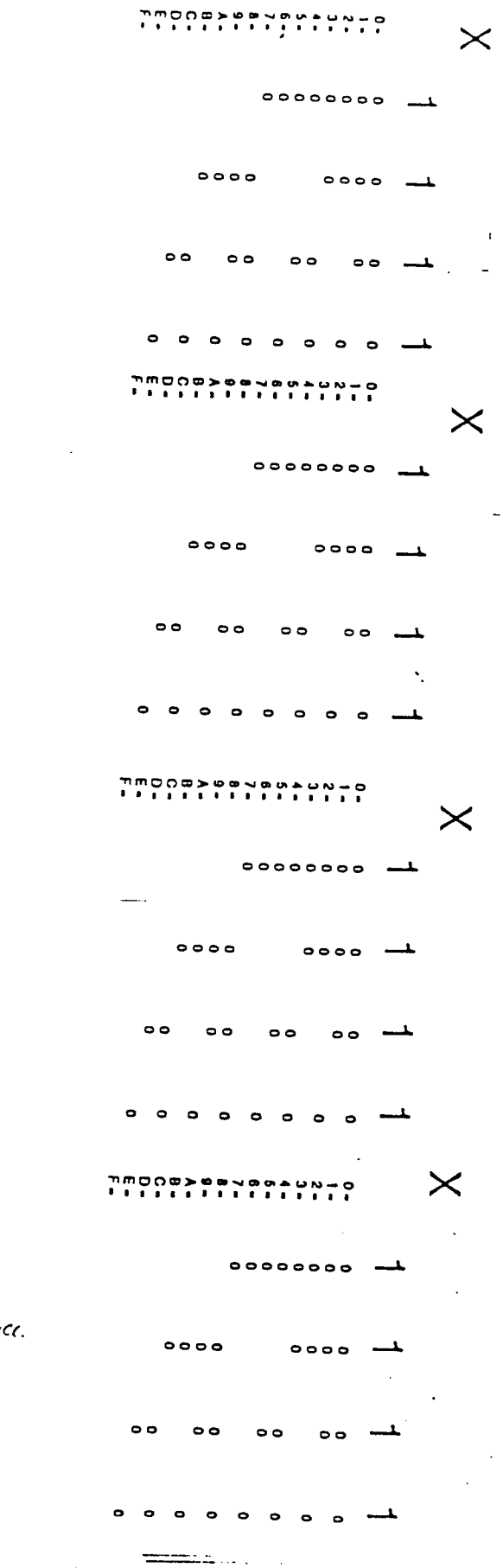
TTK defect
message A2

Intelligence Report
message A3

Error electronic supply voltage
message 42

Error bridge transistor
message 44

Dyn KVT



*BLT4_KVM not in socket
message 33

KVT plugs not connected
message 32

KVT overtemperature, switches BLT off
message 17

overcurrent powerpart
message 25

KVT defect
message 10

interface G defect
message 14

KVM not in socket
message 33

BLT4 too low current, power transistors, connec.
message 26

BLT4 tyristor defect
message 11

BLT4 too low voltage driver stage
message 15

Dyn BLT-Cou

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* ISETA FM, error message, motor stopped

motor temp sensor disconnected

Error water fache
message 43

Code error, combination

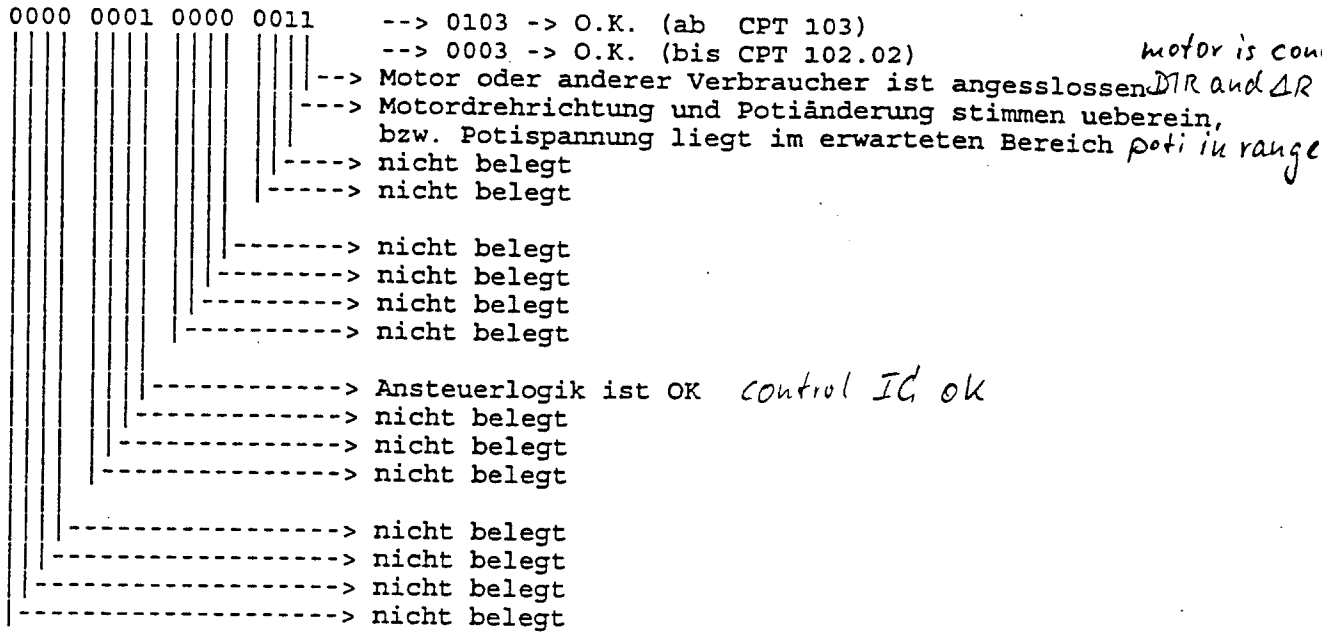
overvoltage 250V 48V

Error 48 VDC
message 4

Error 250 VDC
message 3

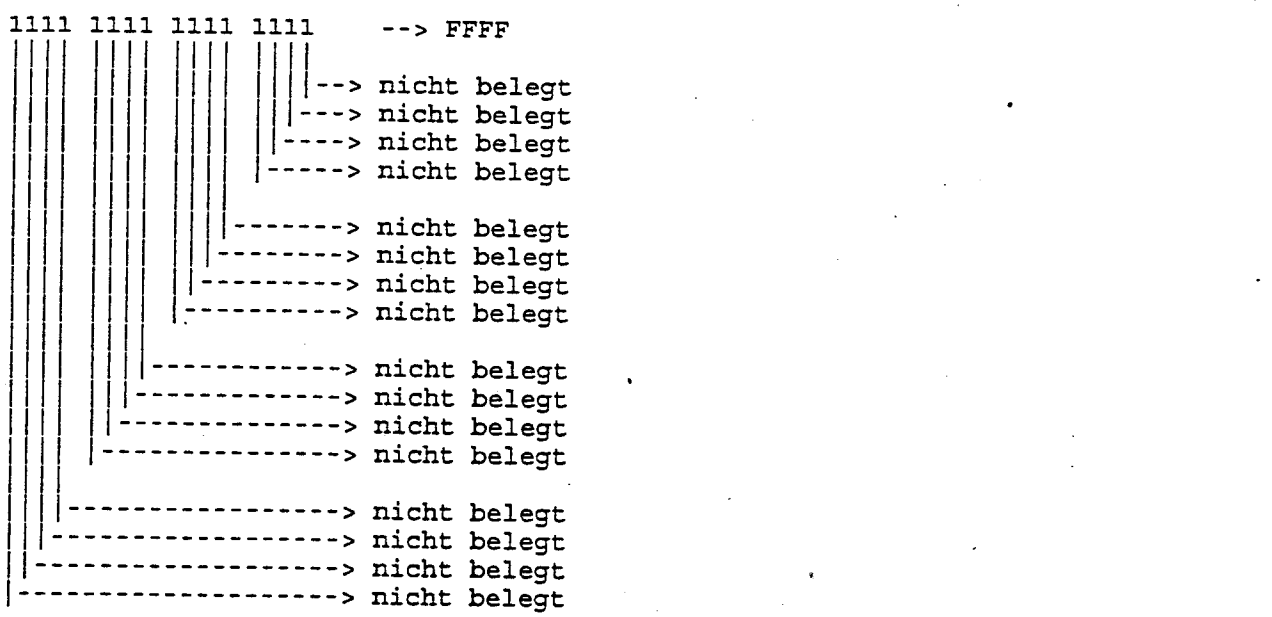
INIT-TEST-8 ,-9, -10 und -11

Stellantriebe 0 ... 127

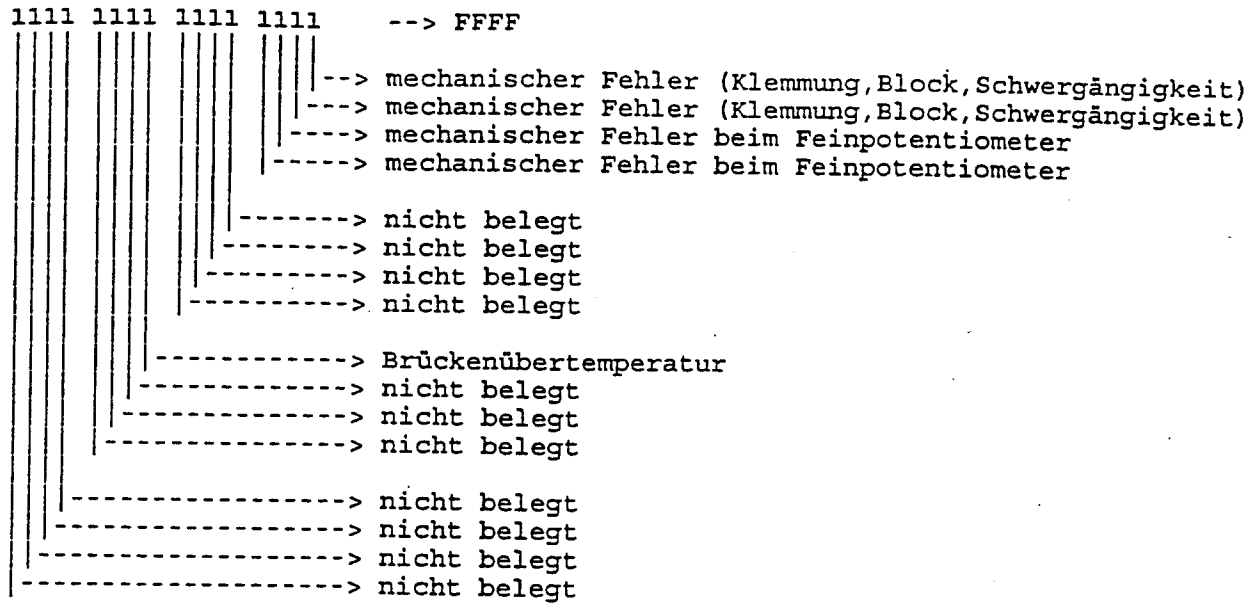


/**/

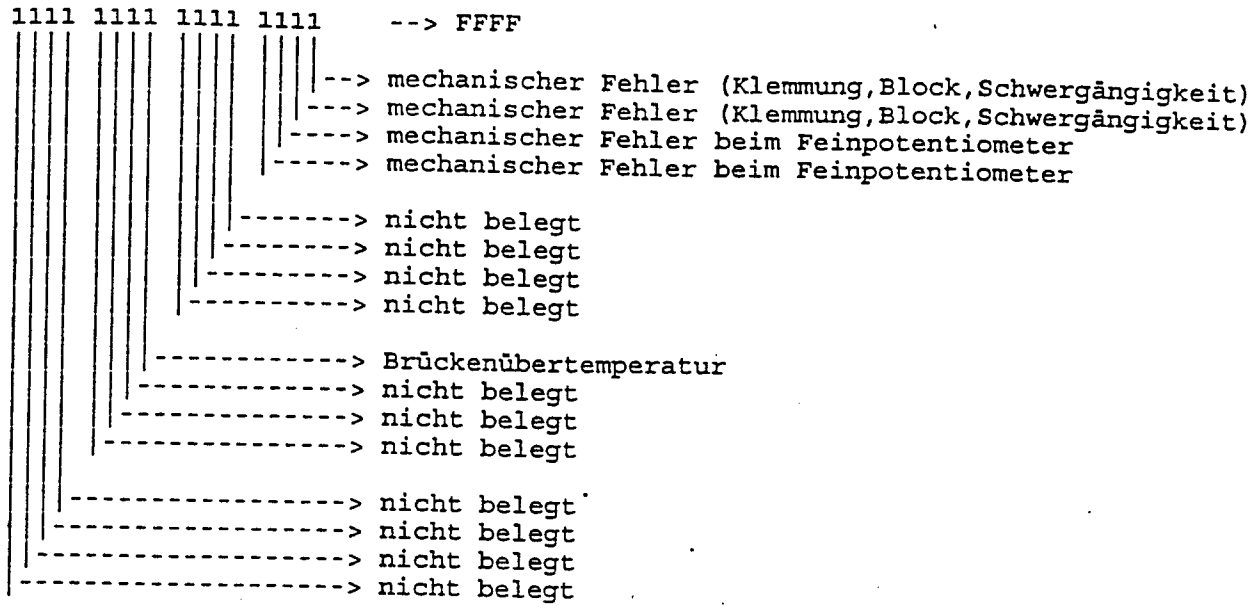
DYN-TEST-1 ZSK



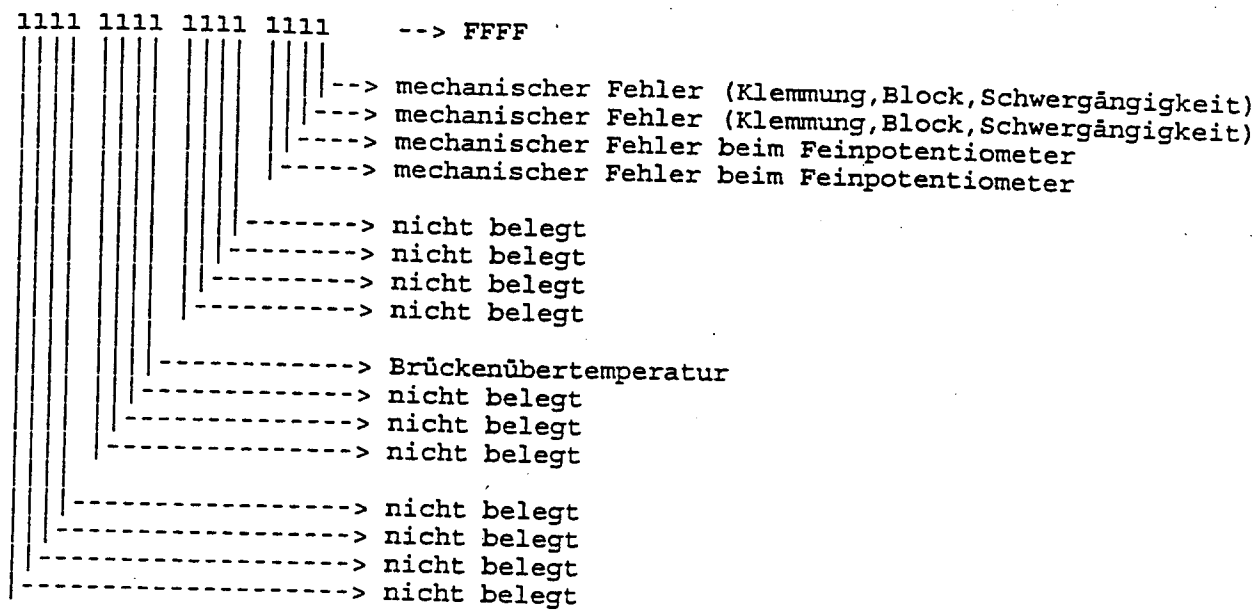
DYN-TEST-1 EWK2



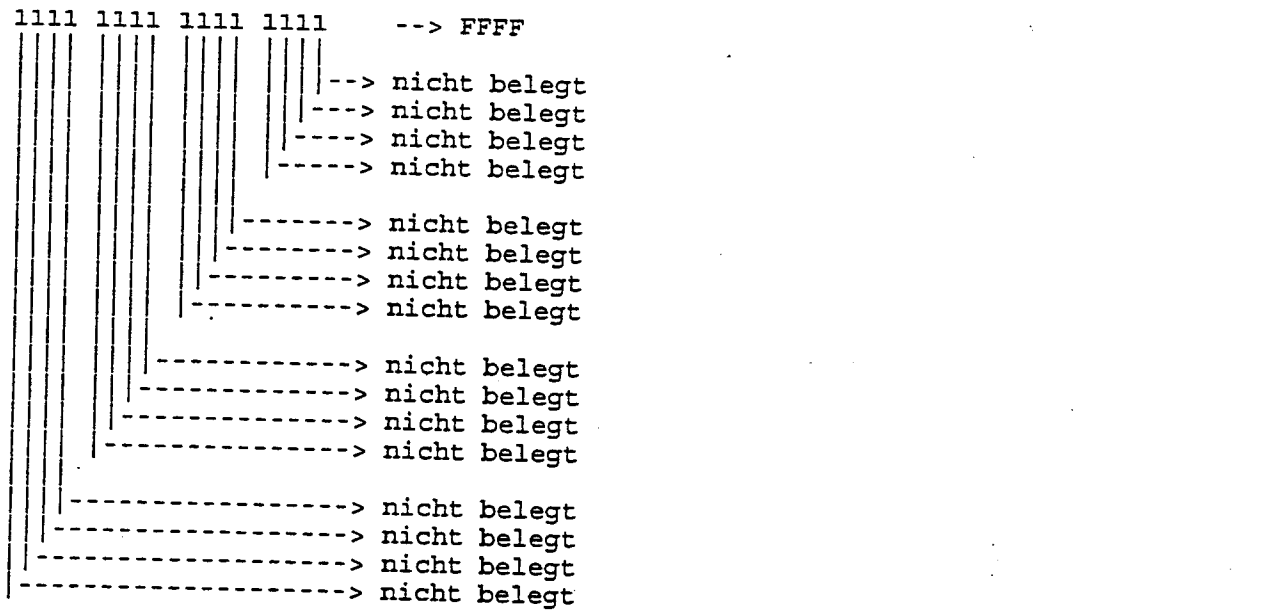
DYN-TEST-1 EWK3



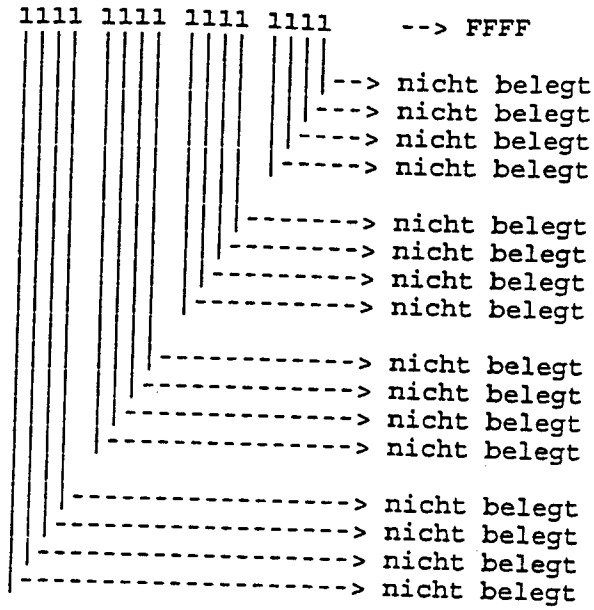
DYN-TEST-1 EWK4



DYN-TEST-1 DSK

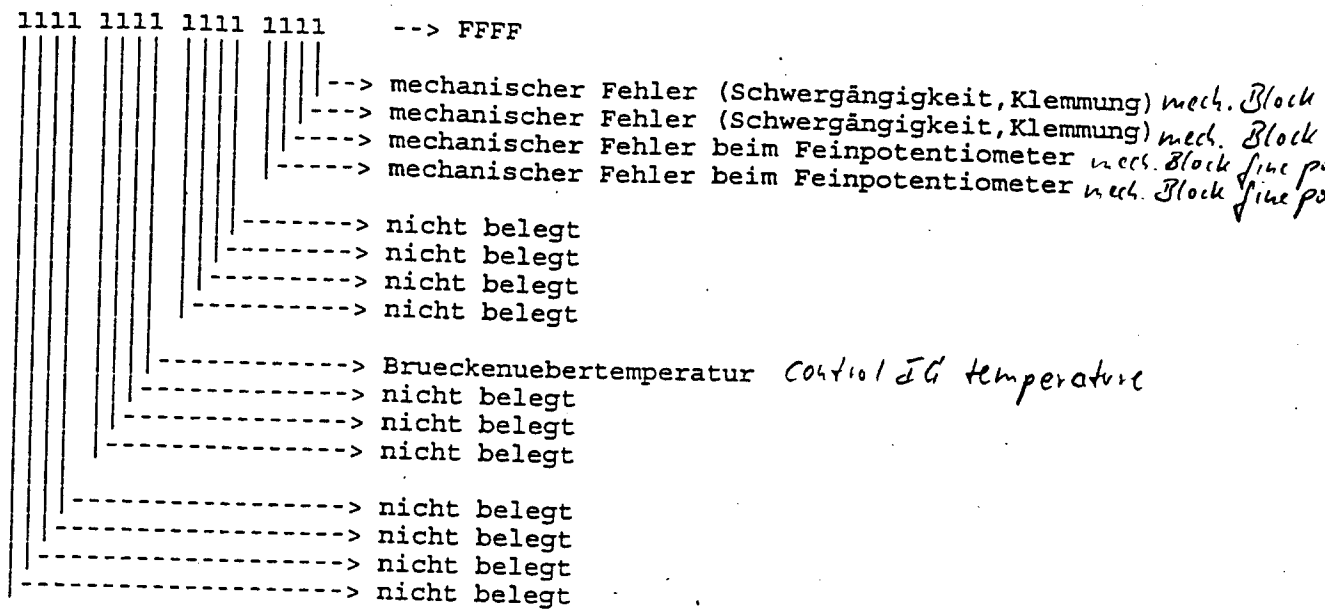


DYN-TEST-1 EAM



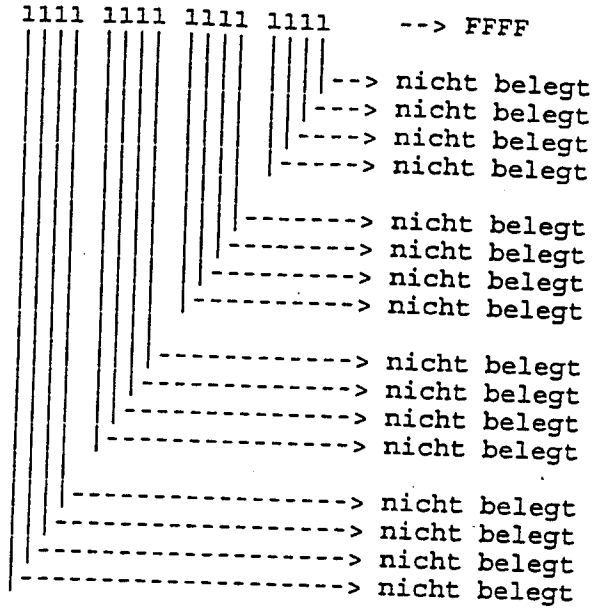
DYN-TEST-8 ,-9, -10 und -11

Stellantriebe 0 ... 127



/**/

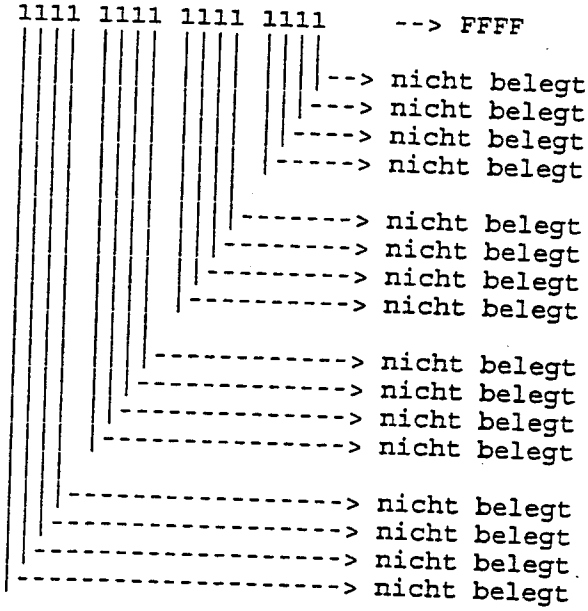
DYN-TEST-3 FDK



DYN-TEST-4 ,-5, -6 und -7

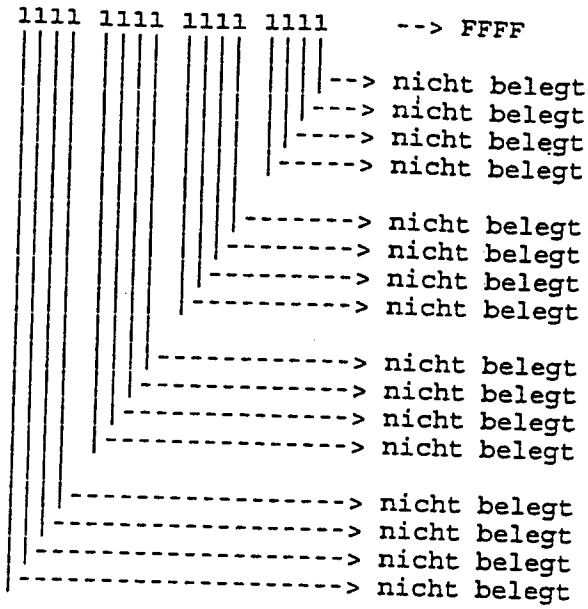
Hilfsantriebe 0 ... 119

(INFO -> R.Spilger Tel.: 7869)

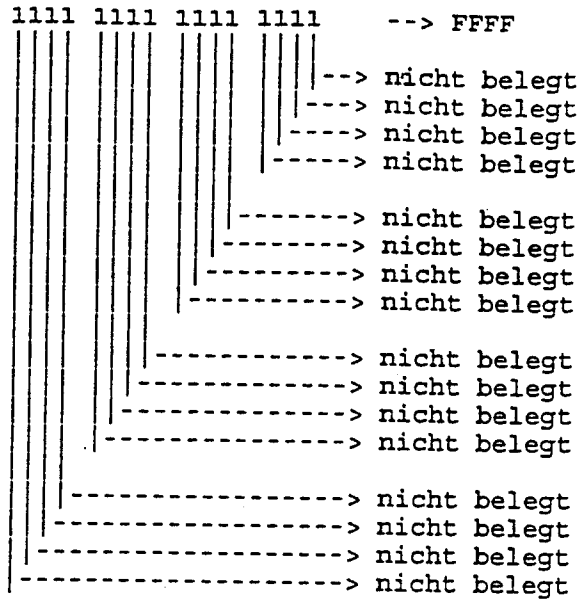


motor temp. to high or motorplug discon.

DYN-TEST-3 MID_11



DYN-TEST-3 MID_12



Input/output list

Overview

The input/output list shows the assignment of the inputs and outputs of the central control board ZSK and the extension board EWK1. It contains all inputs/outputs for the SM52 with compact electronics.

ZSK: feeder, delivery, PU1, central control cabinet

EWK1: control panel PU1, delivery console, PU2, sheet turning device

The components mentioned below are connected with the ZSK and EWK1 via the input/output distributor modules 1.15EVM3 and 2.15EVM3. The numbering of the inputs and outputs on the terminal strip of the EVM is identical with the numbering of the inputs and outputs in the service display.

At the inputs the following components are monitored:

- S: position switches, switches, buttons
- F: pressure switches
- Q: motor overload switches
- B: sensors
- electronic components (e.g. SEM, IWM etc.).

Via the outputs the following components are controlled:

- H: signal lamps, audible signal devices
- Y: solenoid valves
- K: contactors
- electronic modules and electronic boards (e.g. VSM, TTK, SAM etc.).

At the terminal strip of the EVM the following inputs/outputs are distinguished:

- differential inputs:
  D1 ... D4 (1.15EVM3) and
  D1 ... D4 (2.15EVM3)
- inputs (/E) and outputs (/A):
  1 ... 128, BR (1.15EVM3) and
  1 ... 128 (2.15EVM3)
- safety inputs:
  S1 ... S20 (1.15EVM3) and
  S1 ... S20 (2.15EVM3)

Central control board ZSK

GTOZ-S – central control cabinet ZSG and printing unit 1 (15EVM1)
SM74 – central control cabinet ZSG (15EVM1)

Terminals 15EVM1-XEA:	Function	only for	Plug EVM / ZSK and pin
D1	Sheet alignment control ANK O.S. 1B130	GTOZ-S	15EVM1-X1: 1 / ZSK-X13: 1
D2	Sheet alignment control ANK O.S. 1B130	GTOZ-S	15EVM1-X1: 2 / ZSK-X13: 2
D3	Sheet alignment control FUK O.S. 1B130	GTOZ-S	15EVM1-X2: 1 / ZSK-X14: 1
D4	Sheet alignment control FUK O.S. 1B130	GTOZ-S	15EVM1-X2: 2 / ZSK-X14: 2
1/E	Washup solution container E9: pressure switch 15F70 or "Lack of water GTW" 15B1	SM74	15EVM1-X1: 3 / ZSK-X13: 3
2/E	Compressor feeder/delivery M34 15Q34		15EVM1-X1: 4 / ZSK-X13: 4
3/E	Compressor pneumatic system M58 15Q58		15EVM1-X1: 5 / ZSK-X13: 5
4/E	Malfunction dryer (STA)		15EVM1-X1: 6 / ZSK-X13: 6
5/E	Air blast unit 1 dampening system M36 15Q36	GTOZ-S	15EVM1-X1: 7 / ZSK-X13: 7
6/E			15EVM1-X1: 8 / ZSK-X13: 8
7/E			15EVM1-X1: 9 / ZSK-X13: 9
8/E			15EVM1-X1: 10 / ZSK-X13: 10
9/E			15EVM1-X1: 11 / ZSK-X13: 11
10/E	Vacuum pump 1 sheet reversing device (for SM74: transfer drum) M43 15Q43		15EVM1-X1: 12 / ZSK-X13: 12
11/E			15EVM1-X1: 13 / ZSK-X13: 13
12/E	Emergency stop (STA), in the case of SM74 via RSK120		15EVM1-X1: 14 / ZSK-X13: 14
13/E	Blower powder spray device M46 15Q46		15EVM1-X1: 15 / ZSK-X13: 15
14/E			15EVM1-X1: 16 / ZSK-X13: 16
15/E	Power parts main pile STM1/STM2 15Q47	SM74	15EVM1-X1: 17 / ZSK-X13: 17
16/E			15EVM1-X1: 18 / ZSK-X13: 18
17/E			15EVM1-X1: 19 / ZSK-X13: 19
18/E	Cooling dampening system E50 15Q50		15EVM1-X1: 20 / ZSK-X13: 20
19/E	Automix E51 (dampening solution mixing unit) 15Q51	GTOZ-S	15EVM1-X1: 21 / ZSK-X13: 21
20/E	UV dryer in operation (STA)		15EVM1-X1: 22 / ZSK-X13: 22
21/E	Lack of dampening solution or alcohol / cooling and circulating device 15E50 15E50–B21	SM74-2	15EVM1-X1: 23 / ZSK-X13: 23
22/E	Pressure switch / compressor pneumatic system M58 15F22	GTOZ-S	15EVM1-X1: 24 / ZSK-X13: 24
23/E	Motor grease lubrication M56 (SM74), motor oil lubrication M56 (GTOZ-S) 15Q56		15EVM1-X1: 25 / ZSK-X13: 25
24/E			15EVM1-X1: 26 / ZSK-X13: 26
25/E	Washup solution container E9: pressure switch 15F70 or lack of washup solution GTW 15B25	SM74	15EVM1-X1: 27 / ZSK-X13: 27
26/E	Washup solution container E9: pressure switch 15F70 or lack of washup solution FWW 15B26	SM74	15EVM1-X1: 28 / ZSK-X13: 28
27/E			15EVM1-X1: 29 / ZSK-X13: 29
28/E	Earth-leakage monitoring IWM 15F28		15EVM1-X1: 30 / ZSK-X13: 30
29/E			15EVM1-X1: 31 / ZSK-X13: 31
30/E	Transformer protection 220 V AC (220/N2) 15Q30		15EVM1-X1: 32 / ZSK-X13: 32
31/E	Transformer protection 21 V AC (211/N4) 15Q31		15EVM1-X1: 33 / ZSK-X13: 33
32/E			15EVM1-X1: 34 / ZSK-X13: 34
33/A	Feeder clutch 11Y33 (VSM2-X1: 3), feeder on (STA)		15EVM1-X2: 3 / ZSK-X14: 3
34/A	Compressor feeder/delivery M34 (in the case of SM74 via VSM-X2: 4) 15K34M		15EVM1-X2: 4 / ZSK-X14: 4
35/A	Blow-off valve / compressor pneumatic system M58 GTOZ-S 15Y68, SM74 15Y35		15EVM1-X2: 5 / ZSK-X14: 5
36/A	Air blast unit 1 dampening system M36 15K36M	GTOZ-S	15EVM1-X2: 6 / ZSK-X14: 6
37/E			15EVM1-X2: 7 / ZSK-X14: 7
38/E			15EVM1-X2: 8 / ZSK-X14: 8
39/E			15EVM1-X2: 9 / ZSK-X14: 9
40/E			15EVM1-X2: 10 / ZSK-X14: 10
41/A			15EVM1-X2: 11 / ZSK-X14: 11
42/A			15EVM1-X2: 12 / ZSK-X14: 12
43/A	Vacuum pump 1 sheet reversing device (for SM74: transfer drum) M43 15K43M		15EVM1-X2: 13 / ZSK-X14: 13
44/A			15EVM1-X2: 14 / ZSK-X14: 14
45/A	Emergency stop (STA)		15EVM1-X2: 15 / ZSK-X14: 15
46/A	Blower powder spray device M46, powder spray device on/off 12E2 (also STA) 15K46M		15EVM1-X2: 16 / ZSK-X14: 16
47/A	Power parts main pile STM1/STM2 (only SM74) 15K47M control voltage brakes for brushless pile motors (SM74 and GTOZ-S) 15K47Ma		15EVM1-X2: 17 / ZSK-X14: 17
48/A			15EVM1-X2: 18 / ZSK-X14: 18
49/A			15EVM1-X2: 19 / ZSK-X14: 19

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Terminals 15EVM1-XEA:	Function	only for	Plug EVM / ZSK and pin
50/A	Cooling dampening system on/off E50 15K50M		15EVM1-X2: 20 / ZSK-X14: 20
51/A	Automix on/off E51 (dampening solution mixing unit) 15K51M	GTOZ-S	15EVM1-X2: 21 / ZSK-X14: 21
52/A	Paper in PU1 during production run (STA)		15EVM1-X2: 22 / ZSK-X14: 22
53/A	Dryer on/off / emergency stop (STA)		15EVM1-X2: 23 / ZSK-X14: 23
54/A	Radiators on/off (STA)		15EVM1-X2: 24 / ZSK-X14: 24
55/A	Operation, STA / static electricity eliminator 11E3		15EVM1-X2: 25 / ZSK-X14: 25
56/A	Motor grease lubrication M56 (SM74), motor oil lubrication M56 (GTOZ-S) 15K56M		15EVM1-X2: 26 / ZSK-X14: 26
57/A			15EVM1-X2: 27 / ZSK-X14: 27
58/A	Compressor pneumatic system M58 (GTOZ-S) 15K58M, compressor pneumatic system M58 and start-up relief valve 15Y158 (SM74) 15K58M		15EVM1-X2: 28 / ZSK-X14: 28
59/A			15EVM1-X2: 29 / ZSK-X14: 29
60/A			15EVM1-X2: 30 / ZSK-X14: 30
61/A	Admission of pressure compressor pneumatic system M58 15Y61	SM74	15EVM1-X2: 31 / ZSK-X14: 31
62/A	Fan BLT (via VSM-X2: 6) 15M62	SM74	15EVM1-X2: 32 / ZSK-X14: 32
63/A	Printed sheets in delivery (STA)		15EVM1-X2: 33 / ZSK-X14: 33
64/A			15EVM1-X2: 34 / ZSK-X14: 34
BR/A	Release brake in M1; main drive (for BLT)		15EVM1-X2: 35 / ZSK-X14: 35

GTOZ-S – feeder (11EVM2)
SM74 – feeder and printing unit 1 (11EVM2)

Terminals 11EVM2-XEA:	Function	only for	Plug EVM / ZSK and pin
D5	Sheet alignment control ANK O.S. 1B131	SM74	11EVM2-X3: 1 / ZSK-X15: 1
D6	Sheet alignment control ANK O.S. 1B131	SM74	11EVM2-X3: 2 / ZSK-X15: 2
D7	Sheet alignment control FUK O.S. 1B131	SM74	11EVM2-X4: 1 / ZSK-X16: 1
D8	Sheet alignment control FUK O.S. 1B131	SM74	11EVM2-X4: 2 / ZSK-X16: 2
65/E	"Emergency stop" button 11S65		11EVM2-X3: 3 / ZSK-X15: 3
66/E	Pushbutton "Run" 11S66		11EVM2-X3: 4 / ZSK-X15: 4
67/E	Light-up pushbutton "Compressor on/off" button 11S67		11EVM2-X3: 5 / ZSK-X15: 5
68/E			11EVM2-X3: 6 / ZSK-X15: 6
69/E	Light-up pushbutton "Paper run on/off" button 11S69		11EVM2-X3: 7 / ZSK-X15: 7
70/E	Light-up pushbutton "Dampening rollers on/off" button 11S70		11EVM2-X3: 8 / ZSK-X15: 8
71/E	Light-up pushbutton "Feeder on/off" button 11S71		11EVM2-X3: 9 / ZSK-X15: 9
72/E	Pushbutton "Release sheet stop finger" 11S72	SM74	11EVM2-X3: 10 / ZSK-X15: 10
73/E	Pushbutton "Forward" 11S73		11EVM2-X3: 11 / ZSK-X15: 11
74/E	Selector switch "Safe" 11S74		11EVM2-X3: 12 / ZSK-X15: 12
75/E	Pushbutton "Production run" 11S75		11EVM2-X3: 13 / ZSK-X15: 13
76/E	Pushbutton "Fast" 11S76		11EVM2-X3: 14 / ZSK-X15: 14
77/E	Pushbutton "Slow" 11S77		11EVM2-X3: 15 / ZSK-X15: 15
78/E			11EVM2-X3: 16 / ZSK-X15: 16
79/E	Control switch "Small sheet size" 11B79	GTOZ-S	11EVM2-X3: 17 / ZSK-X15: 17
80/E	Pushbutton "Main pile up" 11S80		11EVM2-X3: 18 / ZSK-X15: 18
81/E	Pushbutton "Main pile down" 11S81		11EVM2-X3: 19 / ZSK-X15: 19
82/E	Pushbutton "Pile stop" 11S82		11EVM2-X3: 20 / ZSK-X15: 20
83/E			11EVM2-X3: 21 / ZSK-X15: 21
84/E	Pushbutton "Auxiliary pile up" 11S84	SM74	11EVM2-X3: 22 / ZSK-X15: 22
85/E	Pushbutton "Auxiliary pile down" 11S85	SM74	11EVM2-X3: 23 / ZSK-X15: 23
86/E	Pushbutton "Stop" 11S86		11EVM2-X3: 24 / ZSK-X15: 24
87/E	Suction head limitation 11S87		11EVM2-X3: 25 / ZSK-X15: 25
88/E	Upper pile safety 11S88	SM74	11EVM2-X3: 26 / ZSK-X15: 26
89/E	Upper main pile limitation 11S89		11EVM2-X3: 27 / ZSK-X15: 27
90/E	Lower main pile limitation 11S90		11EVM2-X3: 28 / ZSK-X15: 28
91/E	Automatic pile transport 11B91		11EVM2-X3: 29 / ZSK-X15: 29
92/E	Upper auxiliary pile limitation 11S92	SM74	11EVM2-X3: 30 / ZSK-X15: 30
93/E	Lower auxiliary pile limitation 11S93	SM74	11EVM2-X3: 31 / ZSK-X15: 31
94/E			11EVM2-X3: 32 / ZSK-X15: 32
95/E	Pile support plate limitation (GTOZ-S), main pile down, slow (SM74) 11S95		11EVM2-X3: 33 / ZSK-X15: 33
96/E	Air control feeder blast / suction air 11S96		11EVM2-X3: 34 / ZSK-X15: 34
97/E	Pushbutton "Suction air suction tape plus" 11S97		11EVM2-X4: 3 / ZSK-X16: 3
98/E	Pushbutton "Suction air suction tape minus" 11S98		11EVM2-X4: 4 / ZSK-X16: 4
99/E	Feeder suction tape slow 11B99	GTOZ-S	11EVM2-X4: 5 / ZSK-X16: 5
100/E	Main pile up, slow 11S100	SM74	11EVM2-X4: 6 / ZSK-X16: 6
101/E			11EVM2-X4: 7 / ZSK-X16: 7
102/E	Grease level 11B102	SM74	11EVM2-X4: 8 / ZSK-X16: 8
103/E	Auxiliary pile detector 11B103	SM74	11EVM2-X4: 9 / ZSK-X16: 9
104/E	Main pile changeover to "Slow" with non-stop 11B104	SM74	11EVM2-X4: 10 / ZSK-X16: 10
105/A			11EVM2-X4: 11 / ZSK-X16: 11
106/A			11EVM2-X4: 12 / ZSK-X16: 12
107/A			11EVM2-X4: 13 / ZSK-X16: 13
108/A			11EVM2-X4: 14 / ZSK-X16: 14
109/A			11EVM2-X4: 15 / ZSK-X16: 15
110/A			11EVM2-X4: 16 / ZSK-X16: 16
111/A			11EVM2-X4: 17 / ZSK-X16: 17
112/A			11EVM2-X4: 18 / ZSK-X16: 18
113/A	Signal lamp "Not ready: feeder" (blue) 11H113		11EVM2-X4: 19 / ZSK-X16: 19
114/A	Inactivating (lifting) the pull lay 11Y114	SM74	11EVM2-X4: 20 / ZSK-X16: 20
115/A	Light-up pushbutton "Compressor on/off" lamp 11H67		11EVM2-X4: 21 / ZSK-X16: 21
116/A	Audible signal device 11H116		11EVM2-X4: 22 / ZSK-X16: 22
117/A	Light-up pushbutton "Paper run on/off" lamp 11H69		11EVM2-X4: 23 / ZSK-X16: 23
118/A	Light-up pushbutton "Dampening rollers on/off" lamp 11H70		11EVM2-X4: 24 / ZSK-X16: 24
119/A	Light-up pushbutton "Feeder on/off" lamp 11H71		11EVM2-X4: 25 / ZSK-X16: 25

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Terminals 11EVM2-XEA:	Function	only for	Plug EVM / ZSK and pin
120/A	Releasing the pull lay 11Y120	SM74	11EVM2-X4: 26 / ZSK-X16: 26
121/A	Signal lamp "Main switch on" 11H121		11EVM2-X4: 27 / ZSK-X16: 27
122/A	Signal lamp "Ready to run" 11H122		11EVM2-X4: 28 / ZSK-X16: 28
123/A	Signal lamp "Not ready: press" (red) 11H123		11EVM2-X4: 29 / ZSK-X16: 29
124/A	Signal lamp "Not ready: water/pneumatic system" 11H124		11EVM2-X4: 30 / ZSK-X16: 30
125/A			11EVM2-X4: 31 / ZSK-X16: 31
126/A			11EVM2-X4: 32 / ZSK-X16: 32
127/A	Feeder blast air 11Y127		11EVM2-X4: 33 / ZSK-X16: 33
128/A	Feeder suction air 11Y128		11EVM2-X4: 34 / ZSK-X16: 34

Extension board EWK1

GTOZ-S and SM74 – printing unit 1 (1EVM1))

Terminals 1EVM1-XEA:	Function	only for	Pug EVM / EWK and pin
D1	Sheet alignment control ANK D.S. 1B129		1EVM1-X1: 1 / EWK1-X11: 1
D2	Sheet alignment control ANK D.S. 1B129		1EVM1-X1: 2 / EWK1-X11: 2
D3	Sheet alignment control FÜK D.S. 1B129		1EVM1-X2: 1 / EWK1-X12: 1
D4	Sheet alignment control FÜK D.S. 1B129		1EVM1-X2: 2 / EWK1-X12: 2
1/E	Pull lay control O.S. 1B1		1EVM1-X1: 3 / EWK1-X11: 3
2/E	Pull lay control D.S. 1B2		1EVM1-X1: 4 / EWK1-X11: 4
3/E			1EVM1-X1: 5 / EWK1-X11: 5
4/E	Cam follower sheet reversing device 1S4	GTOZ-S	1EVM1-X1: 6 / EWK1-X11: 6
5/E	Recognition of operating condition: straight printing or straight printing and perfecting (SM74), monitoring of reversing drum (GTOZ-S) 1S5		1EVM1-X1: 7 / EWK1-X11: 7
6/E	Guard "Transfer gripper drum" 1S6	SM74	1EVM1-X1: 8 / EWK1-X11: 8
7/E	Monitoring of washing cloth 1B7	SM74	1EVM1-X1: 9 / EWK1-X11: 9
8/E	FWW Monitoring of ink blade 1B8	SM74	1EVM1-X1: 10 / EWK1-X11: 10
9/E	"Emergency stop" button O.S. 1S9		1EVM1-X1: 11 / EWK1-X11: 11
10/E	"Emergency stop" button KSP or D.S. 1S10	SM74	1EVM1-X1: 12 / EWK1-X11: 12
11/E	Pushbutton "Forward" O.S. 1S11		1EVM1-X1: 13 / EWK1-X11: 13
12/E	Selector switch "Safe" O.S. 1S12		1EVM1-X1: 14 / EWK1-X11: 14
13/E	Pushbutton "Backward" O.S. 1S13		1EVM1-X1: 15 / EWK1-X11: 15
14/E	Pushbutton "Forward" SM74-1: KSP, AUB 2S14; SM74-2: D.S. 1S14	SM74	1EVM1-X1: 16 / EWK1-X11: 16
15/E	Selector switch "Safe" SM74-1: KSP, AUB 2S15; SM74-2: D.S. 1S15	SM74	1EVM1-X1: 17 / EWK1-X11: 17
16/E	Pushbutton "Backward" SM74-1: KSP, AUB 2S16; SM74-2: D.S. 1S16	SM74	1EVM1-X1: 18 / EWK1-X11: 18
17/E	Pushbutton "Position" 1S17		1EVM1-X1: 19 / EWK1-X11: 19
18/E	Pawl changing the sheet size 1S18	GTOZ-S	1EVM1-X1: 20 / EWK1-X11: 20
19/E	Paper monitoring sheet reversing device 1S19		1EVM1-X1: 21 / EWK1-X11: 21
20/E	Pushbutton "Turn ink fountain roller" 1S20	SM74	1EVM1-X1: 22 / EWK1-X11: 22
21/E	Selector switch "Adjust dampening rollers" 1S21		1EVM1-X1: 23 / EWK1-X11: 23
22/E	Pushbutton "Wash dampening rollers" 1S22		1EVM1-X1: 24 / EWK1-X11: 24
23/E	Pushbutton "Crawl speed" 1S23		1EVM1-X1: 25 / EWK1-X11: 25
24/E	Bottom finger guard: 1 finger protecting spindle und bar GTOZ-S or 1 bottom finger protecting spindle SM74 1S24		1EVM1-X1: 26 / EWK1-X11: 26
25/E	Upper finger guard: 2 upper finger protecting spindles 1S25	SM74	1EVM1-X1: 27 / EWK1-X11: 27
26/E			1EVM1-X1: 28 / EWK1-X11: 28
27/E			1EVM1-X1: 29 / EWK1-X11: 29
28/E	Guard "Plate cylinder" 1S28		1EVM1-X1: 30 / EWK1-X11: 30
29/E	Guard "Dampening rollers" (GTOZ-S), guard "Inking or dampening rollers" (SM74) 1S29		1EVM1-X1: 31 / EWK1-X11: 31
30/E			1EVM1-X1: 32 / EWK1-X11: 32
31/E	Crank handle 1S31	SM74-1	1EVM1-X1: 33 / EWK1-X11: 33
32/E	Dampening solution sensor 1B32		1EVM1-X1: 34 / EWK1-X11: 34
33/E	Light-up pushbutton "Ink form rollers on/off" button 1S33		1EVM1-X2: 3 / EWK1-X12: 3
34/E	Light-up pushbutton "Ink ductor on/off" button 1S34		1EVM1-X2: 4 / EWK1-X12: 4
35/E	Light-up pushbutton "Plate mounting" button 1S35		1EVM1-X2: 5 / EWK1-X12: 5
36/E			1EVM1-X2: 6 / EWK1-X12: 6
37/E	Pressure switch oil lubrication 12 bars (GTOZ-S), pressure switch grease lubrication 20 bars (SM74) 1F37		1EVM1-X2: 7 / EWK1-X12: 7
38/E			1EVM1-X2: 8 / EWK1-X12: 8
39/E			1EVM1-X2: 9 / EWK1-X12: 9
40/E			1EVM1-X2: 10 / EWK1-X12: 10
41/A	Signal lamp "Not ready: printing unit" (blue) 1H41		1EVM1-X2: 11 / EWK1-X12: 11
42/A	Intermediate dampening roller on/off 1Y42	SM74	1EVM1-X2: 12 / EWK1-X12: 12
43/A			1EVM1-X2: 13 / EWK1-X12: 13
44/A	Branch "Feeder – GTW diaphragm on/off" 1Y44	SM74	1EVM1-X2: 14 / EWK1-X12: 14
45/A			1EVM1-X2: 15 / EWK1-X12: 15
46/A	Air blast unit dampening system (blower bar dampening system PU1) 1M46	SM74	1EVM1-X2: 16 / EWK1-X12: 16
47/A	Light-up pushbutton "Ink form rollers on/off" lamp 1H47		1EVM1-X2: 17 / EWK1-X12: 17
48/A	Light-up pushbutton "Ink ductor on/off" lamp 1H48		1EVM1-X2: 18 / EWK1-X12: 18

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Terminals 1EVM1-XEA:	Function	only for	Plug EVM / EWK and pin
49/A	Ink form rollers on/off 1Y49		1EVM1-X2: 19 / EWK1-X12: 19
50/A	Ink ductor on/off 1Y50		1EVM1-X2: 20 / EWK1-X12: 20
51/A	Dampening rollers on/off 1Y51		1EVM1-X2: 21 / EWK1-X12: 21
52/A	Impression on/off (stage 2 in the case of SM74) 1Y52		1EVM1-X2: 22 / EWK1-X12: 22
53/A	Light-up pushbutton "Plate mounting" lamp 1H53		1EVM1-X2: 23 / EWK1-X12: 23
54/A			1EVM1-X2: 24 / EWK1-X12: 24
55/A	Sheet stop finger 1Y55 (O.S.), in the case of SM74 also 1Y55a (D.S.) via 1KVM55		1EVM1-X2: 25 / EWK1-X12: 25
56/A	Gripper opening 1Y56		1EVM1-X2: 26 / EWK1-X12: 26
57/A			1EVM1-X2: 27 / EWK1-X12: 27
58/A	FWW washup solution 1Y58	SM74	1EVM1-X2: 28 / EWK1-X12: 28
59/A	FWW ink blade on/off 1Y59	SM74	1EVM1-X2: 29 / EWK1-X12: 29
60/A	GTW washup solution 1Y60	SM74	1EVM1-X2: 30 / EWK1-X12: 30
61/A	GTW diaphragm on/off 1Y61	SM74	1EVM1-X2: 31 / EWK1-X12: 31
62/A	GTW water 1Y62	SM74	1EVM1-X2: 32 / EWK1-X12: 32
63/A	Forward feed of washing cloth 1Y63	SM74	1EVM1-X2: 33 / EWK1-X12: 33
64/A			1EVM1-X2: 34 / EWK1-X12: 34
BR/A			

GTOZ-S – delivery (12EVM2)
SM74 – printing unit 1 and delivery (1EVM2)

Terminals 12/1EVM2-XEA:	Function	only for	Plug EVM / EWK and pin
D5			12 / 1EVM2-X3: 1 / EWK1-X13: 1
D6			12 / 1EVM2-X3: 2 / EWK1-X13: 2
D7	Synchronization GTOZ-S 12BD8, SM74 12B132		12 / 1EVM2-X4: 1 / EWK1-X14: 1
D8	Synchronization (jumper)		12 / 1EVM2-X4: 2 / EWK1-X14: 2
65/E	Door removal of missing sheets (only with sheet reversing device) 1S65	SM74	12 / 1EVM2-X3: 3 / EWK1-X13: 3
66/E	Guard "Washup device" 1S66	SM74	12 / 1EVM2-X3: 4 / EWK1-X13: 4
67/E	Guard "Inking unit" 1S67	SM74	12 / 1EVM2-X3: 5 / EWK1-X13: 5
68/E			12 / 1EVM2-X3: 6 / EWK1-X13: 6
69/A			12 / 1EVM2-X3: 7 / EWK1-X13: 7
70/A			12 / 1EVM2-X3: 8 / EWK1-X13: 8
71/A	Throwing on the blanket washup device (GTW) 1Y71	SM74	12 / 1EVM2-X3: 9 / EWK1-X13: 9
72/A	Locking the blanket washup device (GTW) 1Y72	SM74	12 / 1EVM2-X3: 10 / EWK1-X13: 10
73/A			12 / 1EVM2-X3: 11 / EWK1-X13: 11
74/A			12 / 1EVM2-X3: 12 / EWK1-X13: 12
75/A	Opening the front clamping bar 1Y75	SM74	12 / 1EVM2-X3: 13 / EWK1-X13: 13
76/A	Opening the rear clamping bar 1Y76	SM74	12 / 1EVM2-X3: 14 / EWK1-X13: 14
77/A	Impression on/off, stage 1 1Y77	SM74	12 / 1EVM2-X3: 15 / EWK1-X13: 15
78/A	Control air / air admission 1Y78	SM74	12 / 1EVM2-X3: 16 / EWK1-X13: 16
79/A	Contact pressure roller on/off 1Y79	SM74	12 / 1EVM2-X3: 17 / EWK1-X13: 17
80/A			12 / 1EVM2-X3: 18 / EWK1-X13: 18
81/E	Upper main pile limitation 12S81		12 / 1EVM2-X3: 19 / EWK1-X13: 19
82/E	Lower main pile limitation 12S82		12 / 1EVM2-X3: 20 / EWK1-X13: 20
83/E			12 / 1EVM2-X3: 21 / EWK1-X13: 21
84/E			12 / 1EVM2-X3: 22 / EWK1-X13: 22
85/E	Guard "Numbering shaft" 12S85		12 / 1EVM2-X3: 23 / EWK1-X13: 23
86/E	Paper safety, guard "Gripper bars" (only GTOZ-S) 12S86		12 / 1EVM2-X3: 24 / EWK1-X13: 24
87/E	Monitoring the sheet slowdown position 12S87		12 / 1EVM2-X3: 25 / EWK1-X13: 25
88/E			12 / 1EVM2-X3: 26 / EWK1-X13: 26
89/E	Stacking rake stop 12S89		12 / 1EVM2-X3: 27 / EWK1-X13: 27
90/E	Stacking rake down 12S90	SM74	12 / 1EVM2-X3: 28 / EWK1-X13: 28
91/E	Paper off, delivery down slow 12S91	SM74	12 / 1EVM2-X3: 29 / EWK1-X13: 29
92/E	Plexiglass guard "Delivery" 12S92	SM74	12 / 1EVM2-X3: 30 / EWK1-X13: 30
93/E	Pushbutton "Main pile up" 12S93		12 / 1EVM2-X3: 31 / EWK1-X13: 31
94/E	Pushbutton "Main pile down" 12S94		12 / 1EVM2-X3: 32 / EWK1-X13: 32
95/E	Pushbutton "Test" powder spray device 12E2		12 / 1EVM2-X3: 33 / EWK1-X13: 33
96/E	Fault powder spray device 12E2	SM74	12 / 1EVM2-X3: 34 / EWK1-X13: 34
97/E	Light-up pushbutton "Paper run on/off" (only with ZSP) button 12S97	SM74	12 / 1EVM2-X4: 3 / EWK1-X14: 3
98/E	Light-up pushbutton "Compressor on/off" (only with ZSP) button 12S98	SM74	12 / 1EVM2-X4: 4 / EWK1-X14: 4
99/E	Light-up pushbutton "Feeder on/off" (only with ZSP) button 12S99	SM74	12 / 1EVM2-X4: 5 / EWK1-X14: 5
100/E	Light-up pushbutton "Production run" 12S100	SM74	12 / 1EVM2-X4: 6 / EWK1-X14: 6
101/E	Pushbutton "Sheet slowdown fast" 12S101		12 / 1EVM2-X4: 7 / EWK1-X14: 7
102/E	Pushbutton "Sheet slowdown slow" 12S102		12 / 1EVM2-X4: 8 / EWK1-X14: 8
103/E	Light-up pushbutton "Job counter on/off" (only with ZSP) button 12S103	SM74	12 / 1EVM2-X4: 9 / EWK1-X14: 9
104/E	Pushbutton "Run" (only with ZSP) 12S104	SM74	12 / 1EVM2-X4: 10 / EWK1-X14: 10
105/E	Pushbutton "Fast" (only with ZSP) 12S105	SM74	12 / 1EVM2-X4: 11 / EWK1-X14: 11
106/E	Pushbutton "Slow" (only with ZSP) 12S106	SM74	12 / 1EVM2-X4: 12 / EWK1-X14: 12
107/E	Pushbutton "Stop" (only with ZSP) 12S107	SM74	12 / 1EVM2-X4: 13 / EWK1-X14: 13
108/E	Pushbutton "Dampening plus" (for PU1) 12S108		12 / 1EVM2-X4: 14 / EWK1-X14: 14
109/E	Pushbutton "Dampening plus" (for PU2) 12S109		12 / 1EVM2-X4: 15 / EWK1-X14: 15
110/E	Pushbutton "Dampening minus" (for PU1) 12S110		12 / 1EVM2-X4: 16 / EWK1-X14: 16
111/E	Pushbutton "Dampening minus" (for PU2) 12S111		12 / 1EVM2-X4: 17 / EWK1-X14: 17
112/E			12 / 1EVM2-X4: 18 / EWK1-X14: 18
113/E			12 / 1EVM2-X4: 19 / EWK1-X14: 19
114/E			12 / 1EVM2-X4: 20 / EWK1-X14: 20
115/E			12 / 1EVM2-X4: 21 / EWK1-X14: 21
116/E			12 / 1EVM2-X4: 22 / EWK1-X14: 22

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Terminals 12/1EVM2-XEA:	Function	only for	Plug EVM / EWK and pin
117/A	Sheet decurler on/off 12Y117	SM74	12 / 1EVM2-X4: 23 / EWK1-X14: 23
118/A	Numbering control cam on 12Y118		12 / 1EVM2-X4: 24 / EWK1-X14: 24
119/A	Numbering impression on 12Y119		12 / 1EVM2-X4: 25 / EWK1-X14: 25
120/A	Group of delivery fans 12M4, 12M5 and 12R1	GTOZ-S	12 / 1EVM2-X4: 26 / EWK1-X14: 26
121/A	Signal lamp "Not ready: press" (red), only with ZSP 12H121	SM74	12 / 1EVM2-X4: 27 / EWK1-X14: 27
122/A	"Powder on" (powdering cycle), powder spray device 12E2	SM74	12 / 1EVM2-X4: 28 / EWK1-X14: 28
123/A	Audible signal device 12H123		12 / 1EVM2-X4: 29 / EWK1-X14: 29
124/A	Light-up pushbutton "Paper run on/off" (only with ZSP) lamp 12H124	SM74	12 / 1EVM2-X4: 30 / EWK1-X14: 30
125/A	Light-up pushbutton "Compressor on/off" (only with ZSP) lamp 12H125	SM74	12 / 1EVM2-X4: 31 / EWK1-X14: 31
126/A	Light-up pushbutton "Feeder on/off" (only with ZSP) lamp 12H126	SM74	12 / 1EVM2-X4: 32 / EWK1-X14: 32
127/A	Light-up pushbutton "Job counter on/off" (only with ZSP) lamp 12H127	SM74	12 / 1EVM2-X4: 33 / EWK1-X14: 33
128/A	Signal lamp "Not ready: delivery" (blue) only with ZSP lamp 12H128	SM74	12 / 1EVM2-X4: 34 / EWK1-X14: 34

Extension board EWK2

GTOZ-S and SM74 – printing unit 2 (2EVM1)

Terminals 2EVM1-XEA:	Function	only for	Plug EVM / EWK and pin
D1			2EVM1-X1: 1 / EWK2-X11: 1
D2			2EVM1-X1: 2 / EWK2-X11: 2
D3			2EVM1-X2: 1 / EWK2-X12: 1
D4			2EVM1-X2: 2 / EWK2-X12: 2
1/E			2EVM1-X1: 3 / EWK2-X11: 3
2/E	Door sheet reversing device / changeover 2S2	SM74	2EVM1-X1: 4 / EWK2-X11: 4
3/E	Monitoring position of reversing drum in relation to storage drum 2S3	SM74	2EVM1-X1: 5 / EWK2-X11: 5
4/E	Cam follower reversing drum 2S4	SM74	2EVM1-X1: 6 / EWK2-X11: 6
5/E	Monitoring of clamping mechanism of sheet reversing device 2S5	SM74	2EVM1-X1: 7 / EWK2-X11: 7
6/E	Cylinder guard "Transfer cylinder" 2S6		2EVM1-X1: 8 / EWK2-X11: 8
7/E	GTW monitoring of washing cloth 2B7	SM74	2EVM1-X1: 9 / EWK2-X11: 9
8/E	FWW monitoring of ink blade 2B8	SM74	2EVM1-X1: 10 / EWK2-X11: 10
9/E	"Emergency stop" button (for GTOZ-S on KSP, for SM74-2 on DWB O.S.) 2S9		2EVM1-X1: 11 / EWK2-X11: 11
10/E	"Emergency stop" button AUB or KSP 2S10	SM74	2EVM1-X1: 12 / EWK2-X11: 12
11/E	Pushbutton "Forward" 2S11		2EVM1-X1: 13 / EWK2-X11: 13
12/E	Selector switch "Safe" 2S12		2EVM1-X1: 14 / EWK2-X11: 14
13/E	Pushbutton "Backward" 2S13		2EVM1-X1: 15 / EWK2-X11: 15
14/E	Pushbutton "Forward" AUB / KSP 2S14	SM74-2	2EVM1-X1: 16 / EWK2-X11: 16
15/E	Selector switch "Safe" AUB / KSP 2S15	SM74-2	2EVM1-X1: 17 / EWK2-X11: 17
16/E	Pushbutton "Backward" AUB / KSP 2S16	SM74-2	2EVM1-X1: 18 / EWK2-X11: 18
17/E	Pushbutton "Position" 2S17		2EVM1-X1: 19 / EWK2-X11: 19
18/E			2EVM1-X1: 20 / EWK2-X11: 20
19/E			2EVM1-X1: 21 / EWK2-X11: 21
20/E	Pushbutton "Turn ink fountain roller"; 2S20	SM74	2EVM1-X1: 22 / EWK2-X11: 22
21/E	Selector switch "Adjust dampening rollers"; 2S21		2EVM1-X1: 23 / EWK2-X11: 23
22/E	Pushbutton "Wash dampening rollers"; 2S22		2EVM1-X1: 24 / EWK2-X11: 24
23/E	Pushbutton "Crawl speed"; 2S23		2EVM1-X1: 25 / EWK2-X11: 25
24/E	Bottom finger guard: 1 finger protecting spindle and bar GTOZ-S or 1 bottom finger protecting spindle (blower bar) SM74 2S24		2EVM1-X1: 26 / EWK2-X11: 26
25/E	Upper finger guard: 2 upper finger protecting spindles 2S25	SM74	2EVM1-X1: 27 / EWK2-X11: 27
26/E			2EVM1-X1: 28 / EWK2-X11: 28
27/E			2EVM1-X1: 29 / EWK2-X11: 29
28/E	Guard "Plate cylinder" 2S28		2EVM1-X1: 30 / EWK2-X11: 30
29/E	Guard "Dampening rollers" (GTOZ-S), guard "Inking or dampening rollers" (SM74) 2S29		2EVM1-X1: 31 / EWK2-X11: 31
30/E			2EVM1-X1: 32 / EWK2-X11: 32
31/E	Crank handle 2S31	GTOZ-S; SM74-2	2EVM1-X1: 33 / EWK2-X11: 33
32/E	Dampening solution sensor 2B32		2EVM1-X1: 34 / EWK2-X11: 34
33/E	Light-up pushbutton "Ink form rollers on /off" button 2S33		2EVM1-X2: 3 / EWK2-X12: 3
34/E	Light-up pushbutton "Ink ductor on/off" button 2S34		2EVM1-X2: 4 / EWK2-X12: 4
35/E	Light-up pushbutton "Plate mounting" button 2S35		2EVM1-X2: 5 / EWK2-X12: 5
36/E			2EVM1-X2: 6 / EWK2-X12: 6
37/E			2EVM1-X2: 7 / EWK2-X12: 7
38/E			2EVM1-X2: 8 / EWK2-X12: 8
39/E			2EVM1-X2: 9 / EWK2-X12: 9
40/E	Position 2 Crank handle		2EVM1-X2: 10 / EWK2-X12: 10
41/A	Signal lamp "Not ready: printing unit" (blue) 2H41	SM74	2EVM1-X2: 11 / EWK2-X12: 11
42/A	Intermediate dampening roller on/off 2Y42	SM74	2EVM1-X2: 12 / EWK2-X12: 12
43/A			2EVM1-X2: 13 / EWK2-X12: 13
44/A			2EVM1-X2: 14 / EWK2-X12: 14
45/A			2EVM1-X2: 15 / EWK2-X12: 15
46/A	Air blast unit dampening system (blower bar dampening system PU2) 2M46	SM74	2EVM1-X2: 16 / EWK2-X12: 16
47/A	Light-up pushbutton "Ink form rollers on/off" lamp 2H47		2EVM1-X2: 17 / EWK2-X12: 17
48/A	Light-up pushbutton "Ink ductor on/off" lamp 2H48		2EVM1-X2: 18 / EWK2-X12: 18
49/A	Ink form rollers on/off 2Y49		2EVM1-X2: 19 / EWK2-X12: 19
50/A	Ink ductor on/off 2Y50		2EVM1-X2: 20 / EWK2-X12: 20

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Terminals 2EVM1-XEA:	Function	only for	Plug EVM / EWK and pin
51/A	Dampening rollers on/off 2Y51		2EVM1-X2: 21 / EWK2-X12: 21
52/A	Impression on/off (stage 2 in the case of SM74) 2Y52		2EVM1-X2: 22 / EWK2-X12: 22
53/A	Light-up pushbutton "Plate mounting" lamp 2H53		2EVM1-X2: 23 / EWK2-X12: 23
54/A			2EVM1-X2: 24 / EWK2-X12: 24
55/A			2EVM1-X2: 25 / EWK2-X12: 25
56/A			2EVM1-X2: 26 / EWK2-X12: 26
57/A			2EVM1-X2: 27 / EWK2-X12: 27
58/A	FWW washup solution; 2Y58	SM74	2EVM1-X2: 28 / EWK2-X12: 28
59/A	FWW ink blade on/off; 2Y59	SM74	2EVM1-X2: 29 / EWK2-X12: 29
60/A	GTW washup solution; 2Y60	SM74	2EVM1-X2: 30 / EWK2-X12: 30
61/A	GTW diaphragm on/off; 2Y61	SM74	2EVM1-X2: 31 / EWK2-X12: 31
62/A	GTW water; 2Y62	SM74	2EVM1-X2: 32 / EWK2-X12: 32
63/A	Forward feed of washing cloth; 2Y63	SM74	2EVM1-X2: 33 / EWK2-X12: 33
64/A			2EVM1-X2: 34 / EWK2-X12. 34
BR/A			

SM74 – printing unit 2 (2EVM2)

Terminals/ 2EVM2-XEA:	Function	only for	Plug EVM / EWK and pin
D5			2EVM2-X3: 1 / EWK2-X13: 1
D6			2EVM2-X3: 2 / EWK2-X13: 2
D7			2EVM2-X4: 1 / EWK2-X14: 1
D8			2EVM2-X4: 2 / EWK2-X14: 2
65/E			2EVM2-X3: 3 / EWK2-X13: 3
66/E	Guard "Washup device" 2S66	SM74	2EVM2-X3: 4 / EWK2-X13: 4
67/E	Guard "Inking unit" 2S67	SM74	2EVM2-X3: 5 / EWK2-X13: 5
68/E			2EVM2-X3: 6 / EWK2-X13: 6
69/A			2EVM2-X3: 7 / EWK2-X13: 7
70/A			2EVM2-X3: 8 / EWK2-X13: 8
71/A	Throwing on the blanket washup device (GTW) 2Y71	SM74	2EVM2-X3: 9 / EWK2-X13: 9
72/A	Locking the blanket washup device (GTW) 2Y72	SM74	2EVM2-X3: 10 / EWK2-X13: 10
73/A			2EVM2-X3: 11 / EWK2-X13: 11
74/A			2EVM2-X3: 12 / EWK2-X13: 12
75/A	Opening the front clamping bar 2Y75	SM74	2EVM2-X3: 13 / EWK2-X13: 13
76/A	Opening the rear clamping bar 2Y76	SM74	2EVM2-X3: 14 / EWK2-X13: 14
77/A	Impression on/off, stage 1 2Y77	SM74	2EVM2-X3: 15 / EWK2-X13: 15
78/A	Control air / air admission 2Y78	SM74	2EVM2-X3: 16 / EWK2-X13: 16
79/A	Contact pressure roller on/off 2Y79	SM74	2EVM2-X3: 17 / EWK2-X13: 17
80/A			2EVM2-X3: 18 / EWK2-X13: 18
81/E			2EVM2-X3: 19 / EWK2-X13: 19
82/E			2EVM2-X3: 20 / EWK2-X13: 20
83/E			2EVM2-X3: 21 / EWK2-X13: 21
84/E			2EVM2-X3: 22 / EWK2-X13: 22
85/E			2EVM2-X3: 23 / EWK2-X13: 23
86/E			2EVM2-X3: 24 / EWK2-X13: 24
87/E			2EVM2-X3: 25 / EWK2-X13: 25
88/E			2EVM2-X3: 26 / EWK2-X13: 26
89/E			2EVM2-X3: 27 / EWK2-X13: 27
90/E			2EVM2-X3: 28 / EWK2-X13: 28
91/E			2EVM2-X3: 29 / EWK2-X13: 29
92/E			2EVM2-X3: 30 / EWK2-X13: 30
93/E			2EVM2-X3: 31 / EWK2-X13: 31
94/E			2EVM2-X3: 32 / EWK2-X13: 32
95/E			2EVM2-X3: 33 / EWK2-X13: 33
96/E			2EVM2-X3: 34 / EWK2-X13: 34
97/A			2EVM2-X4: 3 / EWK2-X14: 3
98/A			2EVM2-X4: 4 / EWK2-X14: 4
99/A			2EVM2-X4: 5 / EWK2-X14: 5
100/A			2EVM2-X4: 6 / EWK2-X14: 6
101/A			2EVM2-X4: 7 / EWK2-X14: 7
102/A			2EVM2-X4: 8 / EWK2-X14: 8
103/A			2EVM2-X4: 9 / EWK2-X14: 9
104/A			2EVM2-X4: 10 / EWK2-X14: 10
105/A			2EVM2-X4: 11 / EWK2-X14: 11
106/A			2EVM2-X4: 12 / EWK2-X14: 12
107/A			2EVM2-X4: 13 / EWK2-X14: 13
108/A			2EVM2-X4: 14 / EWK2-X14: 14
109/A			2EVM2-X4: 15 / EWK2-X14: 15
110/A			2EVM2-X4: 16 / EWK2-X14: 16
111/A			2EVM2-X4: 17 / EWK2-X14: 17
112/A			2EVM2-X4: 18 / EWK2-X14: 18
113/A			2EVM2-X4: 19 / EWK2-X14: 19
114/A			2EVM2-X4: 20 / EWK2-X14: 20
115/A			2EVM2-X4: 21 / EWK2-X14: 21
116/A			2EVM2-X4: 22 / EWK2-X14: 22
117/A			2EVM2-X4: 23 / EWK2-X14: 23
118/A			2EVM2-X4: 24 / EWK2-X14: 24
119/A			2EVM2-X4: 25 / EWK2-X14: 25
120/A			2EVM2-X4: 26 / EWK2-X14: 26

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Terminals/ 2EVM2-XEA:	Function	only for	Plug EVM / EWK and pin
121/A			2EVM2-X4: 27 / EWK2-X14: 27
122/A			2EVM2-X4: 28 / EWK2-X14: 28
123/A			2EVM2-X4: 29 / EWK2-X14: 29
124/A			2EVM2-X4: 30 / EWK2-X14: 30
125/A			2EVM2-X4: 31 / EWK2-X14: 31
126/A			2EVM2-X4: 32 / EWK2-X14: 32
127/A			2EVM2-X4: 33 / EWK2-X14: 33
128/A			2EVM2-X4: 34 / EWK2-X14: 34

Safety inputs to the central control board ZSK

Central control cabinet (control console)

Terminals 15EVM1-XEA:	Function	Only for	Safety inputs	Plug EVM / ZSK and pin
S1	"Emergency stop" button on ZSP 13S163, in the case of KSP jumpered to +1		No. 1	15EVM1-X1S: 1 / ZSK-X27: 1
S2				15EVM1-X1S: 2 / ZSK-X27: 2
S3				15EVM1-X1S: 3 / ZSK-X27: 3
S4				15EVM1-X1S: 4 / ZSK-X27: 4
S5				15EVM1-X1S: 5 / ZSK-X27: 5
S6				15EVM1-X1S: 6 / ZSK-X27: 6
S7				15EVM1-X1S: 7 / ZSK-X27: 7
S8				15EVM1-X1S: 8 / ZSK-X27: 8
S9				15EVM1-X1S: 9 / ZSK-X27: 9
S10				15EVM1-X1S: 10 / ZSK-X27: 10

Feeder

Terminals 11EVM2-XEA:	Function	Only for	Safety inputs	Plug EVM / ZSK and pin
S11	"Emergency stop" button; 11S65		No. 5	11EVM1-X2S: 1 / ZSK-X28: 1
S12	Suction head limitation 11S87 *additionally for SM74:* upper pile safety 11S88		No. 6	11EVM1-X2S: 2 / ZSK-X28: 2
S13				11EVM1-X2S: 3 / ZSK-X28: 3
S14	Pile support plate limitation (GTOZ-S) main pile down, slow (SM74) 11S95		No.7	11EVM1-X2S: 4 / ZSK-X28: 4
S15	Upper main pile limitation 11S89		No. 8	11EVM1-X2S: 5 / ZSK-X28: 5
S16	Lower main pile limitation 11S90		No. 9	11EVM1-X2S: 6 / ZSK-X28: 6
S17	Upper auxiliary pile limitation 11S92	SM74	No.10	11EVM1-X2S: 7 / ZSK-X28: 7
S18	Lower auxiliary pile limitation 11S93	SM74	No.11	11EVM1-X2S: 8 / ZSK-X28: 8
S19				11EVM1-X2S: 9 / ZSK-X28: 9
S20				11EVM1-X2S: 10 / ZSK-X28: 10

Printing unit 1 (control console)

Terminals 1EVM1-XEA:	Function	Only for	Safety inputs	Plug EVM / ZSK and pin
S1	"Emergency stop" button O.S. 1S9, emergency stop button 1S10 (KSP SM74-1 / D.S. SM74-2)		No. 13	1EVM1-X1S: 1 / ZSK-X29: 1
S2	Bottom finger guard 1S24 *additionally for SM74:* upper finger guard 1S25, door removal of missing sheets 1S65, guard "Washup device" 1S66, guard "Inking unit" 1S67		No. 14	1EVM1-X2S: 2 / ZSK-X29: 2
S3	Guard "Dampening rollers" (GTOZ-S), guard "Inking or dampening rollers" (SM74) 1S29		No. 14	1EVM1-X2S: 3 / ZSK-X29: 3
S4	Crank handle 1S31	SM74-1	No. 14	1EVM1-X2S: 4 / ZSK-X29: 4
S5	Guard "Plate cylinder" 1S28		No. 15	1EVM1-X2S: 5 / ZSK-X29: 5
S6				1EVM1-X2S: 6 / ZSK-X29: 6
S7				1EVM1-X2S: 7 / ZSK-X29: 7
S8	Guard "Transfer gripper drum" 1S6	SM74	No. 17	1EVM1-X2S: 8 / ZSK-X29: 8
S9				1EVM1-X2S: 9 / ZSK-X29: 9
S10				1EVM1-X2S: 10 / ZSK-X29: 10

continued on next page

Delivery

Terminals 12/1EVM2-XEA:	Function	Only for	Safety inputs	Plug EVM / ZSK and pin
S11	Jumper to +1	GTOZ-S		12EVM2-X2S: 1 / ZSK-X30: 1
S12	Upper main pile limitation 12S81		No. 19	12EVM2-X2S: 2 / ZSK-X30: 2
S13	Lower main pile limitation 12S82		No. 20	12EVM2-X2S: 3 / ZSK-X30: 3
S14				12EVM2-X2S: 4 / ZSK-X30: 4
S15				12EVM2-X2S: 5 / ZSK-X30: 5
S16	Guard "Numbering shaft" 12S85		No. 23	12EVM2-X2S: 6 / ZSK-X30: 6
S17				12EVM2-X2S: 7 / ZSK-X30: 7
S18	Monitoring position of sheet slowdown 12S87		No. 25	12EVM2-X2S: 8 / ZSK-X30: 8
S19	Plexiglass guard "Delivery" (SM74) 12S92, paper safety, guard "Gripper bars" (only GTOZ-S) 12S86		No. 26	12EVM2-X2S: 9 / ZSK-X30: 9
S20				12EVM2-X2S: 10 / ZSK-X30: 10

Printing unit 2 (control console)

Terminals 2EVM1-XEA:	Function	Only for	Safety inputs	Plug EVM / ZSK and pin
S1	"Emergency stop" button O.S. (for GTOZ-S on KSP; for SM74 on DWB) 2S9, "Emergency stop" button (AUB or KSP in the case of SM74) 2S10		No. 27	2EVM1-X1S: 1 / ZSK-X31: 1
S2	Bottom finger guard 2S24 *additionally for SM74*: upper finger guard 2S25, guard "Washup device" 2S66, guard "Inking unit" 2S67, door sheet reversing device / changeover 2S2		No. 28	2EVM1-X1S: 2 / ZSK-X31: 2
S3	Guard "Dampening rollers" (GTOZ-S), guard "Inking or dampening rollers" (SM74) 2S29		No. 28	2EVM1-X1S: 3 / ZSK-X31: 3
S4	Crank handle 2S31		No. 28	2EVM1-X1S: 4 / ZSK-X31: 4
S5	Guard "Plate cylinder" 2S28		No. 29	2EVM1-X1S: 5 / ZSK-X31: 5
S6	Cylinder guard "Transfer cylinder" 2S6		No. 30	2EVM1-X1S: 6 / ZSK-X31: 6
S7	Monitoring of clamping mechanism of sheet reversing device 2S5	SM74	No. 16	2EVM1-X1S: 7 / ZSK-X31: 7
S8				2EVM1-X1S: 8 / ZSK-X31: 8
S9				2EVM1-X1S: 9 / ZSK-X31: 9
S10				2EVM1-X1S: 10 / ZSK-X31: 10

Steuerung Automatische Wendeumstellung

Stadler, 13.10.94

Art	Bezeichnung/Funktion	Element	Automat.-(1) stufe: 0.	1.	2.	Ein-/Ausgänge: CPT compact: G2	M2	CPT modular: GS,MS,SP	Verdrahtung: 1=vor Wdg, 2=nach Wdg, 15=Schlüger. GS	MS	SP95	Bemerkungen	MC
Eingänge	Tür Fehlbogen	Reed-Schalter	x	x	x	P1054	P1065	E61	17	1	-	kein Betrieb, kein Tippen	H.Helmstädter
	Tür Wendung	Reed-Schalter	x	x		-	P2002	E62	2	2	-	kein Betrieb, kein Tippen	H.Müller, Robert
	Handkurbel	Endschalter	x	x	x	P0054	P2031	E31	2	2	-	kein Betrieb, kein Tippen, Bremse gelüftet	H.Eberhard
	Stellwelle/Klinke	Endschalter		x		-	P2040	E60	2	2	2	Stellung 2 der Stellwelle (öffnet Klemmungen, betätigt Klaue Formteinst.)	H.Wippert
	Klinke Formateinstellung (Klaue)	Sensor	x	x	x	P1006	P1018	E18	2	2	2	verhindert motorische Bewegung, wenn Speichertrommelklemmung geschlossen	H.Engimeier
	Überwachung Umstellung dynamisch	SUM 8 (2)	(x)	x	x	P1002	P2003	E38	1	1	2	Stellungsüberwachung Wendetrommel- Speichertrommel im Betrieb (0 = Fehler)	H.Gette
	Überwachung Umstellung statisch	SUM 8 (2)		x	x	P1005	P2001	E64	2	2	2	Stellungsüberwachung Wendetrommel- Speichertrommel während des Umstellvorganges (0 = Fehler)	H.Koch
	Wendetrommel	Endschalter	x	x	x	P1004	P1005	E36	1	1	2	Erkennung Widerdruckstellung (am Zahnsegment Speichertrommel)	H.Bernau
	Kurvenrolle Wendung	Endschalter	x	x	x	P1003	P2004	E35	2	2	2	Erkennung welche Kurvenrolle eingestellt ist	H.Buck
	Fehlbogenüberwachung	Schnüffelkolben	x	x	x	P1001	P1018	E18	1	1	2	Erkennung verlorengegangener Bogen	H.Schulz
	Fehlbogenüberwachung	Lichtauge	x	x	x	-	-	E11/14	-	-	2	Erkennung verlorengegangener Bogen	H Dr.Müller
	Klemmung Wendung (allgemein)	Endschalter	x			-	P2005	E41	-	-	2		
	Hydraulikdruck 0 10bar	Drucksensor		x	x	P1007	P2005	E41	-	2	2		
	Hydraulikdruck 1 35bar	Drucksensor		x	x	P1008	P2037	E33	2	2	2	alle hydraulischen Klemmungen geschlossen	
	Hydraulikdruck 2 100bar	Drucksensor		x	x	P1009	P2038	E34	2	2	2	Öffnung der Klemmungen : Speichertrommel	
	Ölstand Hydraulik	Sensor		x	x	P1010	P2039	E10	2	2	2	Öffnung der Klemmungen : Speichertrommel, Zahnsegment, Wendetrommel	
	Tippen Wendezylinder	Taster	x	x	x	-	-	E39	-	-	2		
	Arretierung Wendetrommel	Sensor			x	P1056	P2036	E11	2	2	2	zum Wählen des Wendezylinders	
Ausgänge	Hydraulik Druck 1 35bar	Magnetventil		x	x	P1078	P2081	A04	2	2	2	Überwachung Arretierung Wendetrommel	
	Hydraulik Druck 2 100 bar	Magnetventil / SUM 8 (2)		x	x	P1079	P2082	A05	2	2	2	Öffnung der Klemmungen : Speichertrommel	
	Klinke Formateinstellung (Klaue)	Magnetventil		x	x	P1080	P2083	A13	1	1	2	Öffnung der Klemmungen : Speichertrommel, Zahnsegment, Wendetrommel, Kupplung Greiferstrg.	
	Verriegelung Tür Wendung	Magnetventil		x		-	P2084	A15	2	2	-	bringt Klaue in Einrast-Position	
	Verriegelung Handkurbel	Magnet-Kupplung		x		-	P2084	A15	-	-	2	verhindert Öffnen der Tür Wendung	
	Kupplung Motor	Magnetventil			x	P1098	P0042	A13, A14	15	15	15	verhindert Einrasten der Handkurbel, während aut. Umstellvorgang	
	Arretierung Wendetrommel				x	P1100	P2084	A15	2	2	2	Ansteuerung über VSM im Schaltgerät. Bei 2 Wendungen = 2 Ausgänge erforderlich	
Motor	Umstellung	Bl-Hilfsantrieb 300W			x	LTM 300	LTM 300	LTM 300/LTK500	15	15	15		
Tache	Umstellwinkel	HVI			x	TEM(3)	TEM(3)	TEM(3)	15	15	15		

(1) Automatisierungsstufen:
0. = Keine Automatik (heutige Serienlösung)
1. = Halbautomatik
2. = Vollautomatik

(2) SUM 8 = Signalumsetzmodul
verknüpft 2 Sensoren und 1 Ausgang zu 2 Signalen
nicht bei MS, da Absicherung über Endschalter, der auf beide Eingänge verdrahtet wird

(3) Erfassen des Taches über Tacheerweiterungs-Modul (H.Thomas)

0... ZSK
1... EUK1
2... EUK2

ZSK

Inputs/outputs: feeder, delivery, PU1, central control cabinet

1.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
D1				
D2				
D3				
D4				
D5	Sensor "Front lay control ANK"	1B129		•
D6				
D7	Sensor "Front lay control FÜK"	1B129		•
D8				
1/E	Sensor "Pull lay control O.S." (optional for SM52-1)	1B1		•
2/E	Sensor "Pull lay control D.S." (optional for SM52-1)	1B2		•
3/E	Motor overload switch "Front edge blowers", "Sheet decurler", "Blower bar delivery", "Sheet slowdown", "Blower bar sheet turning device"	15Q73		•
4/E				
5/E	Signal "Malfunction UV dryer"	SEM	STA	•
6/E	Signal "Emergency stop"	SEM	STA	•
7/E	Earth-leakage monitor module	IWM		•
8/E	Sensor "Blanket washup device, washup solution level"	B8	E9	•
9/E	Sensor "Inking roller washup device, washup solution level"	B9	E9	•
10/E	Sensor "Blanket washup device, water level"	B10	E9	•
11/E	Sensor "Grease level"	15B11		•
12/E	"Emergency stop" button feeder	11S12		•
13/E	Button "Run"	11S13		•
14/E	Button "Compressor on/off"	11S14		•
15/E	Button "Paper on/off"	11S15		•
16/E	Button "Feeder on/stop"	11S16		•
17/E	Button "Raising the sheet stop fingers"	11S17		•
18/E	Button "Forward"	11S18		•
19/E	Button "Safe"	11S19		•
20/E	Button "Production run"	11S20		•
21/E	Button "Fast"	11S21		•
22/E	Button "Slow"	11S22		•
23/E	Button "Suction air plus"	11S23		•
24/E	Button "Suction air minus"	11S24		•
25/E	Button "Dampening rollers on"	11S25		•
26/E	Button "Main pile up"	11S26		•
27/E	Button "Main pile down"	11S27		•
28/E	Switch "Pile stop"	11S28		•
29/E	Button "Auxiliary pile on/off"	11S29		•
30/E	Button "Auxiliary pile up"	11S30		•
31/E	Button "Auxiliary pile down"	11S31		•
32/E	Button "Press stop"	11S32		•
33/E	Limit switch "Suction head limitation and paper safety"	11S33		•

1.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
34/E	Limit switch "Main pile at upper stop"	11S34		•
35/E	Limit switch "Main pile at bottom stop"	11S35		•
36/E				
37/E	Limit switch "Auxiliary pile at upper stop"	11S37		•
38/E	Limit switch "Auxiliary pile at bottom stop"	11S38		•
39/E	Limit switch "Pile support plate limitation"	11S39		•
40/E	Sensor "Pile merging"	11B40		•
41/E	Sensor "Single-sheet / shingle"	11B41		•
42/E	Sensor "Changeover main/auxiliary pile"	11B42		•
43/E	Sensor "Sucker position"	11B43		•
44/E	Sensor "Washup device PU1"	1B44		•
45/E	Limit switch "Guard front lays O.S."	1S45		•
46/E				
47/E				
48/E	Sensor "Plate cylinder coarse register adjustment PU1"	1B48		•
49/E	Switch "Adjusting the dampening rollers O.S."	1S49		•
50/E	Button "Washing the dampening rollers / overdampening O.S."	1S50		•
51/E	Limit switch "Finger guard PU1"	1S51		•
52/E	Limit switch "Guard plate cylinder PU1"	1S52		•
53/E	Limit switch "Guard dampening rollers PU1, O.S."	1S53		•
54/E	Limit switch "Crank handle"	1S54		•
55/E	Sensor "Dampening solution control PU1"	1B55		•
56/E				
56/E	Pressure switch "Grease lubrication O.S."	1S56		•
57/E	Limit switch "Guard inking unit PU1"	1S57		•
58/E	Button "Washing the ink fountain roller"	1S58		•
59/E	Sensor "Delivery pile full"	12B59		•
60/E	Limit switch "Removal of inspection sheet"	12S60		•
61/E	Sensor "Safety mechanism sheet jogger, light barrier receiver"	12B61		•
62/E	Limit switch "Upper pile stop O.S."	12S62		•
63/E	Limit switch "Bottom pile stop O.S."	12S63		•
64/E	Limit switch "Guard of numbering device"	12S64		•
65/E	Limit switch "Overshooting control", "Plexiglass guard"	12S65a,12S65		•
66/E	Limit switch "Stacking rake D.S."	12S66		•
67/E	Signal "Malfunction powder spray device" (not applicable to powder spray devices without interface)	12E2		•
68/E	Limit switch "Delivery non-stop"	12S68		•
69/A	Magnetic clutch "Feeder"	11Y69	via VSM	•
70/A				
71/A	Contactor "Pump for suction/blast air"	15K71M		•
72/A	Blow-off valve / pneumatic system compressor	Y2 (M74)		•
73/A	Contactor "Front edge blowers", "Sheet decurler", "Sheet slowdown", "Blower bar delivery"	15K73M		•
74/A	Contactor "Pneumatic system compressor"	15K74M		•
75/A	Signal "Emergency stop"	SAM	STA	•
76/A	Contactor "Blower powder spray device"	15K76M		•
77/A	Signal "Pile release"	SLM1, SLM2, SLM6		•

1.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
78/A	Contactor "Inking unit cooling" (optional)	15K78M		•
79/A	Contactor "Cooling and circulation dampening system" (optional)	15K79M		•
80/A	Signal "Paper in PU1 during production run"	SAM	STA	•
81/A	Signal "Dryer on/off"	SAM	STA	•
82/A	Signal "Radiators on/off"	SAM	STA	•
83/A	Contactor "Press run"	15K83a		•
84/A	Contactor "Grease pump"	15K84M		•
85/A	Signal "Printed sheets in delivery"	SAM	STA	•
86/A				
87/A	Signal lamp "Dampening rollers on"	15Y87		•
88/A	Signal lamp "Compressor on"	11H88		•
89/A	Signal lamp "Paper on"	11H89		•
90/A	Signal lamp "Feeder on"	11H90		•
91/A	Signal lamp "Pile release"	11H91		•
92/A	Signal lamp "Malfunction"	11H92		•
93/A	Signal lamp "Auxiliary pile on"	11H93		•
94/A	Signal lamp "Safe"	11H94		•
95/A				
96/A	Valve "Suction air"	11Y96		•
97/A	Valve "Suction air / changeover"	11Y97		•
98/A	Valve "Total amount of air"	1Y98		•
99/A	Valve "Drying impression cylinder"	1Y99		•
100/A				
101/A	Valve "Swinging the blanket washup device into position"	1Y101		•
102/A	Valve "Air supply / washup solution container"	1Y102		•
103/A	Valve "Inking roller washup device, washup solution supply"	1Y103		•
104/A	Valve "Throwing on the ink blade"	1Y104		•
105/A	Valve "Inking roller washup device, water"	1Y105		•
106/A	Valve "Blanket washup device, washup solution"	1Y106		•
107/A	Valve "Blanket washup device, diaphragm"	1Y107		•
108/A	Valve "Locking the blanket washup device"	1Y108		•
109/A	Valve "Blanket washup device, water"	1Y109		•
110/A	Valve "Intermediate roller, ink off"	1Y110		•
111/A	Valve "Inking form rollers"	1Y111		•
112/A	Valve "Ink ductor PU1"	1Y112		•
113/A	Valve "Dampening rollers PU1"	1Y113		•
114/A	Valve "Impression throw-on stage 1"	1Y114		•
115/A	Valve "Impression throw-on stage 2"	1Y115		•
116/A	Valve "Sheet stop finger D.S."	1Y116		•
117/A	Valve "Gripper bar, transfer gripper blocking O.S."	1Y117		•
118/A	Valve "Opening the front clamping bar PU1"	1Y118		•
119/A	Valve "Opening the rear clamping bar PU1"	1Y119		•
120/A				
121/A	Valve "Control air / air supply"	1Y121		•
122/A	Valve "Contact pressure roller / rear edge of printing plate"	1Y122		•
123/A				
124/A				

1.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
125/A	Audible signal device "Delivery"	12H125		•
126/A	Valve "Numbering on"	12Y126		•
127/A	Valve "Impression on numbering device"	12Y127		•
128/A	Signal "Powder on – powdering cycle"	12E2		•
BR/E	Brake main drive	BLT		•

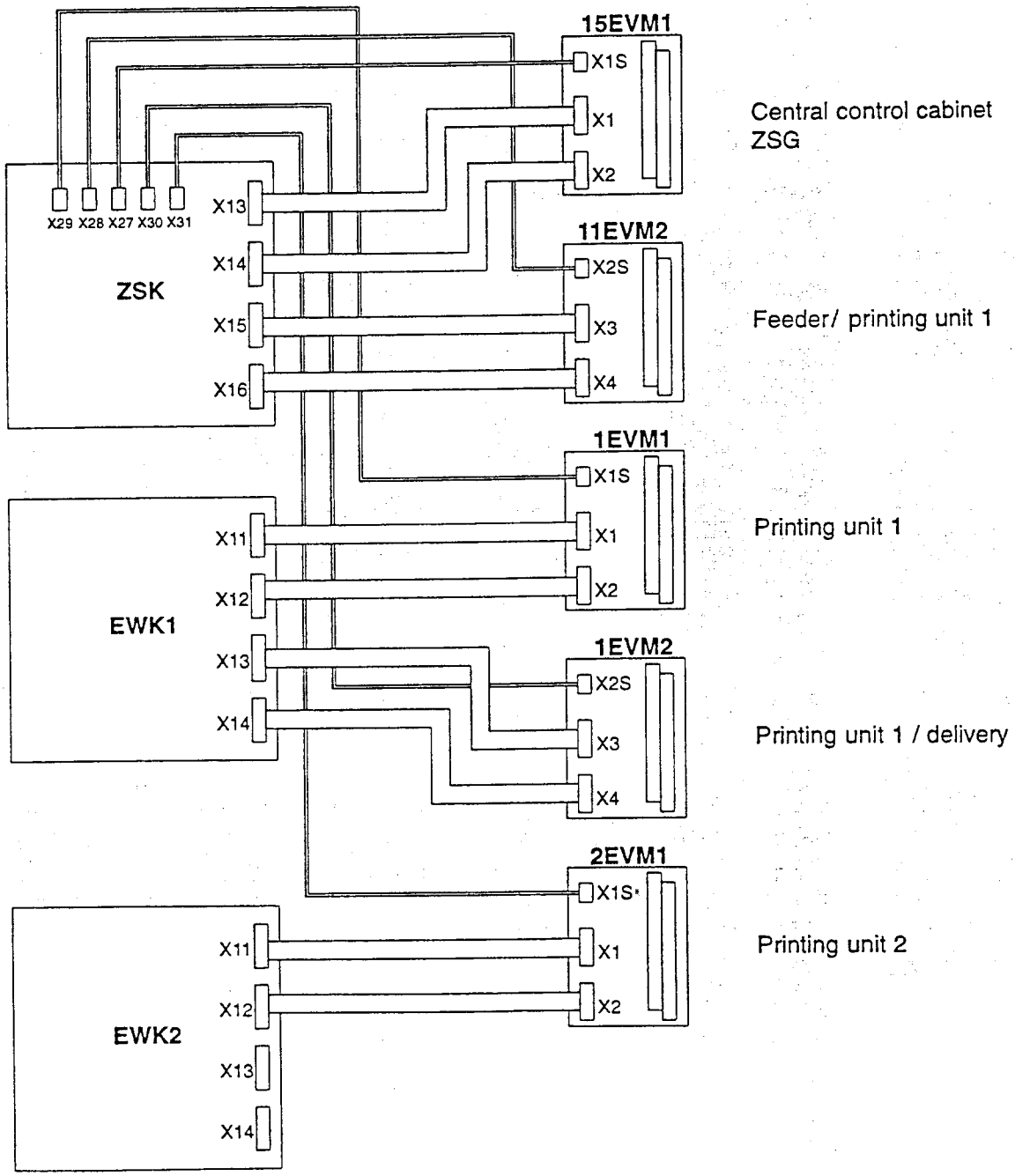
2.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
79/A	Valve "Hydraulic pressure 87 bars"	1Y79		•
80/A	Valve "Pawl / format adjustment"	2Y80		•
81/A	Contactor "Vacuum pump – sheet turning device" (only on perfector presses)	15K81M		•
82/A	Contactor "Blower / sheet turning device" (only on perfector presses)	15K82M		•
83/A				
84/A				
85/A	Signal lamp "Sheet counter"	12H85		•
86/A	Signal lamp "Inking form rollers on/off"	2H86		•
87/A	Signal lamp "Ink ductor on/off"	2H87		•
88/A	Signal lamp "Comressor on/off"	12H88		•
89/A	Signal lamp "Paper on/off"	12H89		•
90/A	Signal lamp "Delivery on/stop"	12H90		•
91/A	Signal lamp "Pile release"	12H91		•
92/A	Signal lamp "Malfunction" (red)	12H92		•
93/A	Signal lamp "Plate mounting"	2H93		•
94/A	Signal lamp "Safe PU2"	2H94		•
95/A	Signal lamp "Malfunction" (blue)	2H95		•
96/A				
97/A				
98/A	Magnetic clutch "Motor sheet turning device" (only on perfector presses)	2Y98		•
99/A	Auxiliary contactor "Release clutch / sheet reversing device" (only on perfector presses)	2Y99		•
100/A	Valve "Retention reversing drum" (only on perfector presses)	2Y100		•
101/A	Valve "Swinging the blanket washup device into position PU2"	2Y101		•
102/A	Valve "Locking the washup device PU2"	2Y102		•
103/A	Valve "Inking roller washup device, washup solution supply"	2Y103		•
104/A	Valve "Inking roller washup device, throwing on the ink blade"	2Y104		•
105/A	Valve "Inking roller washup device, water supply"	2Y105		•
106/A	Valve "Blanket washup device, washup solution PU2"	2Y106		•
107/A	Valve "Blanket washup device, diaphragm"	2Y107		•
108/A	Valve "Locking the blanket washup device"	2Y108		•
109/A	Valve "Blanket washup device, water"	2Y109		•
110/A	Valve "Intermediate roller, ink off PU2"	2Y110		•
111/A	Valve "Inking form rollers PU2"	2Y111		•
112/A	Valve "Ink ductor PU2"	2Y112		•
113/A	Valve "Dampening rollers PU2"	2Y113		•
114/A	Valve "Impression throw-on stage 1 PU2 O.S."	2Y114		•
115/A	Valve "Impression throw-on stage 2 PU2 O.S."	2Y115		•
116/A				
117/A				
118/A	Valve "Opening the front clamping bar PU2"	2Y118		•
119/A	Valve "Opening the rear clamping bar PU2"	2Y119		•
120/A				
121/A	Valve "Control air / air supply PU2"	2Y121		•
122/A	Valve "Contact pressure roller, rear edge of plate"	2Y122		•
123/A				

2.15EVM3 -XEA	Function	Equipment	Remarks	SM52 compact
124/A				
125/A				
126/A				
127/A				
128/A				

Input/output control

Interconnection diagram

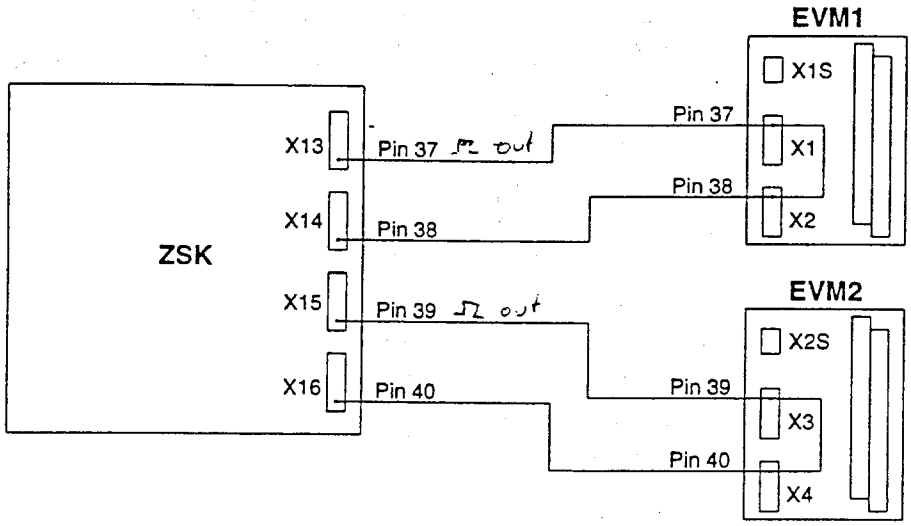
Overview of the connections between the central control board ZSK / extension boards EWK 1/2 and the input/output distributor modules EVM.



Interconnection diagram EWK, ZSK, EVM

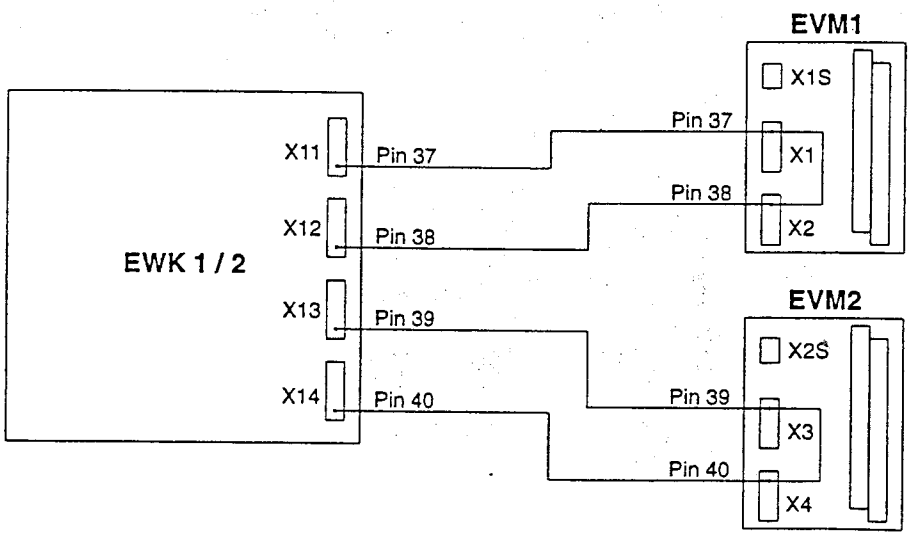
Loop leads

Central control board ZSK – input/output distributor module EVM 1/2



Interconnection diagram ZSK, EVM

Extension board EWK 1/2 – input/output distributor module EVM 1/2



Interconnection diagram EWK, EVM

Ein- Ausgabe-Modul Kompaktelektronik ~~EAM2~~ EVM2

von Stecker	Pin	nach Stecker	Pin	Bemerkungen
X2S	1	XEA	S 11	Sicherheitseingang
X2S	2	XEA	S 12	Sicherheitseingang
X2S	3	XEA	S 13	Sicherheitseingang
X2S	4	XEA	S 14	Sicherheitseingang
X2S	5	XEA	S 15	Sicherheitseingang
X2S	6	XEA	S 16	Sicherheitseingang
X2S	7	XEA	S 17	Sicherheitseingang
X2S	8	XEA	S 18	Sicherheitseingang
X2S	9	XEA	S 19	Sicherheitseingang
X2S X1S	10	XEA	S 20	Sicherheitseingang
X3	1	XEA	D 5	Differenzeingang
X3	2	XEA	D 6	Differenzeingang
X3	3	XEA	65	I/O-Port
X3	4	XEA	66	I/O-Port
X3	5	XEA	67	I/O-Port
X3	6	XEA	68	I/O-Port
X3	7	XEA	69	I/O-Port
X3	8	XEA	70	I/O-Port
X3	9	XEA	71	I/O-Port
X3	10	XEA	72	I/O-Port
X3	11	XEA	73	I/O-Port
X3	12	XEA	74	I/O-Port
X3	13	XEA	75	I/O-Port
X3	14	XEA	76	I/O-Port
X3	15	XEA	77	I/O-Port
X3	16	XEA	78	I/O-Port
X3	17	XEA	79	I/O-Port
X3	18	XEA	80	I/O-Port
X3	19	XEA	81	I/O-Port
X3	20	XEA	82	I/O-Port
X3	21	XEA	83	I/O-Port
X3	22	XEA	84	I/O-Port
X3	23	XEA	85	I/O-Port
X3	24	XEA	86	I/O-Port
X3	25	XEA	87	I/O-Port
X3	26	XEA	88	I/O-Port
X3	27	XEA	89	I/O-Port
X3	28	XEA	90	I/O-Port
X3	29	XEA	91	I/O-Port
X3	30	XEA	92	I/O-Port
X3	31	XEA	93	I/O-Port
X3	32	XEA	94	I/O-Port
X3	33	XEA	95	I/O-Port
X3	34	XEA	96	I/O-Port
X3	35			nicht belegt
X3	36			nicht belegt
X3	37	⇒		nicht belegt EVM1 Loop Leine
X3	38			nicht belegt
X3	39	X4	40	Schleifenleitung
X3 X1	40			nicht belegt
X4	1	XEA	D 7	Differenzeingang
X4	2	XEA	D 8	Differenzeingang
X4	3	XEA	97	I/O-Port
X4	4	XEA	98	I/O-Port
X4	5	XEA	99	I/O-Port
X4	6	XEA	100	I/O-Port
X4	7	XEA	101	I/O-Port
X4	8	XEA	102	I/O-Port
X4	9	XEA	103	I/O-Port
X4	10	XEA	104	I/O-Port
X4	11	XEA	105	I/O-Port
X4	12	XEA	106	I/O-Port
X4	13	XEA	107	I/O-Port
X4	14	XEA	108	I/O-Port
X4	15	XEA	109	I/O-Port
X4	16	XEA	110	I/O-Port
X4	17	XEA	111	I/O-Port
X4	18	XEA	112	I/O-Port
X4	19	XEA	113	I/O-Port
X4	20	XEA	114	I/O-Port
X4	21	XEA	115	I/O-Port
X4	22	XEA	116	I/O-Port
X4	23	XEA	117	I/O-Port
X4	24	XEA	118	I/O-Port
X4	25	XEA	119	I/O-Port
X4	26	XEA	120	I/O-Port
X4	27	XEA	121	I/O-Port
X4	28	XEA	122	I/O-Port
X4	29	XEA	123	I/O-Port
X4	30	XEA	124	I/O-Port
X4	31	XEA	125	I/O-Port
X4	32	XEA	126	I/O-Port
X4	33	XEA	127	I/O-Port
X4	34	XEA	128	I/O-Port
X4	35			nicht belegt
X4	36			nicht belegt
X4	37			nicht belegt
X4	38	⇒		nicht belegt Loop Leine EVM1
X4	39			nicht belegt
X4 X2	40	X3	39	Schleifenleitung

ZSK
EWK

Stadler S. 2. 94

Leitungsverteiler

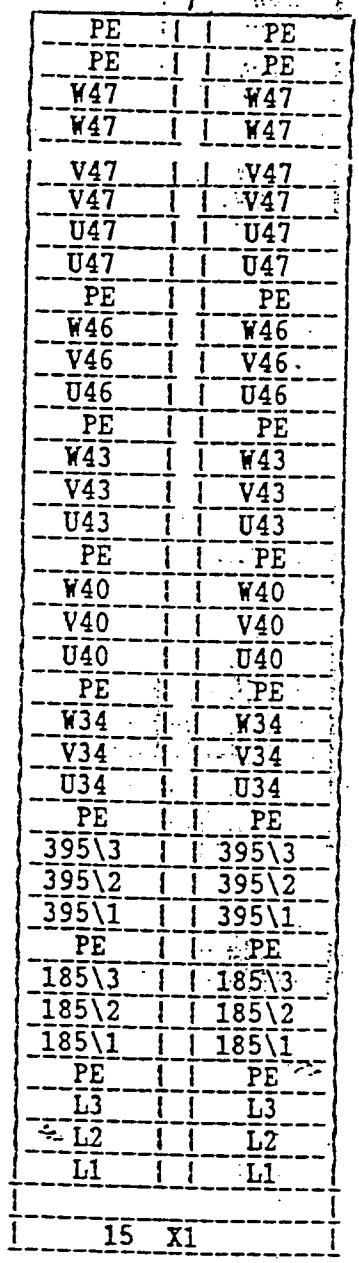
Klemmleiste 1LVT1 X2

	1LVT1 X2		
	220	220	1LVT1 X1:A1
	220	220	
	N2	N2	1LVT1 X1:B2
	N2	N2	
	211	211	1LVT1 X1:A3
	211	211	
	N4	N4	1LVT1 X1:B3
	N4	N4	
M36 X1:	+9	+9	1LVT1 X1:C2
Lüfter 2	+9	+9	Lüfter 1
Lüfter 4	+9	+9	Lüfter 3
Lüfter 6	+9	+9	Lüfter 5
Lüfter 8	+9	+9	Lüfter 7
	+9	+9	
12E2 X :2	-9	-9	1LVT1 X1:C4
Lüfter 2	-9	-9	Lüfter 1
Lüfter 4	-9	-9	Lüfter 3
Lüfter 6	-9	-9	Lüfter 5
Lüfter 8	-9	-9	Lüfter 7
	-9	-9	
12X10:1A1	+1	+1	
ANB (Betrieb)	+1	+1	ANB 11H16 X9:1
DWB1 (Vorwärts)	+1	+1	11LVT1 X1:(MAK)
DWB2 (Vorwärts)	+1	+1	AUB (Lampe Stapel)
	25* +1 Klemmen		
12X10:1A2	+2	+2	1LVT1 X1:A2
ANB (Lampe Kompr.)	+2	+2	AUB (Lampe Stapel)
DWB1 (1H47)	+2	+2	
DWB2 (2H47)	+2	+2	
	+2	+2	
	+2	+2	
12X10:1B2	-1	-1	1LVT1 X1:B1
MID1 X1:1	-1	-1	11LVT1 X1:(MAK)
MID2 X1:1	-1	-1	1B32
1B43	-1	-1	1B42
	-1	-1	
	-1	-1	
	-1	-1	
	-1	-1	
	-1	-1	
	-1	-1	
	-1	-1	
	-1	-1	
M36 X1:	36	36	1LVT1 X1:A5
	36	36	
12E2 X :1	46	46	1LVT1 X1:C5
	46	46	
11E3 L1	55	55	1LVT1 X1:B4
	55	55	
1S9 (NOT AUS)	100	100	1S2
	100	100	
1S24 (NOT AUS)	102	102	1S25
1S66	102	102	1EVM1 XEA:S2
1S67	102	102	
	102	102	
2S24 (Fingers.)	103	103	2S25
	103	103	2EVM1 XEA:S2
2S66	103	103	
2S67	103	103	
12S86	104	104	1EVM2 XEA:S19
12S92	104	104	
11X3:4	137	137	1LVT1 X1:C1
	137	137	
12B141	141	141	1LVT1 X1:B5
	141	141	
Lüfter 12M4	613	613	Lüfter 12M6
Lüfter 12M5	613	613	Lüfter 12M7
Lüfter 12M8	613	613	Lüfter 12M10
Lüfter 12M9	613	613	Lüfter 12M11
	613	613	
	613	613	
12X10:1A6	611	611	Schalter Lüftergruppe 1
	611	611	
12X10:2B3	621	621	Schalter Lüftergruppe 2
	621	621	
12X10:2C4	631	631	Schalter Lüftergruppe 3
	631	631	
	631	631	
	631	631	
12X10:1A7	612	612	Poti Lüftergruppe 1
	612	612	
12X10:1A8	622	622	Poti Lüftergruppe 2
	622	622	
12X10:1A9	632	632	Poti Lüftergruppe 3
	632	632	

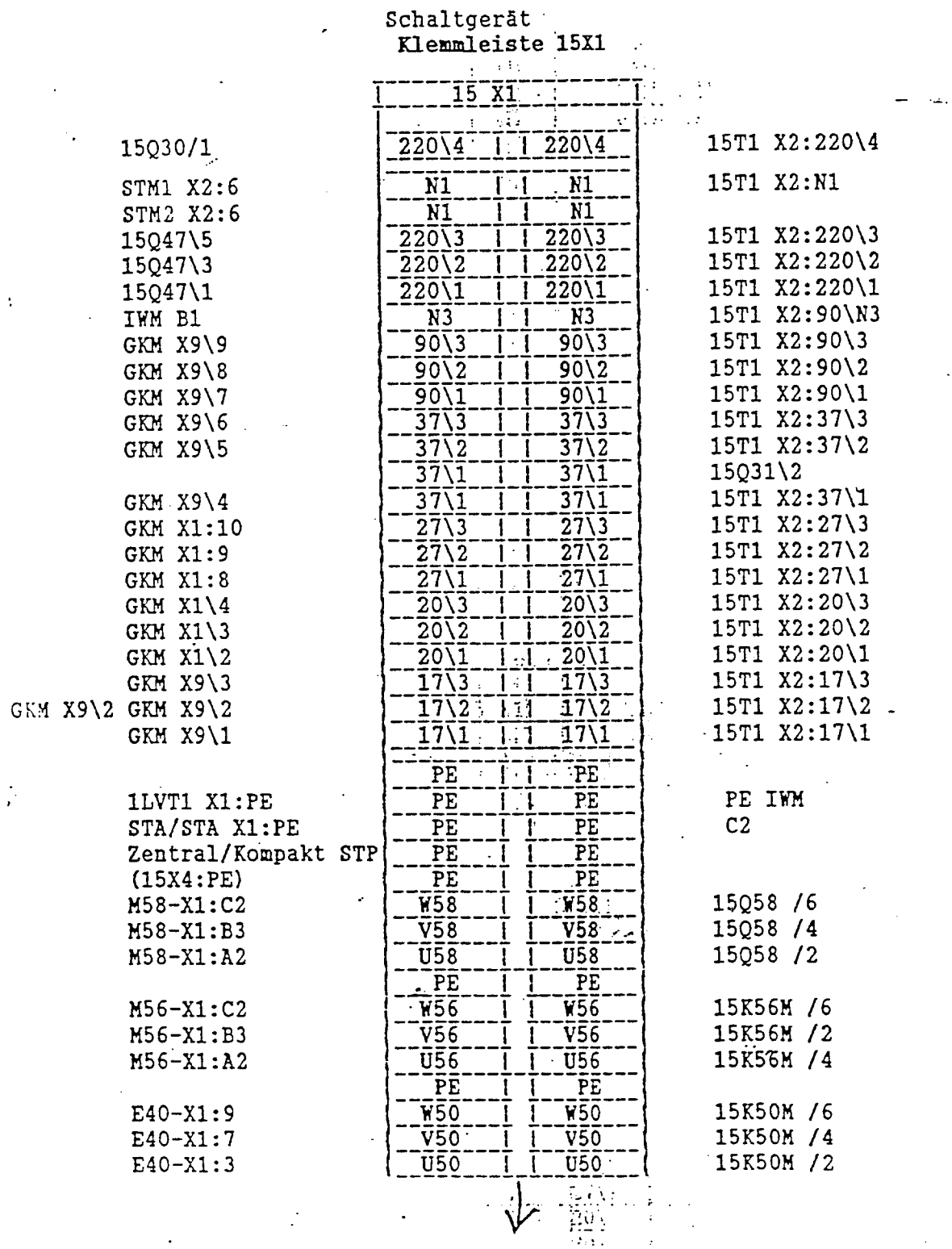
PFI ↑ PFL

ZSP-X1:B5	S1	S1	15EVM1 XEA:S1
	S1	S1	
	+5	+5	VSM X2:1
	+5	+5	NTM1
	-1	-1	
	-1	-1	
1LVT1 X1:B1	-1	-1	
E9LVT1 X1:-1	-1	-1	NTM2
Abschirmung(58)	-1	-1	NTM1
ZSP X1:B1 ;(12X10:1	-1	-1	VSM X2:9
	+2	+2	
	+2	+2	
	+3	+3	
1LVT1 X1:A2	+3	+3	15V1
	+1	+1	
	+1	+1	
	+1	+1	
1L /1/X1:A1	+1	+1	
ES /T1 X1:+1	+1	+1	Spule Schütz
STA SEM X1:+1 (SAM)	+1	+1	Motorschutzsch.
M58-X1:C4	+1	+1	IWM /14
15Q31\14	+1	+1	ZSP X1:A1 ;(12X10:1A1)
	-2	-2	
	-2	-2	
	-2	-2	
	-2	-2	
	-2	-2	
LTM11 X1:14	-2	-2	LTM113 X1:14
LTM9 X1:14	-2	-2	GKM X5:4
LTM7 X1:14	-2	-2	GKM X6:7
	+4	+4	
LTM11 X1:13	+4	+4	
LTM9 X1:13	+4	+4	LTM113 X1:13
LTM7 X1:13	+4	+4	GKM X6:1
	+6	+6	
	+6	+6	15K47 /13
LRM3 X1:7	+6	+6	LTM5 X1:7
LRM4 X1:7	+6	+6	GKM X5:1
	-9	-9	
1LVT1/X1:C4	-9	-9	GKM X4:3
	+9	+9	15K46M /13
1LVT1/X1:C2	+9	+9	GKM X4:1
Zentral/Kompakt STP	N4	N4	
STA/SEM X1:N4	N4	N4	
Zentral/Kompakt STP	211	211	15Q31/1
STA/SEM X1:211	211	211	
	N2	N2	
Lampe Schaltschr	N2	N2	15T1(PE)
1LVT1 X1:B2	N2	N2	15T1 X2:N2
STA/STA X1:N2	N2	N2	15RC2
	220	220	
Lampe Schaltschr	220	220	15K55A/43
1LVT1 X1:C3	220	220	15Q30/2
STA/STA X1:220	220	220	IWM
	15 X2		

	15 X2		
CPC1	704	704	15K55A :14
	704	704	
CPC1	703	703	15K55A :13
	703	703	
15C68	224	224	M34 X1:2
	224	224	
15K34\14	223	223	M34 X1:3
	223	223	
M58 X1:B1	142	142	EWK1 X40:13
	142	142	
1LVT1/X1:B5	141	141	12B141
	141	141	
1LVT1/X1:C1	137	137	15X2:137
	137	137	
5EVM1 XEA:57	57	57	BLT/TTK-X3:10
	57	57	
1LVT1/X1:B4	55	55	15K55A :44
	55	55	
15K47M /14	47	47	STM1 X2:19
	47	47	STM2 X2:19
1LVT1/X1:C5	46	46	15K46M :14
	46	46	
KLM X4:1	40	40	15EVM1 XEA:40
	40	40	
1LVT1/X1:A5	36	36	VSM X2:5
	36	36	
M58-X1:B5	35	35	15EVM1 XEA:35
	35	35	
E9 LVT1 X1:26	26	26	15EVM1 XEA:26
	26	26	
E9 LVT1 X1:25	25	25	15EVM1 XEA:25
	25	25	
E9 LVT1 X1:1	1	1	15EVM1 XEA:1
	1	1	
STA SAM X1:A8	A8	A8	15EVM1 XEA:46
	A8	A8	
STA SAM X1:A7	A7	A7	15EVM1 XEA:33
	A7	A7	
STA SAM X1:A6	A6	A6	15EVM1 XEA:63
	A6	A6	
STA SAM X1:A5	A5	A5	15EVM1 XEA:45
	A5	A5	
STA SAM X1:A4	A4	A4	15EVM1 XEA:52
	A4	A4	
STA SAM X1:A3	A3	A3	15EVM1 XEA:54
	A3	A3	
STA SAM X1:A2	A2	A2	15EVM1 XEA:53
	A2	A2	
STA SAM X1:A1	A1	A1	15EVM1 XEA:55
	A1	A1	
STA SEM X1:E5	E5	E5	Reserve
	E5	E5	
STA SEM X1:E4	E4	E4	Reserve
	E4	E4	
STA SEM X1:E3	E3	E3	15EVM1 XEA:4
	E3	E3	
STA SEM X1:E2	E2	E2	15EVM1 XEA:20
	E2	E2	
STA SEM X1:E1	E1	E1	15EVM1 XEA:12
	E1	E1	

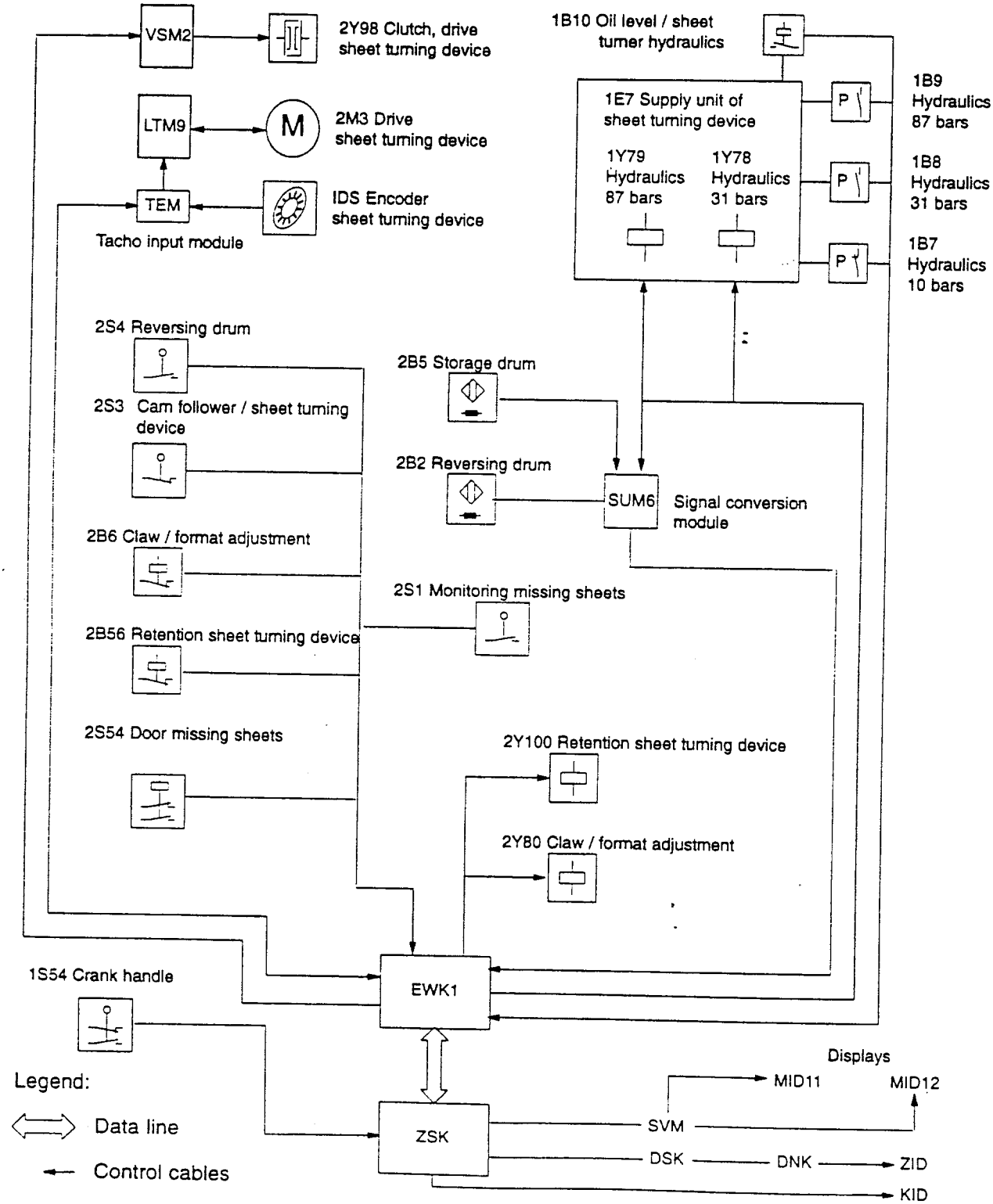


STM2 X2:24		
STM1 X2:24		15K47\6
STM2 X2:23		
STM1 X2:23		15K47\4
STM2 X2:22		
STM1 X2:22		15K47\2
M46-X1:C2		15K46M /6
M46-X1:B3		15K46M /2
M46-X1:A2		15K46M /4
M43-X1:C2		15K43M /6
M43-X1:B3		15K43M /2
M43-X1:A2		15K43M /4
15X3:W40		15L1\N3
15X3:V40		15L1\N2
15X3:U40		15L1\N1
M34-X1:9		15K34M /6
M34-X1:7		15K34M /2
M34-X1:3		15K34M /4
15Q65\6		15T1 X1:395\3
15Q65\4		15T1 X1:395\2
15Q65\2		15T1 X1:395\1
15Q69\3		15T1 X1:185\3
15Q69\2		15T1 X1:185\2
15Q69\1		15T1 X1:185\1
PE		PE 15T1
U Netz		15Q66\5
U Netz		15Q66\3
U Netz		15Q66\1


Schaltgerät
Klemmleiste 15X1
15 X1
15Q30/1
STM1 X2:6
STM2 X2:6
15Q47\5
15Q47\3
15Q47\1
IWM B1
GKM X9\9
GKM X9\8
GKM X9\7
GKM X9\6
GKM X9\5
GKM X9\4
GKM X1:10
GKM X1:9
GKM X1:8
GKM X1\4
GKM X1\3
GKM X1\2
GKM X9\3
GKM X9\2
GKM X9\1
GKM X9\2
1LVT1 X1:PE
STA/STA X1:PE
Zentral/Kompakt STP
(15X4:PE)
M58-X1:C2
M58-X1:B3
M58-X1:A2
M56-X1:C2
M56-X1:B3
M56-X1:A2
E40-X1:9
E40-X1:7
E40-X1:3
220\4 220\4
N1 N1
N1 N1
220\3 220\3
220\2 220\2
220\1 220\1
N3 N3
90\3 90\3
90\2 90\2
90\1 90\1
37\3 37\3
37\2 37\2
37\1 37\1
37\1 37\1
27\3 27\3
27\2 27\2
27\1 27\1
20\3 20\3
20\2 20\2
20\1 20\1
17\3 17\3
17\2 17\2
17\1 17\1
PE PE
PE PE
PE PE
PE PE
PE PE
W58 W58
V58 V58
U58 U58
PE PE
W56 W56
V56 V56
U56 U56
PE PE
W50 W50
V50 V50
U50 U50
15T1 X2:220\4
15T1 X2:N1
15T1 X2:220\3
15T1 X2:220\2
15T1 X2:220\1
15T1 X2:90\N3
15T1 X2:90\3
15T1 X2:90\2
15T1 X2:90\1
15T1 X2:37\3
15T1 X2:37\2
15Q31\2
15T1 X2:37\1
15T1 X2:27\3
15T1 X2:27\2
15T1 X2:27\1
15T1 X2:20\3
15T1 X2:20\2
15T1 X2:20\1
15T1 X2:17\3
15T1 X2:17\2
15T1 X2:17\1
PE IWM
C2
15Q58 /6
15Q58 /4
15Q58 /2
15K56M /6
15K56M /2
15K56M /4
15K50M /6
15K50M /4
15K50M /2

Sheet turning device

Block diagram

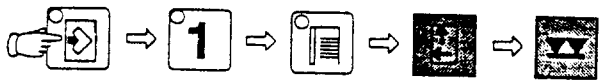


Block diagram: sheet turning device

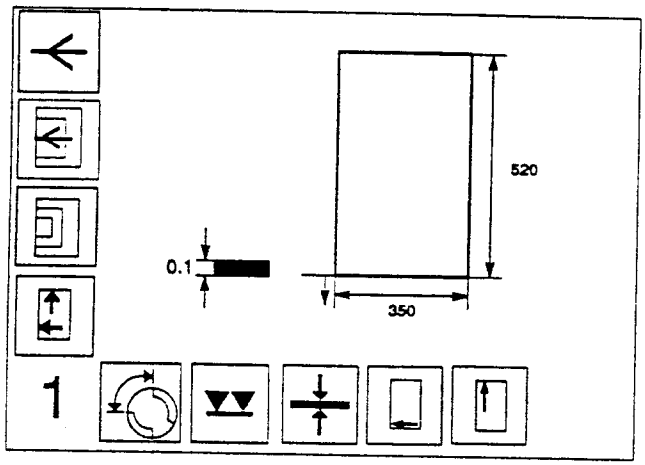
The following functions can be carried out with the software-supported sheet turning device:

- changeover from straight printing to perfecting,
- sheet-length change in perfecting mode,
- changeover from perfecting to straight printing,
- sheet-length change in straight printing mode.

To carry out the mentioned functions, the operator needs the command "Job preparation" of the electronic control system.



Selecting the command



Command in the KID

Operating mode "Straight printing" 

By pressing the button allocated to this symbol, the operating mode "Straight printing" can be preselected in the command "Job preparation".

Operating mode "Straight printing/perfecting" 

By pressing the button allocated this symbol, the operating mode "Straight printing/perfecting" can be preselected in the command "Job preparation".

Symbol "Format adjustment" 

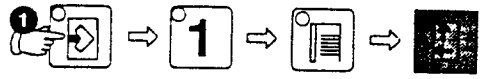
By pressing the button allocated to this symbol, the storage drum is adjusted to the required format in the two operating modes mentioned.

Caution:

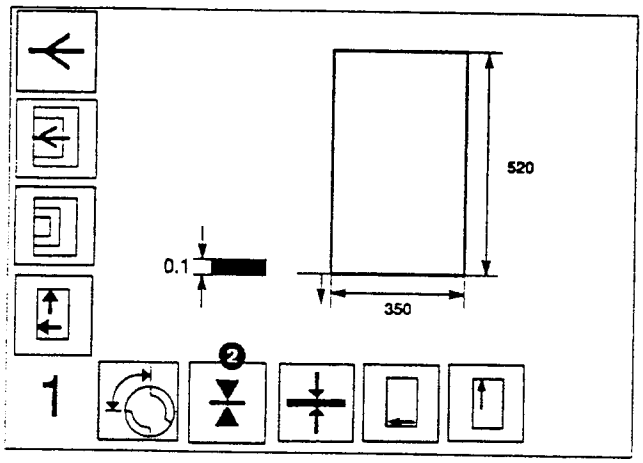
Do not change the preset values of the pressure reducers on the supply unit. A change of the values can result in serious damage to the press. The pressure reducers have been set to the required values at the factory.

Sequence of functions during changeover

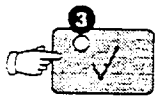
Changeover from straight printing to straight printing/perfecting



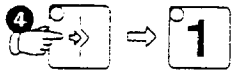
Selecting the command



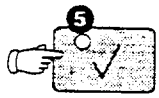
Command in the KID



Button "*Input*"



Selecting the command "Position"



Button "*Input*"

❶ Select the command "Job preparation".

❷ Select "Changeover from straight printing to straight printing/perfecting".

❸ Press the button "Input".

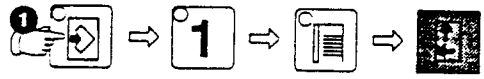
❹ Select the command "Position". Select the job.

❺ Press the button "Input". The job-related data is retrieved from the data memory.

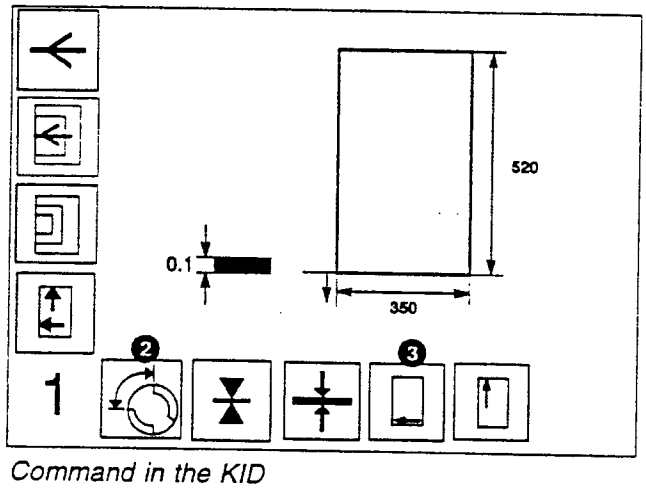
- The start-up warning sounds.
- The press moves to just before the point for the mechanical retention of the reversing drum.
- The retention device for the sheet turning device is lowered (pneumatic valve 2Y100 actuated).
- The electric clutch 2Y98 at the auxiliary drive 2M3 is activated.
- The auxiliary drive 2M3 turns the press backward so that the retention engages with the reversing drum. After this operation, the lever of the retention device rests against a mechanical stop of the reversing drum.
- The claw "Format adjustment" is lowered (pneumatic valve 2Y80 actuated).
- All clamping mechanisms (storage drum, gear segment, reversing drum) are open (pneumatic valve 1Y79 actuated).
- The auxiliary drive 2M3 turns the sheet turning device backward so that the claw "Format adjustment" engages with the bolt of the storage drum.
- The auxiliary drive 2M3 positions the sheet turning device to the entered sheet length.
- All clamping mechanisms (storage drum, gear segment, reversing drum) close (pneumatic valve 1Y79 not actuated).

- The retention device returns to its initial position (pneumatic valve 2Y100 not actuated).
- The claw "Format adjustment" returns to its initial position (pneumatic valve 2Y80 not actuated).
- The position switch 2S3 "Cam follower / sheet turning device" is actuated.
- The position switch 2S4 "Reversing drum" is actuated.
- The electric clutch 2Y98 at the auxiliary drive 2M3 is no longer activated.
- The changeover is completed.

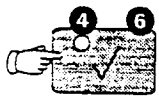
Sheet-length change in perfecting mode



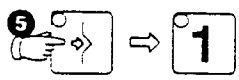
Selecting the command



Command in the KID



Button "*Input*"



Selecting the command "Position"

❶ Select the command "Job preparation".

❷ Select the function "Sheet-length change in perfecting mode".

❸ Enter the sheet length, if necessary.

❹ Press the button "Input".

❺ Select the command "Position". Select the job.

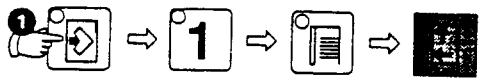
❻ Press the button "Input". The job-related data is retrieved from the data memory.

- The start-up warning sounds.
- The press moves to just before the point for the mechanical retention of the reversing drum.
- The retention device for the sheet turning device is lowered (pneumatic valve 2Y100 actuated).
- The claw "Format adjustment" is lowered (pneumatic valve 2Y80 actuated).
- The clamping mechanism of the storage drum is open (pneumatic valve 1Y78 actuated).
- The electric clutch 2Y98 at the auxiliary drive 2M3 is activated.

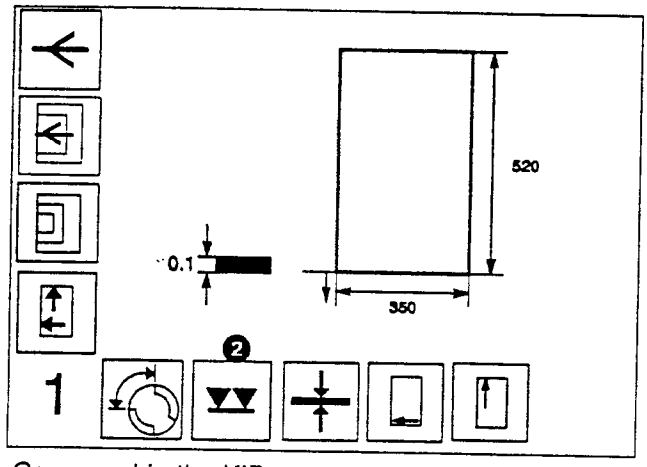
Sequence of functions during changeover

- The auxiliary drive 2M3 turns the press backward so that the retention engages with the reversing drum. After this operation, the lever of the retention device rests against a mechanical stop of the reversing drum.
- All clamping mechanisms (storage drum, gear segment, reversing drum) are open (pneumatic valve 1Y79 actuated).
- The auxiliary drive 2M3 turns the sheet turning device backward so that the claw "Format adjustment" engages with the bolt of the storage drum.
- The auxiliary drive 2M3 positions the sheet turning device to the entered sheet length.
- All clamping mechanisms (storage drum, gear segment, reversing drum) close (pneumatic valve 1Y79 not actuated).
- The retention device returns to its initial position (pneumatic valve 2Y100 not actuated).
- The claw "Format adjustment" returns to its initial position (pneumatic valve 2Y80 not actuated).
- The electric clutch 2Y98 at the auxiliary drive 2M3 is no longer activated.
- The sheet-length change is completed.

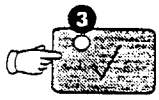
Changeover from straight printing/perfecting to straight printing



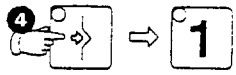
Selecting the command



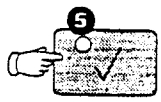
Command in the KID



Button "*Input*"



Selecting the command "Position"



Button "*Input*"

❶ Select the command "Job preparation".

❷ Select "Changeover from straight printing/ perfecting to straight printing".

❸ Press the button "Input".

❹ Select the command "Position". Select the job.

❺ Press the button "Input". The job-related data is retrieved from the data memory.

– The start-up warning sounds.

– The press moves to just before the point for the mechanical retention of the reversing drum.

– The retention device for the sheet turning device is lowered (pneumatic valve 2Y100 actuated).

– The claw "Format adjustment" is lowered (pneumatic valve 2Y80 actuated).

– The clamping mechanism of the storage drum is open (pneumatic valve 1Y78 actuated).

– The electric clutch 2Y98 at the auxiliary drive 2M3 is activated.

– The auxiliary drive 2M3 turns the sheet turning device backward so that the retention engages with the reversing drum. After this operation, the lever of the retention device rests against a mechanical stop of the reversing drum.

– All clamping mechanisms (storage drum, gear segment, reversing drum) are open (pneumatic valve 1Y79 actuated).

- The auxiliary drive 2M3 moves the sheet turning device to the stored position to engage the claw "Format adjustment" with the bolt of the storage drum.

1st variant:

The button "Format adjustment" is actuated before the changeover:

- The auxiliary drive 2M3 positions the sheet turning device to the entered sheet length.

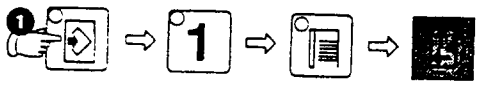
2nd variant:

The button "Format adjustment" is not actuated before the changeover:

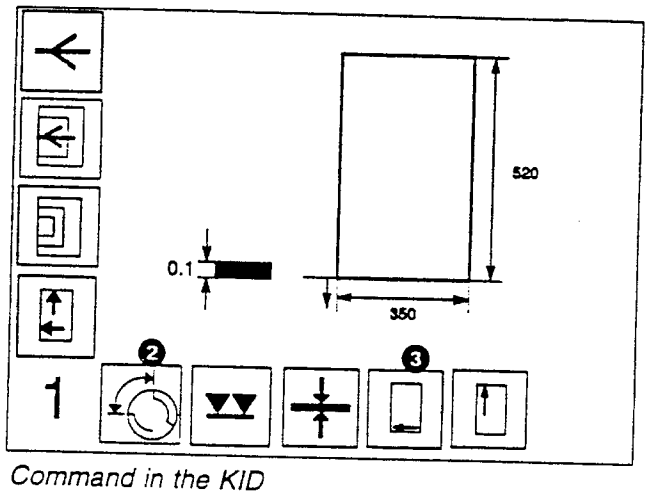
- The auxiliary drive 2M3 positions the sheet turning device to the nominal sheet size.
- The claw "Format adjustment" returns to its initial position (pneumatic valve 2Y80 not actuated).
- The auxiliary drive 2M3 moves the sheet turning device to just before the zero position of straight printing.
- The auxiliary drive 2M3 moves the sheet turning device slowly (reduced torque) to the zero position of straight printing and against a mechanical stop.
- The position switch 2S3 "Cam follower / sheet turning device" is not actuated.
- The position switch 2S4 "Reversing drum" is not actuated.
- All clamping mechanisms (storage drum, gear segment, reversing drum) close (pneumatic valve 1Y79 not actuated).
- The retention device returns to its initial position (pneumatic valve 2Y100 not actuated).

  The electric clutch 2Y98 at the auxiliary drive 2M3 is no longer activated.
- The changeover is completed.

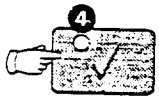
Sheet-length change in straight printing mode



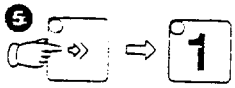
Selecting the command



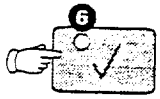
Command in the KID



Button "*Input*"



Selecting the command "Position"



Button "*Input*"

❶ Select the command "Job preparation".

❷ Select the function "Sheet-length change in straight printing mode".

❸ Enter the sheet length, if necessary.

❹ Press the button "Input".

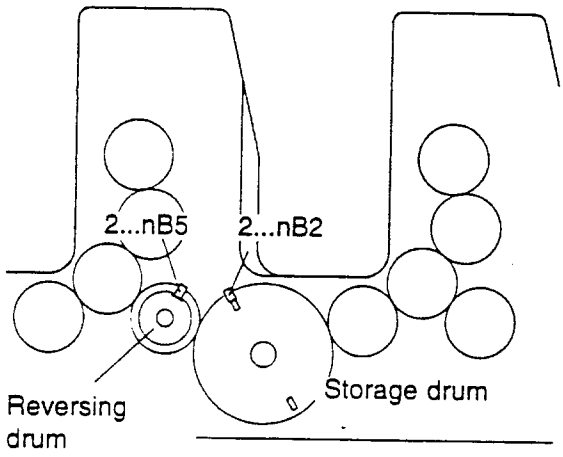
❺ Select the command "Position". Select the job.

❻ Press the button "Input". The job-related data is retrieved from the data memory.

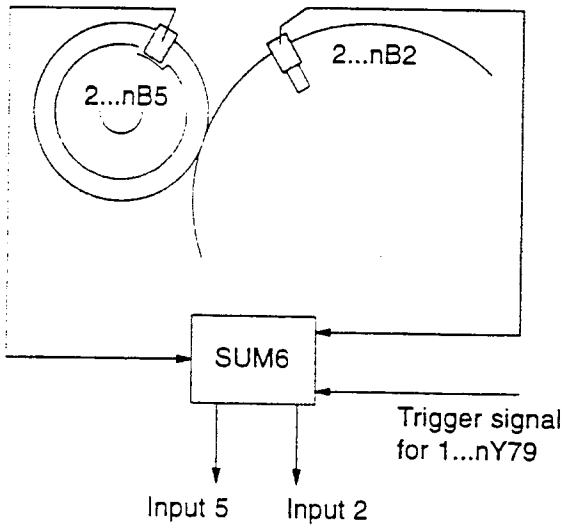
- The start-up warning sounds.
- The press moves to just before the bolt which serves to adjust the storage drum to the sheet length.
- The claw "Format adjustment" is lowered (pneumatic valve 2Y83 actuated).
- The clamping mechanism of the storage drum opens (pneumatic valve 2Y81 actuated).
- The press turns backward to engage the claw with the bolt.
- The press turns forward to adjust the storage drum to the maximum sheet length.
- The press turns backward and positions to the sheet length entered.
- The clamping mechanism of the storage drum closes (pneumatic valve 2Y81 not actuated).
- The claw "Format adjustment" returns to its initial position (pneumatic valve 2Y83 not actuated).
- The sheet-length change is completed.

Monitoring sheet turnaround

Function



Printing unit, operator side



Block diagram

The components monitoring sheet turnaround check the interaction between

- the grippers of the reversing drum and
- the suckers of the storage drum.

Monitoring occurs:

- during changeover and
- during press run in straight printing/perfecting mode.

The monitoring function is ensured by:

- the sensor "Storage drum" 2...nB2,
- the sensor "Reversing drum" 2...nB5,
- the signal conversion module SUM6 and
- the trigger signal for pneumatic valve 1...nY79.

The signal conversion module passes two signals to the electronic control system:

- monitoring of changeover,
- monitoring during press run.

Monitoring changeover

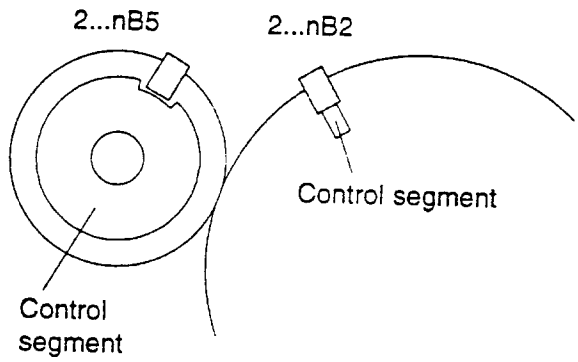
The electronic control system monitors the interaction between the grippers of the reversing drum and the suckers of the storage drum

- at the beginning of changeover,
- at the end of changeover.

For changeover monitoring (input 5) the following signals are combined with each other:

- the signals from sensor 2...nB2,
- the signals from sensor 2...nB5,
- the trigger signal for pneumatic valve 1...nY79.

At the beginning of changeover, sensor 2...nB5 must be above the recess in the segment disk. This ensures the correct zero position.



Correct position of reversing drum in relation to storage drum

After the changeover, "1" must be displayed at input 5 in the service display of the corresponding printing unit. The electronic control system checks the input after the following operating modes:

- changeover from straight printing to straight printing/perfecting,
- sheet-length change in perfecting mode.

Input 5 of the corresponding printing unit:

1 = changeover was carried out correctly.

0 = changeover was not carried out correctly; press cannot got on "Run".

Monitoring during press run

For monitoring during press run (input 2), the following signals are combined with each other:

- the signals from sensor 2...nB2,
- the signals from sensor 2...nB5.

During press run the two interrogation switches must never detect the corresponding control segment simultaneously (see ill.).

The signal conversion module SUM6 informs the electronic control system about the result of the evaluation.

Input 2 of the corresponding printing unit:

1 = transfer position between storage drum and reversing drum is O.K.

0 = transfer position between storage drum and reversing drum is not O.K.; press stops and cannot be put back into operation.

Actuation of "Emergency stop" button

Actuation of the "Emergency stop" button while the electronic control system positions the sheet turning device during changeover or a sheet-length change can have different effects. The effects and the measures to be taken are described below.

During sheet-length change in straight printing mode

If the emergency stop button is actuated during a sheet-length change in straight printing mode, it is possible that the format setting of the storage drum has already been modified. The entered sheet length has, however, not been reached yet. The claw "Format adjustment" returns to its initial position. The electronic control system does not know the present position of the bolt of the storage drum. For this reason, the electronic control system positions the storage drum during the next changeover first to the maximum sheet length and then towards the minimum sheet length. During this operation, the claw "Format adjustment" engages with the bolt of the storage drum.

After unlocking the emergency stop button, the operator should repeat the sheet-length change.

Sheet turning device between straight printing mode and perfecting

If the emergency stop button is actuated while the sheet turning device is between the zero position of straight printing and the zero position of perfecting, the correct interaction between the reversing drum and storage drum has not been established yet.

In the display "Presetting" or "Job preparation" the symbol "Changeover from straight printing/ perfecting to straight printing" appears.
The operator must re-initiate the changeover (press the green button "Input").

Sheet turning device in the perfecting zone

Actuation of the emergency stop button while the sheet turning device is positioned in the perfecting zone does not affect the correct interaction between the reversing drum and storage drum. The changeover can be completed.

Since the entered sheet length has not been reached yet, the symbol "Format error" appears in the display "Presetting" or "Job preparation". The operator can set the entered sheet size by activating the function "Sheet-length change in perfecting mode". The fault symbol goes off after the next changeover.

Power failure

A power failure which occurs while the electronic control system positions the sheet turning device during changeover or a sheet-length change can have different effects. The effects and measures to be taken are described below.

During a sheet-length change in straight printing mode

In the case of a power failure during a sheet-length change in straight printing mode, it is possible that the format setting of the storage drum has already been modified. The entered sheet length has, however, not been reached yet. The claw "Format adjustment" returns to its initial position. The electronic control system does not know the present position of the bolt of the storage drum. For this reason, the electronic control system positions the storage drum during the next changeover first to the maximum sheet length and then towards the minimum sheet length. During this operation, the claw "Format adjustment" engages with the bolt of the storage drum.

After unlocking the emergency stop button, the operator should repeat the sheet-length change.

Sheet turning device between straight printing mode and perfecting or in the perfecting zone

If a power failure occurs while the electronic control system

- moves the sheet turning device between the zero position of straight printing and the maximum sheet length of perfecting or
- positions the sheet turning device in the perfecting zone,

the actual position cannot be stored.

After turning on the main switch 15Q66, the operator must execute a program for the basic setting of the sheet turning device. For this purpose, he must select the command "Presetting" or "Job preparation". The following fault symbols will be displayed:

- "Changeover from straight printing/perfecting to straight printing",
- "Monitoring interaction reversing drum/storage drum".

Then the button "Input" on the control console must be pressed twice.

It is not possible to intervene in the program flow.

Program flow for basic setting of sheet turning device

- The retention device for the sheet turning device is lowered (pneumatic valve 2Y100 actuated).
- The electric clutch 2Y98 at the auxiliary drive 2M3 is activated.
- The auxiliary drive 2M3 positions the press so that the retention engages with the reversing drum.
- All clamping mechanisms (storage drum, gear segment, reversing drum) are open (pneumatic valve 1Y79 actuated).
- The auxiliary drive 2M3 positions the sheet turning device to the zero position of straight printing.
- The claw "Format adjustment" is lowered (pneumatic valve 2Y80 actuated).
- The auxiliary drive 2M3 positions the sheet turning device to the minimum format of perfecting so that the claw "Format adjustment" can engage with the bolt of the storage drum.
- The auxiliary drive 2M3 positions the sheet turning device to the nominal format of perfecting.
- The claw "Format adjustment" returns to its initial position (pneumatic valve 2Y80 not actuated).
- The auxiliary drive 2M3 positions the sheet turning device to the zero position of straight printing.
- At the end of the program, the press is in straight printing mode, the storage drum has been positioned to the nominal format and the correct interaction between the reversing drum and storage drum has been established.

If there is an error in the program flow, the program must be started again. If the press remains blocked, it may be necessary to carry out a basic initialization.

After a mechanical repair

Attention:

Exclude any risk of collision between the grippers of the reversing drum and the suckers of the storage drum. Check the correct interaction between the reversing drum and storage drum by turning the press slowly (with the crank handle).

A mechanical repair of the sheet turning device can lead to a faulty interaction between the storage drum and reversing drum.

In the display of the command "Presetting" or "Job preparation" the following fault symbols appear:

- "Changeover from straight printing/perfecting to straight printing",
- "Monitoring interaction reversing drum/ storage drum".

A basic initialization may be necessary, if the correct interaction between the reversing drum and storage drum was altered manually during a repair.

The program for the basic setting of the sheet turning device must be initiated. For this purpose, the operator must select the command "Presetting" or "Job preparation". Then the button "Input" on the control console must be pressed twice.

At the end of the program

- the press is in straight printing mode,
- the storage drum has been positioned to the nominal format and
- the correct interaction between the reversing drum and storage drum has been established.

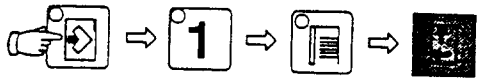
During execution of the program it can happen that the retention does not engage with the reversing drum. In the ZID/KID the following fault symbols appear:

- "Retention sheet turning device" and
- "Monitoring interaction reversing drum/ storage drum".

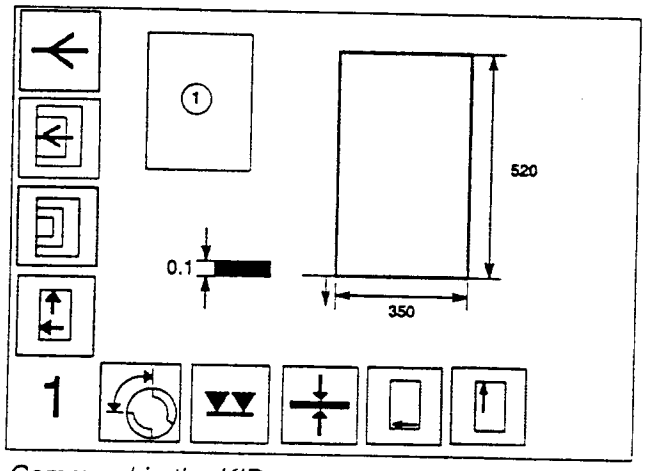
To eliminate the fault, the operator must turn the press carefully with the crank handle until the retention engages with the reversing drum. Then the program for the basic setting of the sheet turning device must be started again.

Fault displays

Command "Job preparation"



Selecting the command



Command in the KID

① Area where the fault symbols relative to changeover are displayed.

Depending on the malfunction, the symbols shown below can be displayed.

Fault symbol "Changeover from straight printing/ perfecting to straight printing"

Fault symbol "Monitoring interaction reversing drum/storage drum"

Fault symbol "Claw format adjustment"

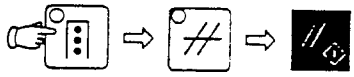
Fault symbol "Clamping mechanism (31 bars) storage drum"

Fault symbol "Clamping mechanisms (87 bars) storage drum/reversing drum"

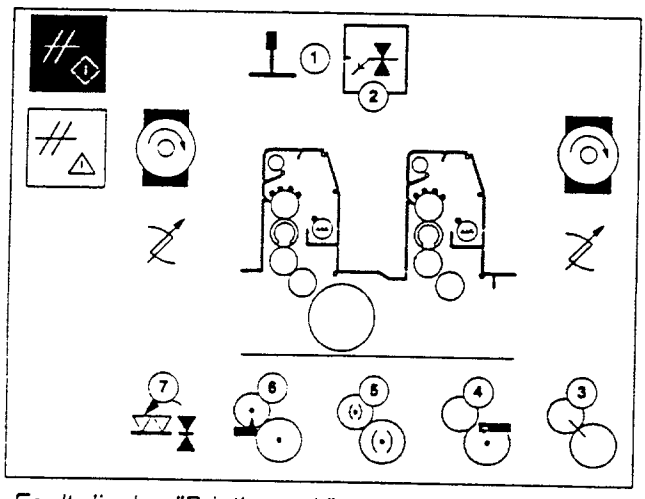
Fault symbol "Retention sheet turning device"

Fault symbol "Format error"

Display: "Printing unit – malfunction: press run not possible"



Selecting the display



Fault display "Printing unit"

① Fault symbol "Crank handle"

② Fault symbol "Sheet loss / sheet turning device"

③ Fault symbol "Monitoring interaction reversing drum/storage drum"

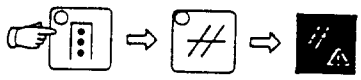
④ Fault symbol "Claw format adjustment"

⑤ Fault symbol "Clamping mechanisms (87 bars) storage drum/reversing drum"

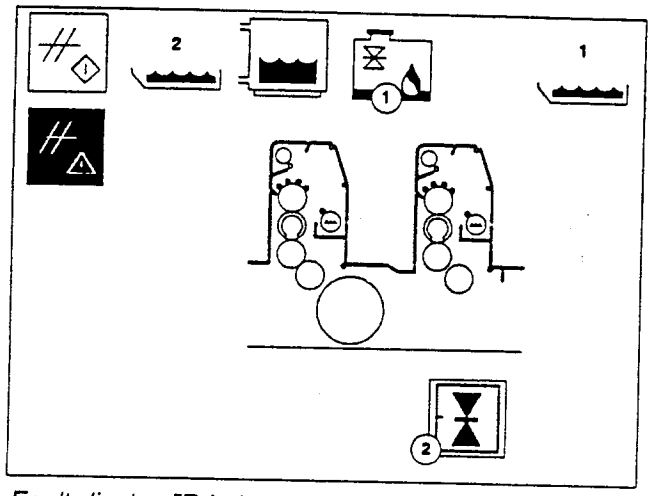
⑥ Fault symbol "Retention / sheet turning device"

⑦ Fault symbol "Changeover from straight printing/perfecting to straight printing"

Display: "Printing unit – malfunction: production run"



Selecting the display



Fault display "Printing unit

① Fault symbol "Oil level / sheet turner hydraulics"

② Fault symbol "Door missing sheets open"

Fault messages

Attention:

Exlude any risk of collision between the grippers of the reversing drum and the suckers of the storage drum. After each fault message concerning the interaction between the reversing drum and the storage drum, the sheet turning device must be checked.

During changeover/sheet-length change

Note:
The fault messages appear in the display "Sheet-size adjustment" or "Job preparation" while the changeover/sheet-length change is in progress.

Malfunction	Possible cause	Remedy	Note
The press does not turn. The fault symbol "Claw format adjustment" appears in the display "Sheet-size adjustment" or "Job preparation". 	The claw is not lowered to engage with the bolt.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve.	
	The claw does not return to its initial position.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve.	
	The sensor "Claw format adjustment" 2B6 is defective.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the electrical connections to the sensor. – Replace the sensor.	

Malfunction	Possible cause	Remedy	Note
The press does not turn. The fault symbol "Monitoring interaction reversing drum/storage drum" appears in the display "Sheet-size adjustment" or "Job preparation".	The claw returns to its initial position while changeover is in progress.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve.	
	The clamping mechanisms are open.	– Interrupt the command. – Change over to straight printing again. – Repeat the changeover or sheet-length change. – Mechanical parts are probably defective.	
The press does not turn. The fault symbol "Changeover from straight printing/ perfecting to straight printing" appears in the display "Sheet-size adjustment" or "Job preparation".	The claw is probably defective.	– Change over to straight printing again. The press is again ready to run in straight printing mode. – If the claw is not defective, repeat the changeover or sheet-length change.	
			
The press is blocked. The fault symbol "Clamping mechanism (31 bars) storage drum" appears in the display "Sheet-size adjustment" or "Job preparation".	The clamping mechanism of the storage drum (31 bars) does not open after being activated. The clamping mechanism of the storage drum (31 bars) closes during the changeover/sheet-length change.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve. – Check the position switch "Adjusting shaft/pawl".	
	The sensor "Hydraulics 31 bars" is defective.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the electrical connections to the sensor. – Replace the sensor.	

Malfunction	Possible cause	Remedy	Note
The press is blocked. The fault symbol "Clamping mechanisms (87 bars) storage drum/ reversing drum" appears in the display "Sheet-size adjustment" or "Job preparation". 	The clamping mechanisms of the storage drum (31 bars) and reversing drum (87 bars) do not open after being activated.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve. – Check the position switch "Adjusting shaft/pawl".	
	The sensor "Hydraulics 87 bars" is defective.	– Change over to straight printing. – Replace the sensor.	
The auxiliary drive 2M3 does not position. The fault symbol "Retention sheet turning device" appears in the display "Sheet-size adjustment" or "Job preparation". 	The retention device is not lowered.	– Interrupt the command. – Repeat the changeover or sheet-length change. – Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve. – Check the sensor "Retention sheet turning device".	
The press remains blocked. The fault symbol "Retention sheet turning device" appears in the display "Sheet-size adjustment" or "Job preparation". 	The retention device has not returned to its initial position after the changeover/sheet-length change.	– Check the electrical connections to the pneumatic valve. – Check the sensor "Retention sheet turning device".	

Malfunction	Possible cause	Remedy	Note
Emergency stop of press. The changeover/sheet-length change is interrupted. The fault symbol "Retention sheet turning device" appears in the display "Sheet-size adjustment" or "Job preparation".  The press remains blocked after switching it off/on.	The retention device has returned to its initial position during the changeover/sheet-length change.	– Check the electrical connections to the pneumatic valve. – Check the sensor "Retention sheet turning device". – Check the interaction between the reversing drum and storage drum. – Carry out a basic initialization since the fault message is stored.	
Emergency stop of press. The fault symbol "Format error" appears in the display "Sheet-size adjustment" or "Job preparation". 	Changeover was interrupted in the perfecting zone after actuation of the "Emergency stop" button. The storage drum has not reached the entered sheet length.	– Initiate the function "Sheet-length change in perfecting mode" in order to obtain the entered sheet length. – The fault display goes off during the next changeover/sheet-length change.	

While changeover/sheet-length change is not in progress

Note:
The fault messages appear in the display "Printing unit – malfunction: press run not possible" while changeover/sheet-length change is not in progress.

Malfunction	Possible cause	Remedy	Note
The press is blocked; press run and inching mode not possible. The fault symbol "Door missing sheets open" appears in the fault display. 	The door for removal of missing sheets is open.	– Close the door. – Check the position switch "Door missing sheets open".	
The press does not turn. The fault symbol "Claw format adjustment" appears in the fault display. 	The claw was lowered suddenly.	– Check the pneumatic valve. – Check the sensor "Claw format adjustment". – It could be that mechanical parts of the claw are defective.	
	After the changeover/sheet-length change the claw does not return to its initial position.	– Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve. – It could be that mechanical parts of the claw are defective.	
	The sensor "Claw format adjustment" is defective.	– Check the electrical connections to the sensor. – Replace the sensor.	

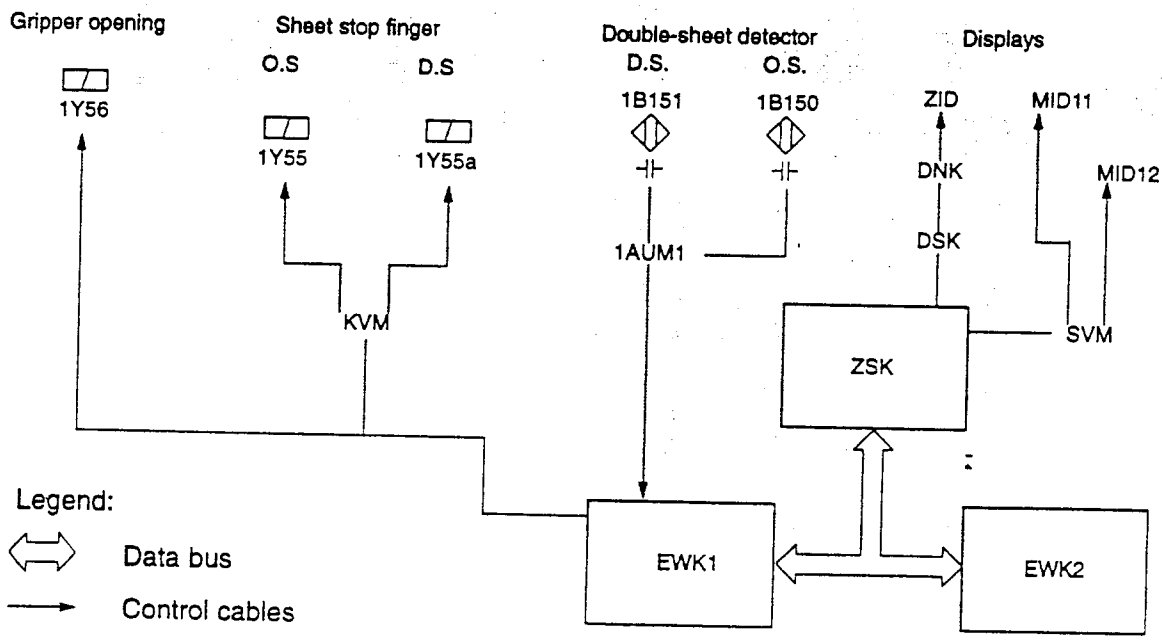
Malfunction	Possible cause	Remedy	Note
The press does not turn. The fault symbol "Monitoring interaction reversing drum/storage drum" appears in the fault display. 	The clamping mechanisms have opened or are defective. The interaction between the reversing drum and storage drum is no longer correct.	– Check the components monitoring sheet turn-around. – It could be that mechanical parts of the clamping mechanisms are defective. Repair and carry out a basic initialization; then change over to straight printing.	
	The clamping mechanisms are open.	– Change over to straight printing again. – Mechanical parts are probably defective.	
The press does not turn. The fault symbol "Clamping mechanisms (87 bars) storage drum/reversing drum" appears in the fault display. 	The clamping mechanisms do not close.	– Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve.	
	The sensor "Hydraulics 10 bars" is defective.	– Check the electrical connections to the sensor. – Replace the sensor.	
Emergency stop of press. The press cannot go on "Run. The fault symbol "Retention sheet turning device" appears in the display "Sheet-size adjustment" or "Job preparation". 	The retention device is lowered while the change-over/sheet-length change is not in progress.	– Check the pneumatic valve/ pneumatic connections. – Check the electrical connections to the pneumatic valve. – Check the sensor "Retention sheet turning device".	

Note:
The fault message appears in the display "Printing unit – malfunction: production run" while change-over/sheet-length change is not in progress.

Malfunction	Possible cause	Remedy	Note
The yellow signal lamp on the control console flashes. The fault symbol "Oil level / sheet turner hydraulics" appears in the fault display. 	Loss of hydraulic oil.	– Top up with hydraulic oil.	
	The sensor "Oil level / sheet turner hydraulics" is defective.	– Check the electrical connections to the sensor. – Replace the sensor.	

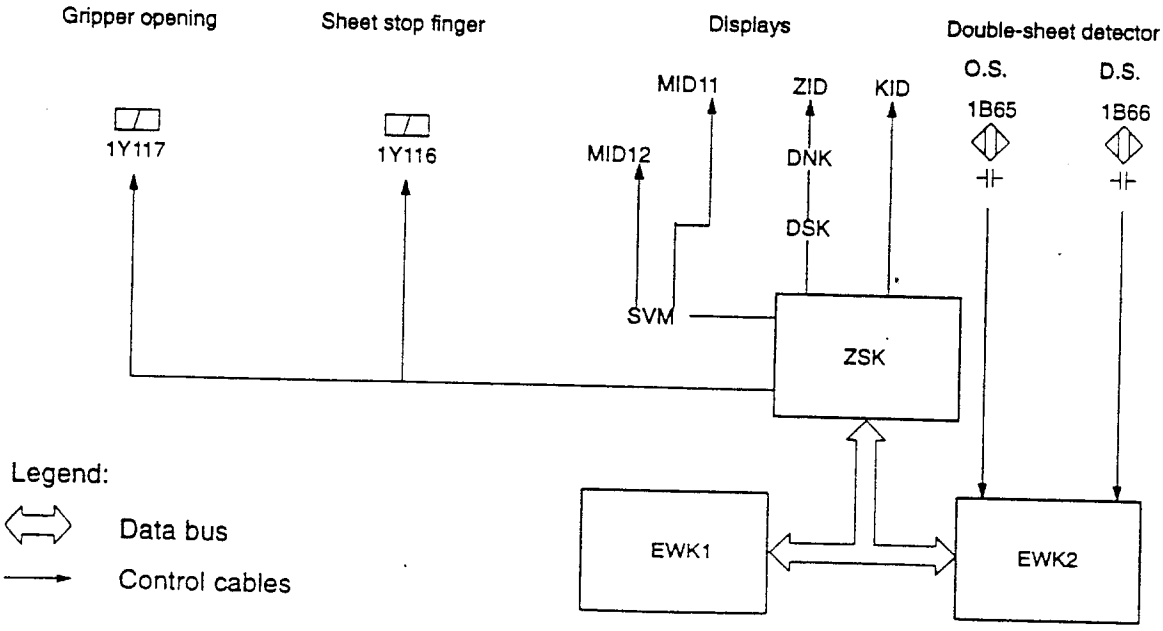
Double-sheet detector

Block diagram for SM74



Block diagram: double-sheet detector

Block diagram for SM52



Block diagram: double-sheet detector

The inductive sensor (1B65/1B66 or 1B151/1B150) of the double-sheet detector determines the thickness of the print sheet through indirect measurement. This measurement is carried out while the paper is being pulled. The measured value serving for evaluation is the distance between the sensor and the tilting lever of the pull lay. The analog signal (current) at the output of the sensor serves as measured quantity for the electronic control system.

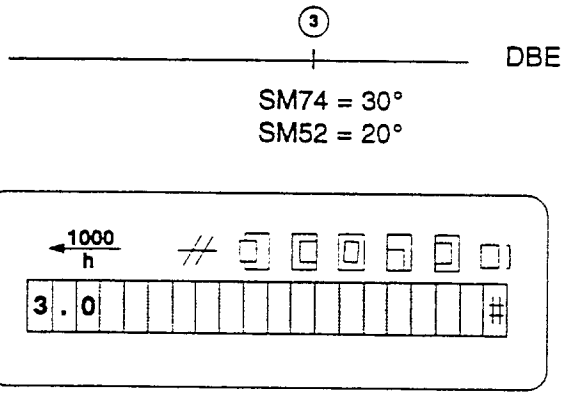
SM74 only:

On the analog conversion module AUM1 the single cores of each sensor are grouped together to a flat cable. The flat cables are led to the extension board EWK1. The analog signals of the sensors are digitized by an A/D converter on the EWK1.

SM52 only:

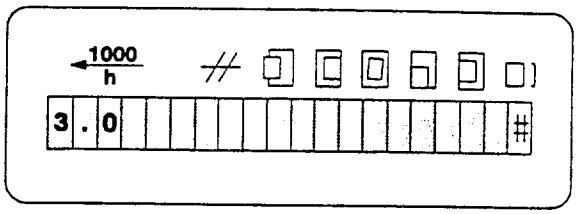
The sensors are directly connected with the plug for analog inputs of the EWK2. The analog signals of the sensors are digitized by an A/D converter on the EWK2.

The signals from the double-sheet detector are analyzed at press angle ③. The processor on the ZSK evaluates the digital signals. A double-sheet exists if the measured value is 1.5 times the paper thickness entered. If there is a double-sheet, the ZSK stops the feeder. The electronic control system reduces the press speed to 3000 i.p.h.. Simultaneously, the ZSK passes a fault message to the control console display ZID or to the compact information display KID and the press displays MID.



Degrees

Fault messages in the case of a double-sheet



MID after detection of a double-sheet

Press display MID

In the MID the fault symbol # appears under the pictogram for double-sheet.

Selection 

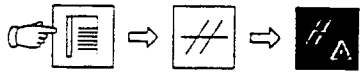
Control console display ZID

Selection of the display "Entire press" (production run display).

Symbol "Double-sheet detector" 

In this display the symbol "Double-sheet detector" appears when a sensor detects a double-sheet.

Selection and symbol

Selection 

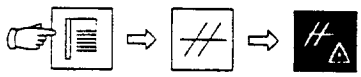
Selection of the display "Feeder/warning":

Symbol "Electronic double-sheet detector" 

In this display the symbol "Electronic double-sheet detector" appears when a sensor detects a double-sheet.

Selection and symbol

Compact information display KID

Selection 

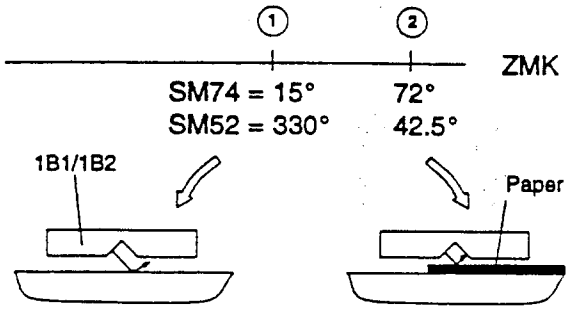
Selection of the display "Feeder – malfunction production run"

Symbol "Electronic double-sheet detector" 

In this display the symbol "Electronic double-sheet detector" appears when a sensor detects a double-sheet.

Selection and symbol

Explanations on the block diagram



Interrogation points

The pull lay control (ZMK) monitors the entire pull process, i. e. the correct sheet infeed and the pull end position.

The following applies to the degrees listed (see interrogation points):

- At ① and paper run:
  the ZMK must not detect any paper.
- At ② and paper run:
  the ZMK and ANK must detect paper.
- At ② and no paper run:
  the ZMK signal is not evaluated because the sheet alignment control does not detect any paper.

The reflex sensors on the drive and operator sides serve for paper detection. Depending on the pull direction only one of the two reflex sensors is necessary for monitoring.

The pull direction is entered in the command mode "Presetting". Only the reflex sensor of the active pull lay is interrogated.

In the signal conversion modules SUM1 and RL12 the signals from the reflex sensors are amplified. The circuit state of each sensor is signalled by an LED on the corresponding SUM1
(LED is lit = reflex sensor detects paper).

The electronic control system evaluates the signals of the signal conversion modules.
The signals from the amplifiers reach the central control board ZSK via

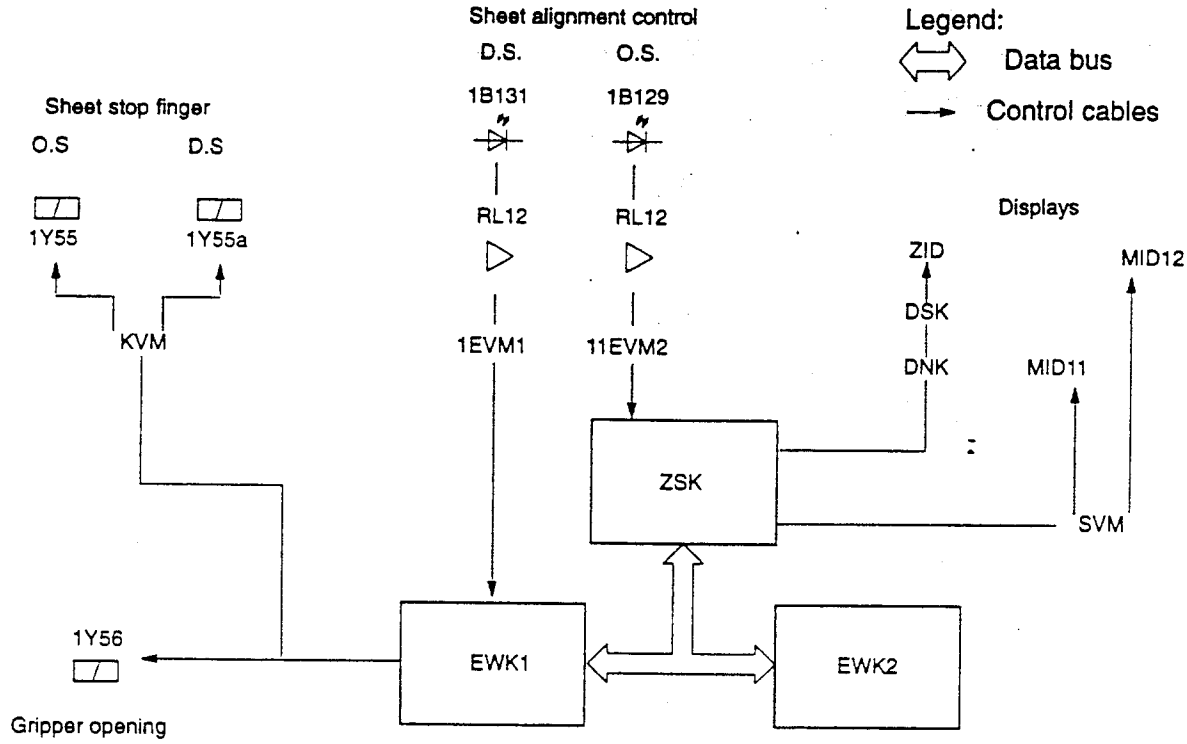
- the input/output distributor module 1EVM1 or 1.15EVM3,
- the extension board EWK (only SM74).

The ZSK evaluates the signals of the pull lay control. In the case of a pull or sheet infeed error, it passes the fault message

- to the control console display ZID or
- to the compact information display KID,
- to the press displays MID,
- to the audible signal devices 11H116/12H123 or 11H86/12H125.

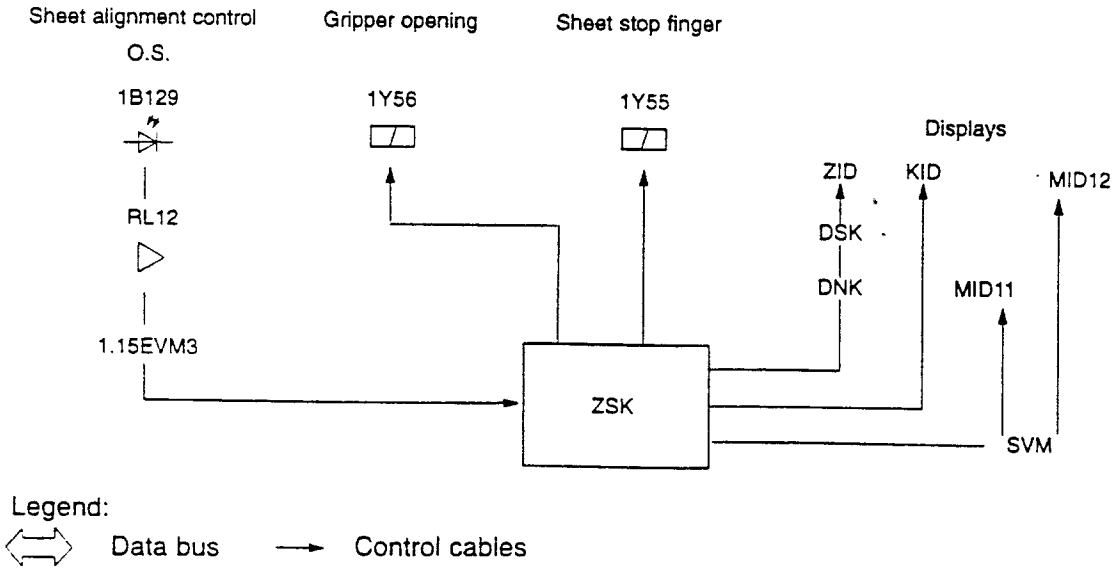
Sheet alignment control

Block diagram for SM74



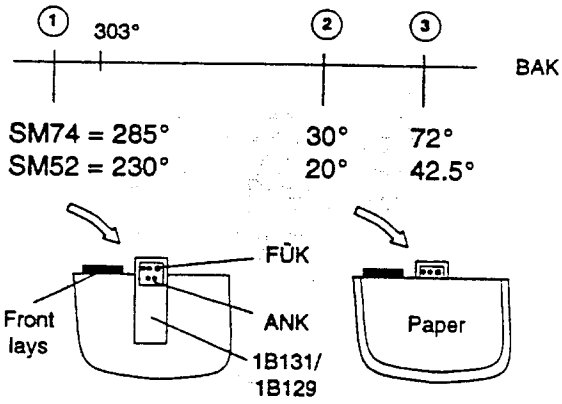
Block diagram: sheet alignment control

Block diagram for SM52



Block diagram: sheet alignment control

Explanations



Interrogation points

For correct sheet transfer from the feeder into the first printing unit the sheet must be placed against the front lays between ① and ②. Optimum sheet arrival (only SM74) occurs at 303°.

The following applies to the degrees listed (see interrogation points):

- At ① and paper run:
  the ANK must not detect paper.
- At ② and paper run:
  the ANK must detect paper.
- At ③ and paper run:
  to evaluate the information provided by the pull lay control (1B1/1B2) the ANK must detect paper.

The sensors (1B131 and 1B129) of the sheet alignment control register at which point of time the sheets arrive at the front lays. Each sensor housing contains an ANK and FÜK sensor.

ANK = sensor for sheet alignment control
FÜK = sensor for overshooting control

The signals of the sensors are transmitted to the amplifiers (RL12) where they are amplified.

The signals from the amplifiers reach the central control board ZSK via

- the input/output distributor modules 1EVM1, 11EVM2 or 1.15EVM3
- the EWK (only the signals from 1B131 on SM74).

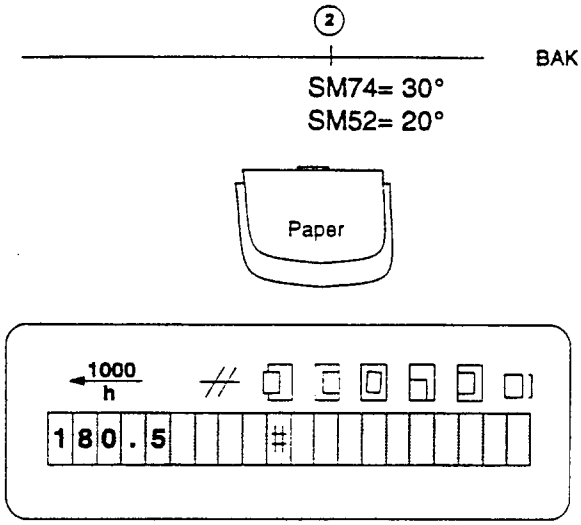
The ZSK evaluates the signals of the sheet alignment control. The evaluated signals are required for the following functions of the printing press:

- sheet alignment at the front lays,
- misaligned-sheet display (trend display),
- automatic sheet arrival control (servo-drive 1M7 on SM74).

The ZSK displays the result of the evaluation

- in the control console display ZID or
- in the compact information display KID
- and in the press displays MID.

Sheet alignment error detected by the FÜK sensors



Overshooting sheet

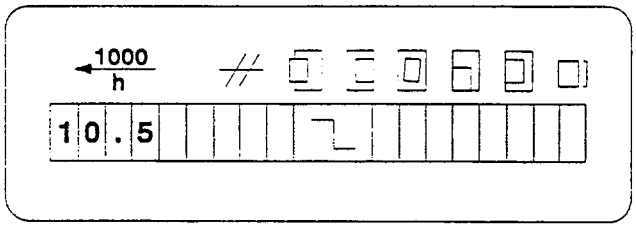
The FÜK sensors detect:

– overshooting sheets.

Given a continuous sheet flow, an overshooting sheet exists if one of the FÜK sensors detects paper at press angle ② .

The feeder and press stop immediately.
The shingled sheets remain on the feed table.

Misaligned-sheet display (trend display)



Display of misaligned sheet. Drive side advanced.

Good sheet
Optimum sheet arrival |

Misaligned sheet, D.S. advanced
Display of misalignment up to max. 18° ⌐

Misaligned sheet, O.S. advanced
Display of misalignment up to max. 18° ¬

During paper run or production run the misaligned-sheet display appears in the MID. This display changes permanently and is a trend indication for the operator. The misaligned-sheet display does not intervene in press control.

The ANK sensors of the sheet alignment control detect the misaligned sheet at the front lays. This misalignment between the drive side D.S. and the operator side O.S. is registered and converted into a degree value.

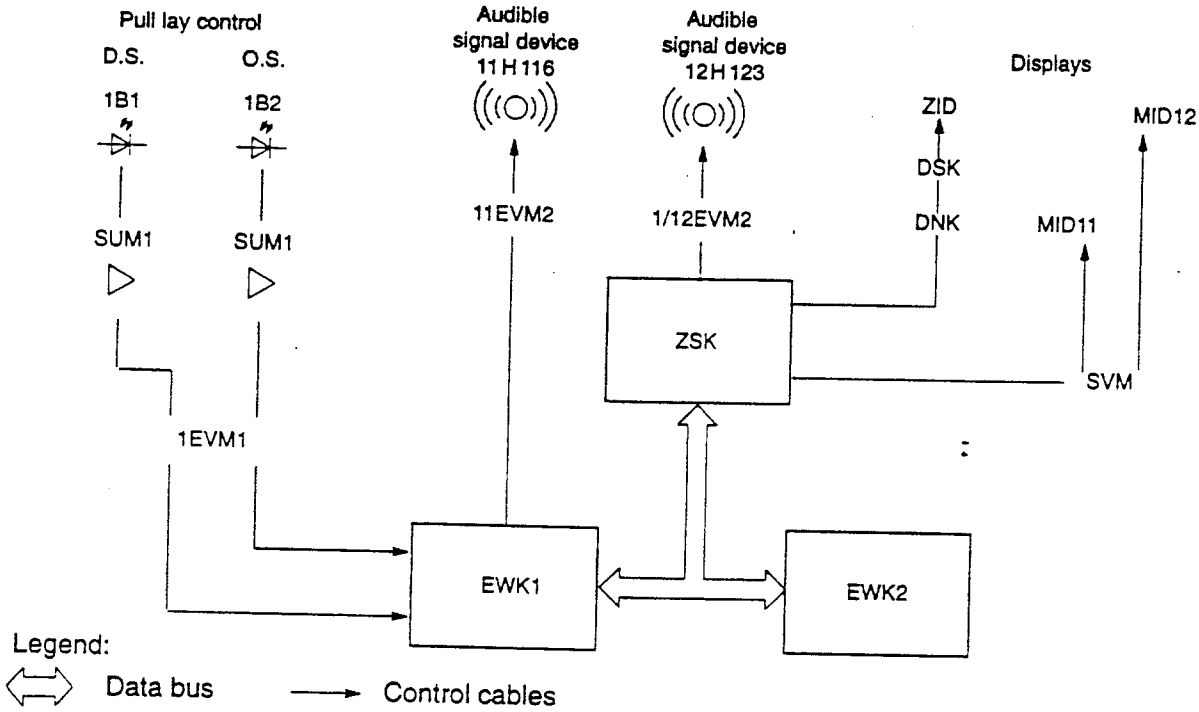
The degree value is represented as a line symbol in the MID (see ill.). The display is only visible if no settings, fault messages, malfunctions or other information are indicated in the MID.

Note:

The fault message "Misaligned sheet" and the misaligned-sheet display are not identical.

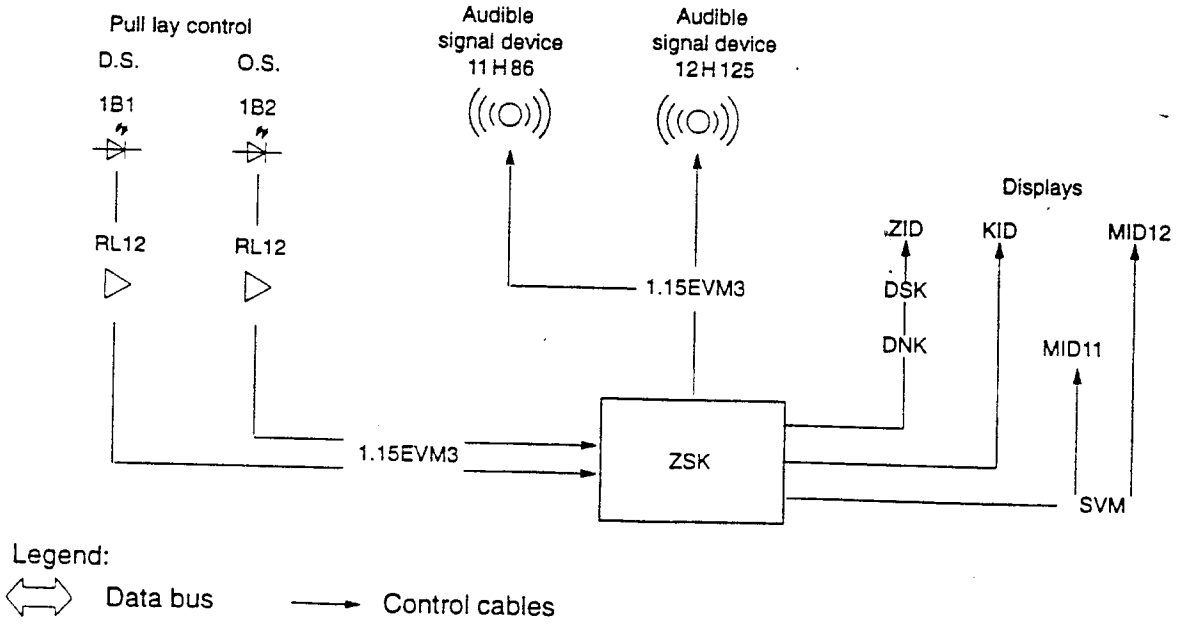
Pull lay control

Block diagram for SM74



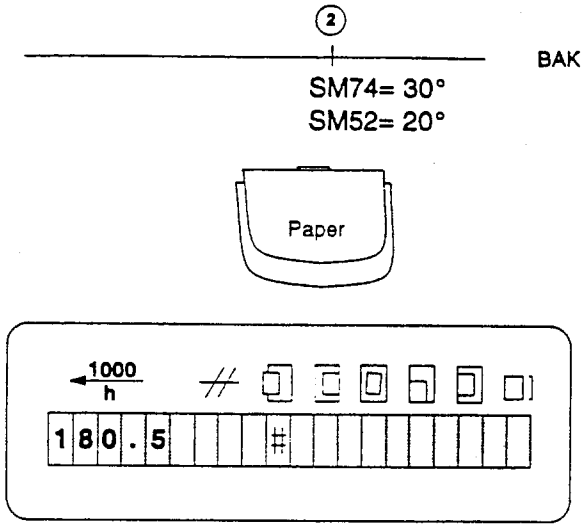
Block diagram: pull lay control

Block diagram for SM52



Block diagram: pull lay control

Sheet alignment error detected by the FÜK sensors



Overshooting sheet

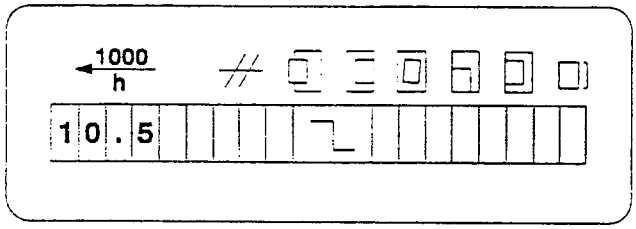
The FÜK sensors detect:

– overshooting sheets.

Given a continuous sheet flow, an overshooting sheet exists if one of the FÜK sensors detects paper at press angle ② .

The feeder and press stop immediately.
The shingled sheets remain on the feed table.

Misaligned-sheet display (trend display)



Display of misaligned sheet. Drive side advanced.

Good sheet
Optimum sheet arrival

Misaligned sheet, D.S. advanced
Display of misalignment up to max. 18°

Misaligned sheet, O.S. advanced
Display of misalignment up to max. 18°

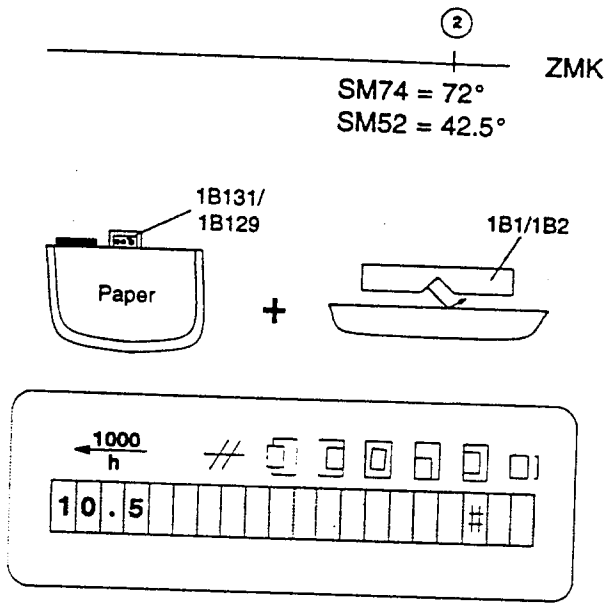
During paper run or production run the misaligned-sheet display appears in the MID. This display changes permanently and is a trend indication for the operator. The misaligned-sheet display does not intervene in press control.

The ANK sensors of the sheet alignment control detect the misaligned sheet at the front lays. This misalignment between the drive side D.S. and the operator side O.S. is registered and converted into a degree value.

The degree value is represented as a line symbol in the MID (see ill.). The display is only visible if no settings, fault messages, malfunctions or other information are indicated in the MID.

Note:

The fault message "Misaligned sheet" and the misaligned-sheet display are not identical.



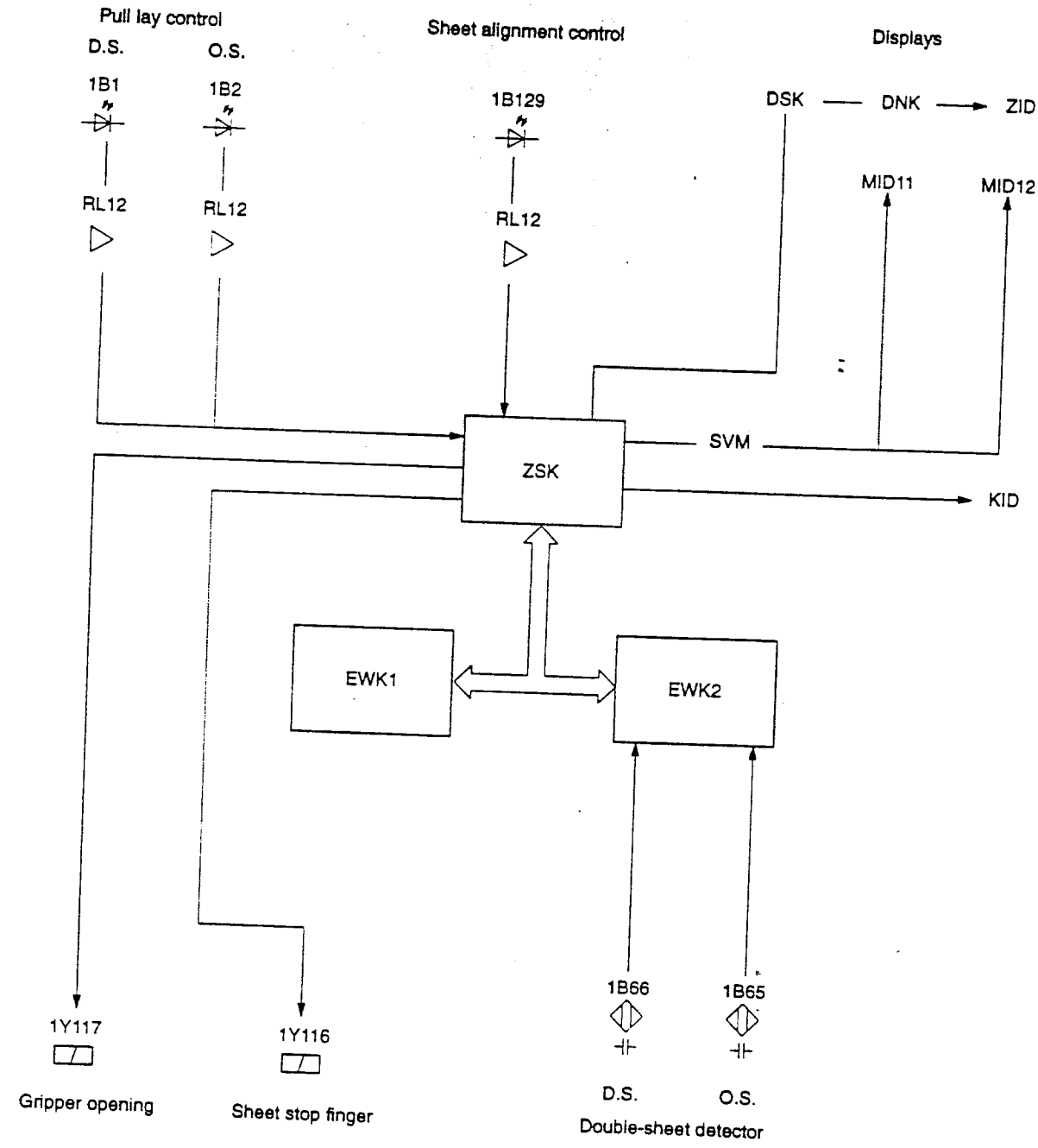
Pull error

A pull error exists if, at the interrogation point ②:

- the ANK sensors (1B131/1B129) detect the print sheet and
- the ZMK sensor does not detect the print sheet.

Sheet alignment

Block diagram



Signal flow for sheet alignment

The sheet alignment system consists of:

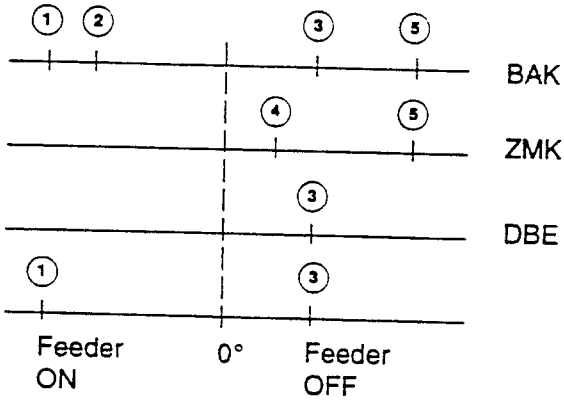
- the sheet alignment control BAK,
- the pull lay control ZMK,
- the double-sheet detector DBE,
- the automatic sheet arrival control BAR (only on SM74).

As a result of mechanically controlled sequences of motions, the sheet is aligned with the sheet alignment system before it enters the first printing unit. At the same time, the electronic control system:

- registers the point of time of sheet arrival,
- monitors sheet infeed,
- detects double-sheets.

From different sensors the electronic control system receives information from the area of the front lays at certain interrogation points.
The control section of the central control board (ZSK) processes the sensor signals. The ZSK shows the result of the evaluation in the control console display ZID and in the press displays MID. Simultaneously, the electronic control system activates various actuators (drives, valves etc.) in the printing press.

Degree values relevant to sheet alignment



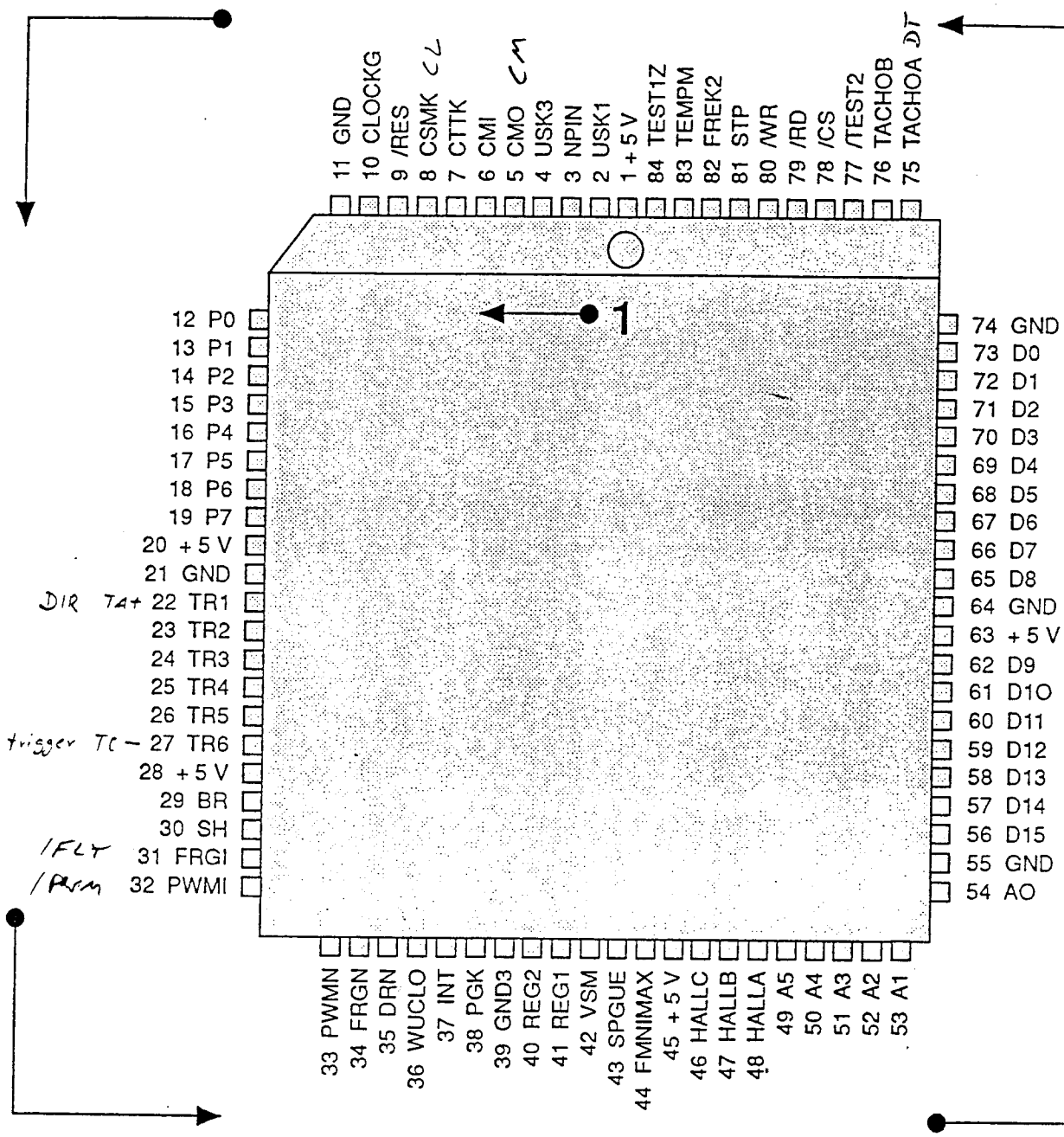
Interrogation points

The illustration opposite shows the different interrogation points in the area of the front lays. The relation between the degree values and the processes in the press is explained in more detail on the next pages. To make the relation clear, the illustration shows the operation points "Feeder ON" and "Feeder OFF".

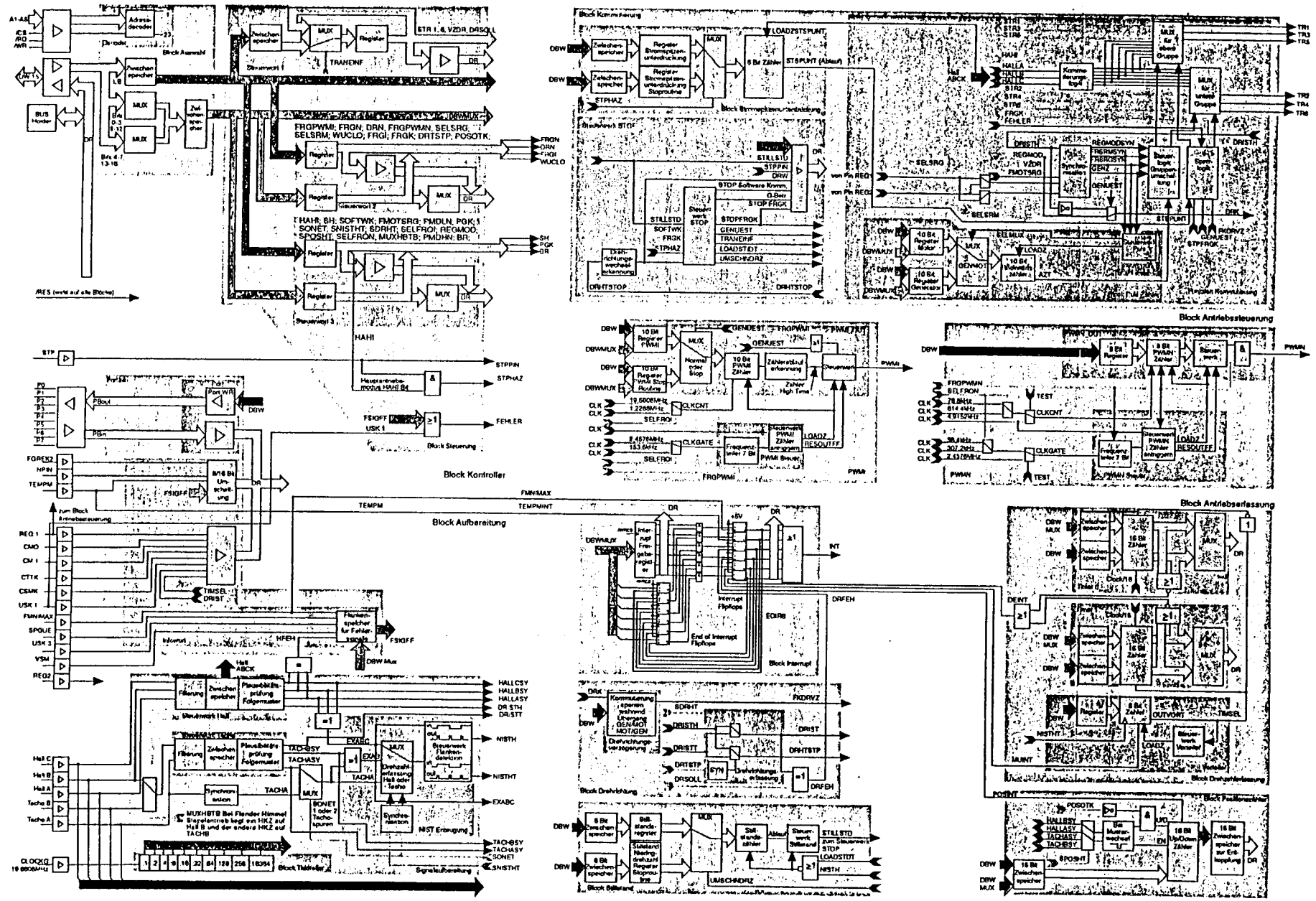
Table with degree values:

	SM52	SM74
①	230°	285°
②		303°
③	20°	30°
④	330°	15°
⑤	42.5°	72°

Pinbelegung BLA IC



BLA IC komplett



VR not protected
xR Short circuit protected

2.2.2 Pinbelegung des PLCC44-Gehäuses

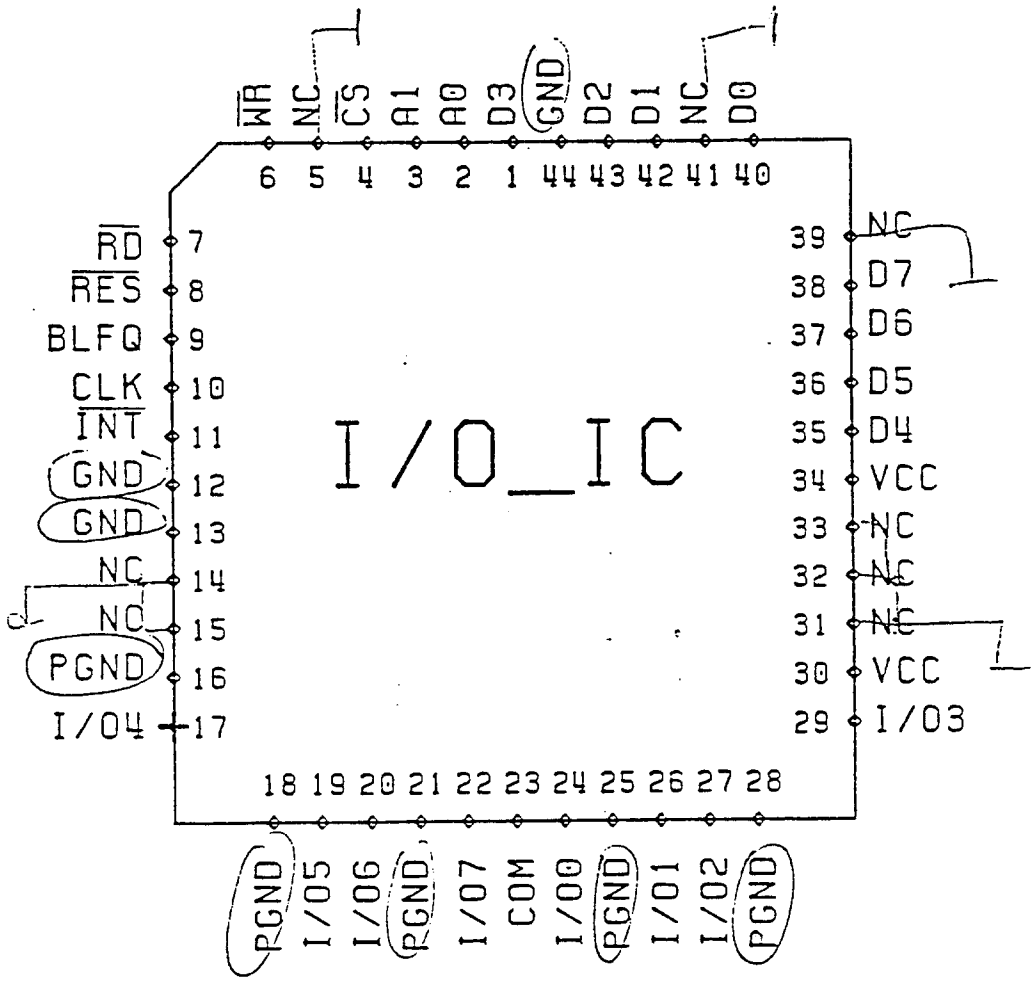
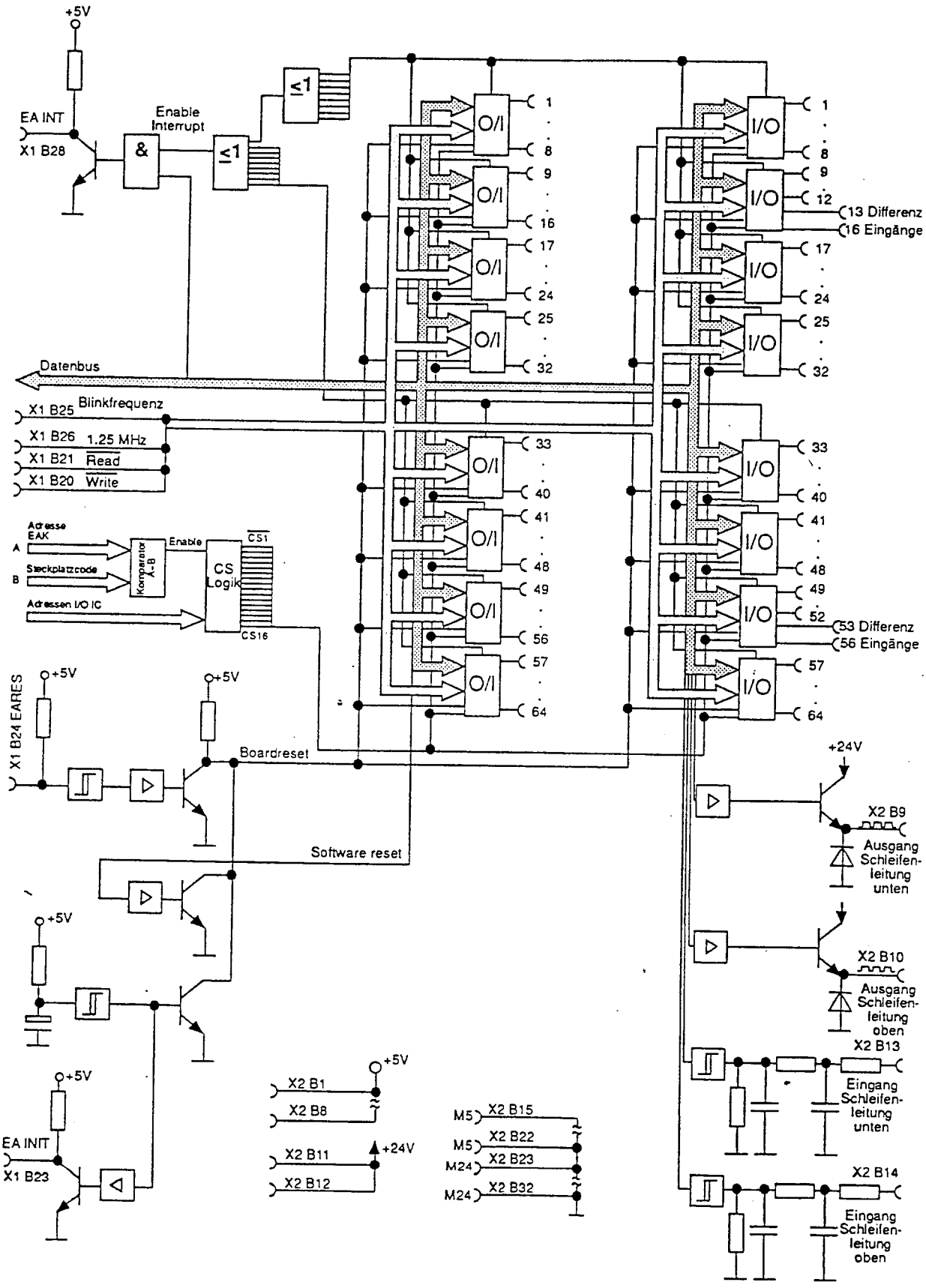
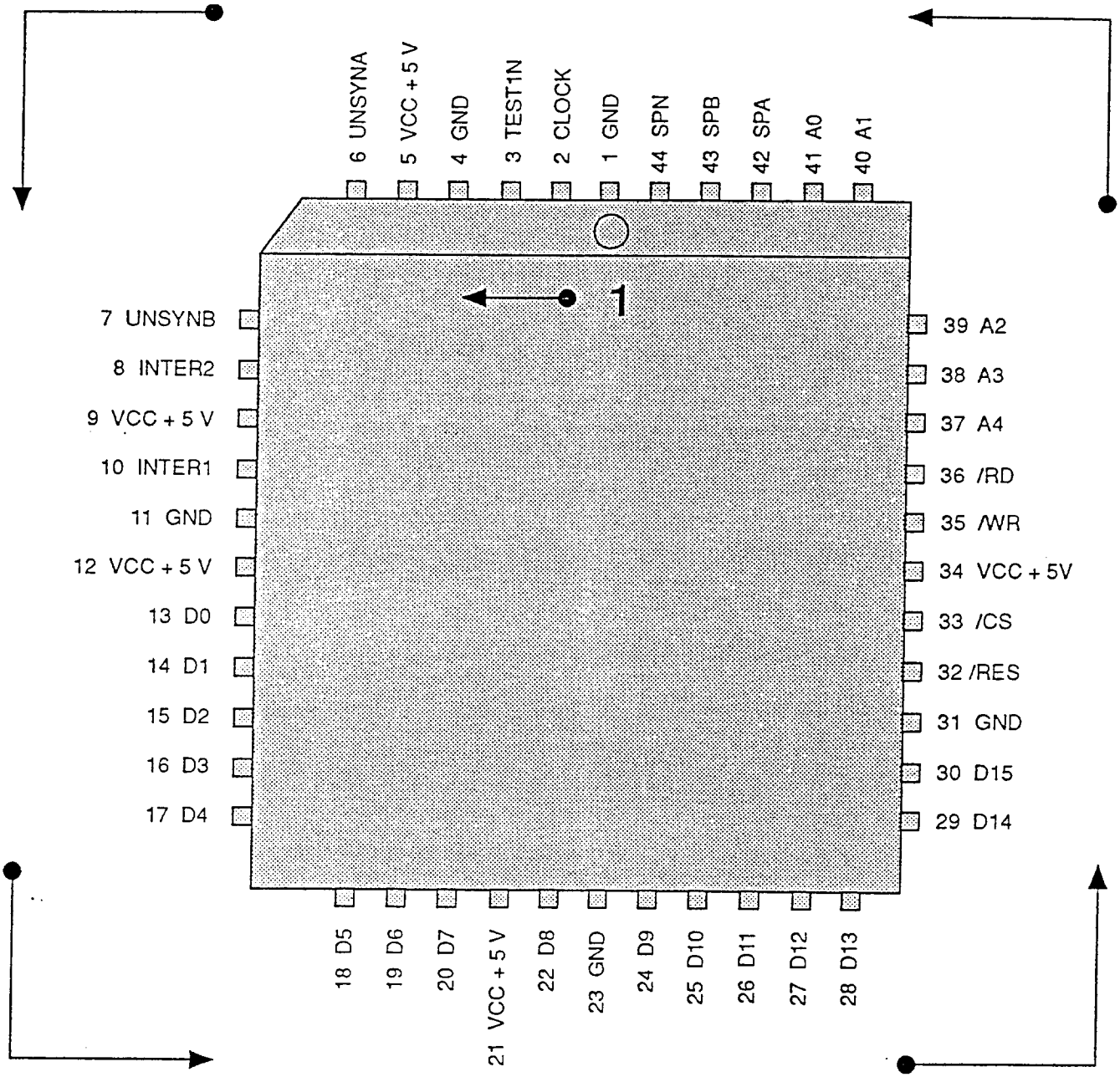


Bild 2.2.2 Pinbelegung I/O-IC im PLCC44-Gehäuse

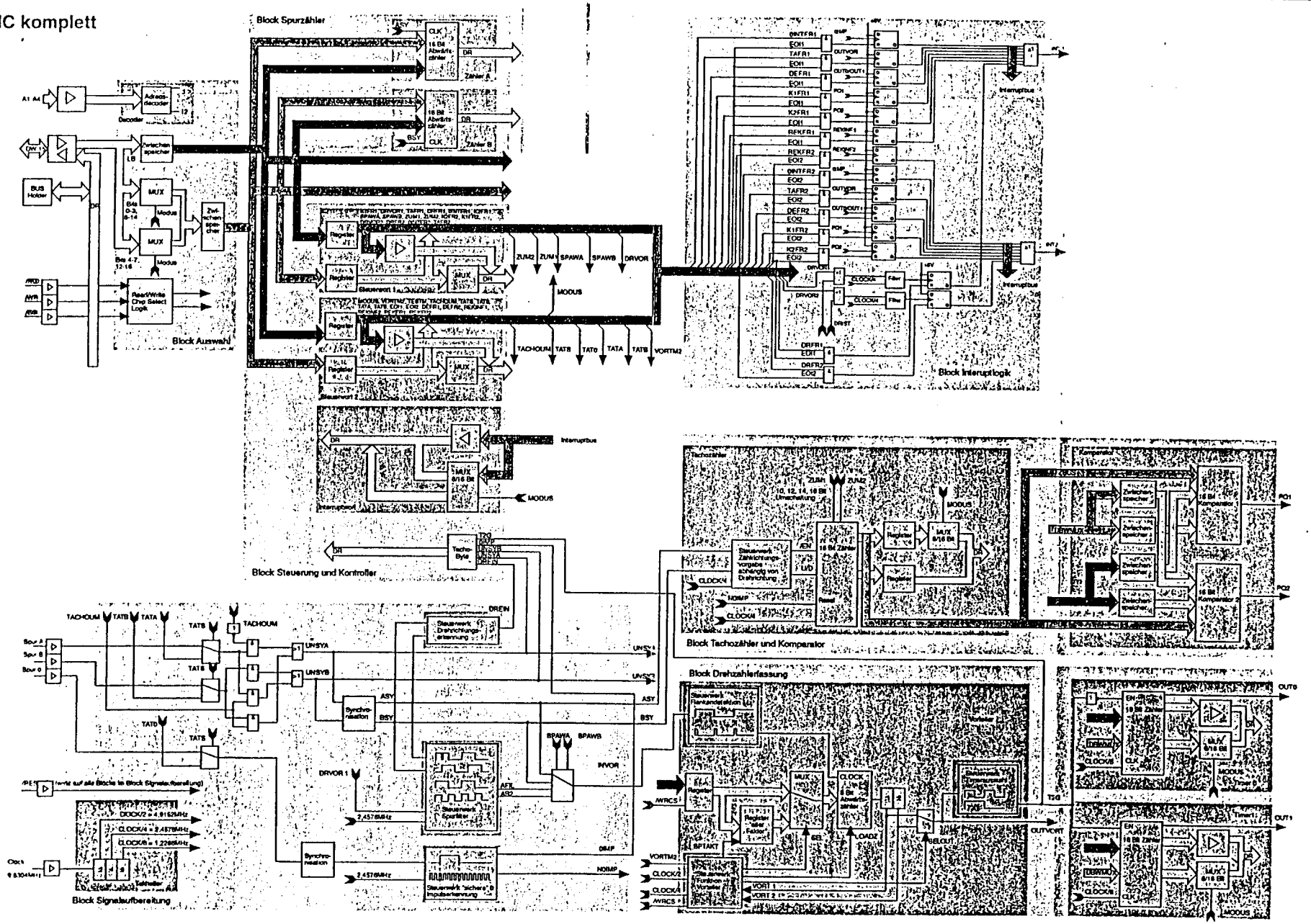
Einsatzgebiet I/O ICs bei EAK2



Tacho IC Pinbelegung



TACHO IC komplett



National Semiconductor

August 1992

LMD18200 3A, 55V H-Bridge

General Description

The LMD18200 is a 3A H-Bridge designed for motion control applications. The device is built using a multi-technology process which combines bipolar and CMOS control circuitry with DMOS power devices on the same monolithic structure. Ideal for driving DC and stepper motors; the LMD18200 accommodates peak output currents up to 6A. An innovative circuit which facilitates low-loss sensing of the output current has been implemented.

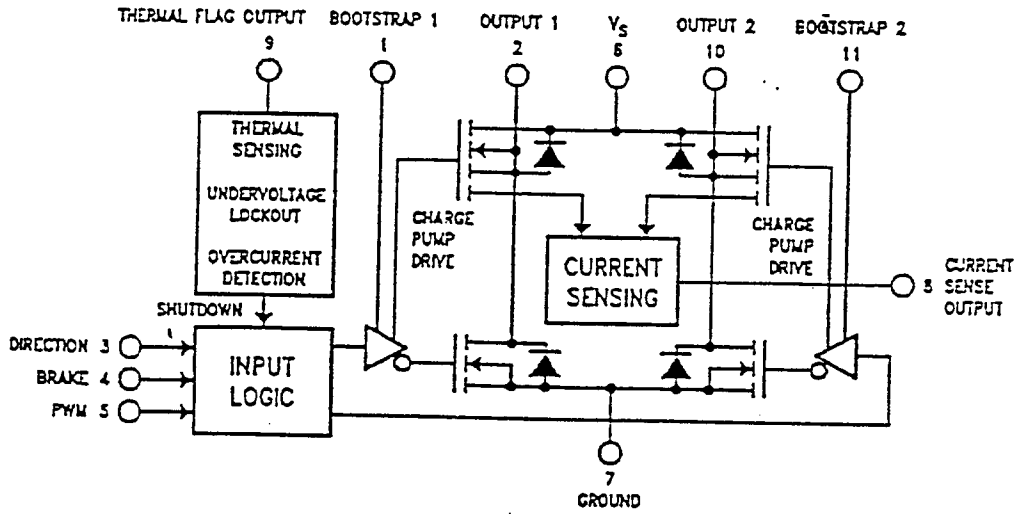
Features

- Delivers up to 3A continuous output
- Operates at supply voltages up to 55V
- Low $R_{DS(ON)}$ typically 0.3Ω per switch
- TTL and CMOS compatible inputs
- No "shoot-through" current
- Thermal warning flag output at 145°C
- Thermal shutdown (outputs off) at 170°C
- Internal clamp diodes
- Shorted load protection
- Internal charge pump with external bootstrap capability

Applications

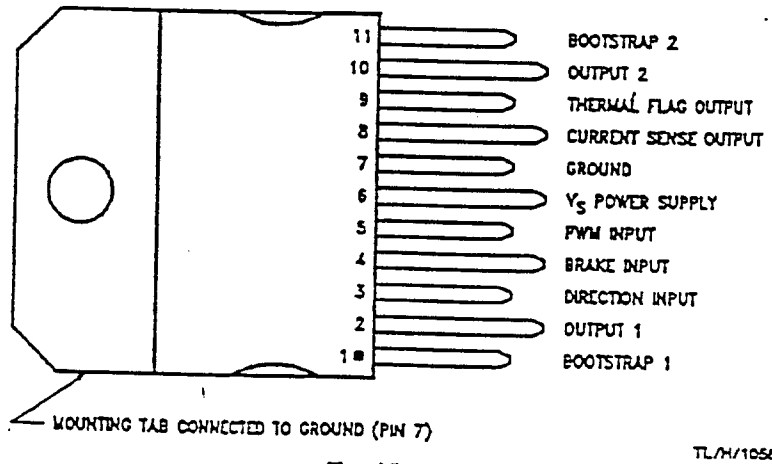
- DC and stepper motor drives
- Position and velocity servomechanisms
- Factory automation robots
- Numerically controlled machinery
- Computer printers and plotters

Functional Diagram



TL/H/10568–1

Connection Diagram and Ordering Information



Top View

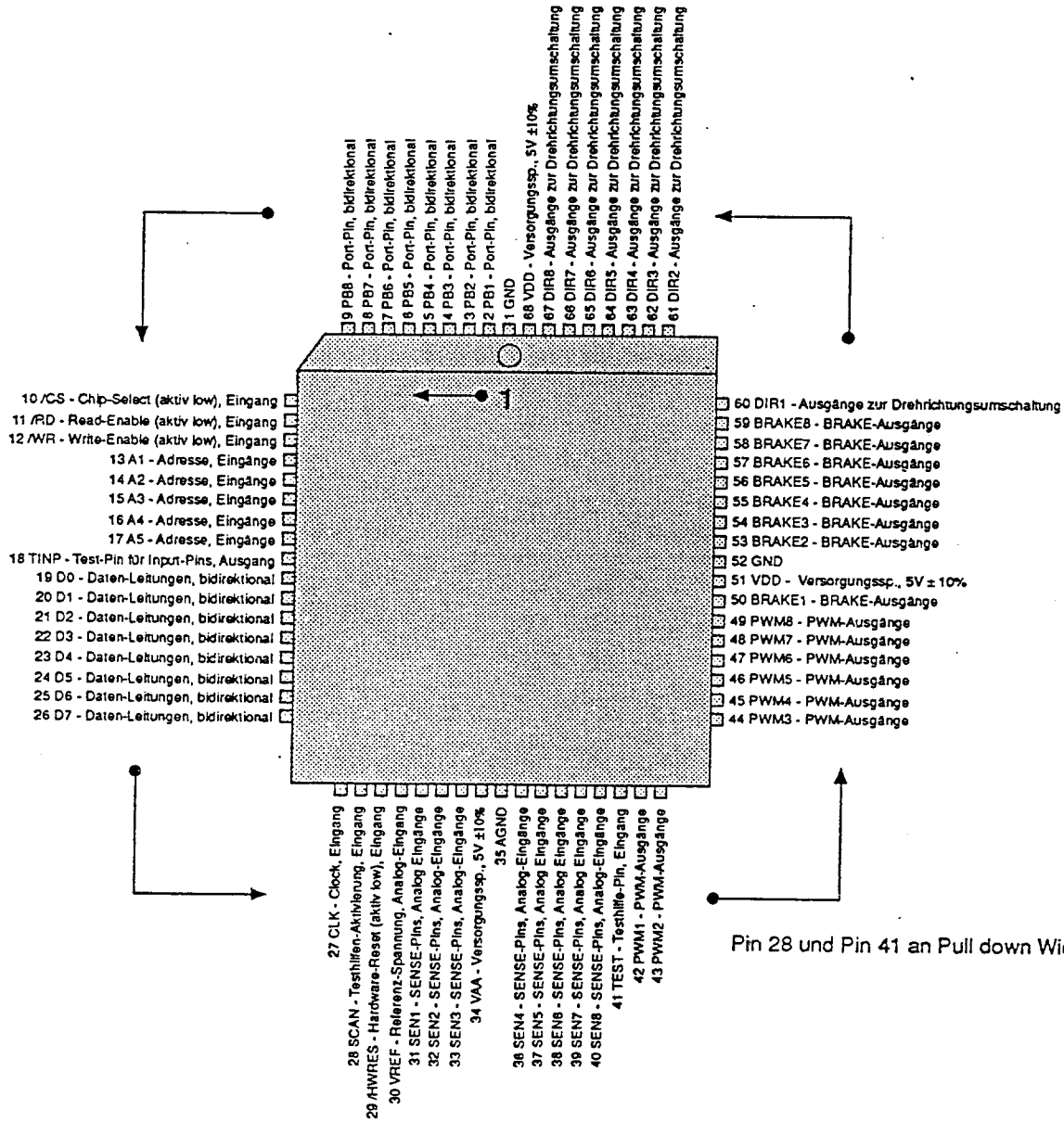
TL/H/10568–2

Order Number LMD18200T
See NS Package TA11B

NOTE:- PIN 2 → 0.9V
→ 0.9V ON RUN OF PRESS
→ 24V ON RUN OF MOTOR
→ + BUTTON 24V

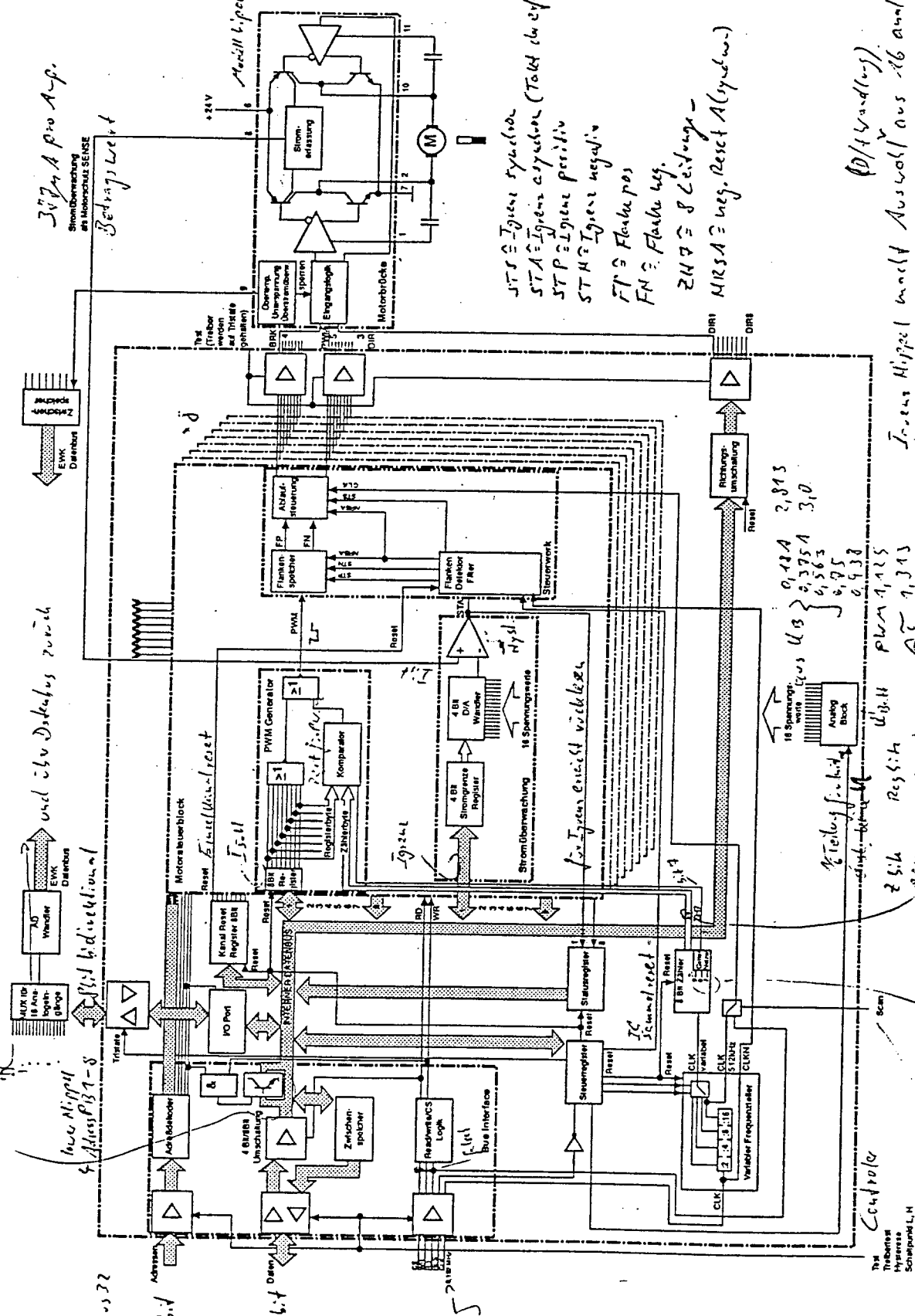
PIN 10 → 0.9V
→ 0.9V ON RUN
→ 24V ON RUN OF MO
→ + BUTTON 24V

Pinbelegung SSK IC

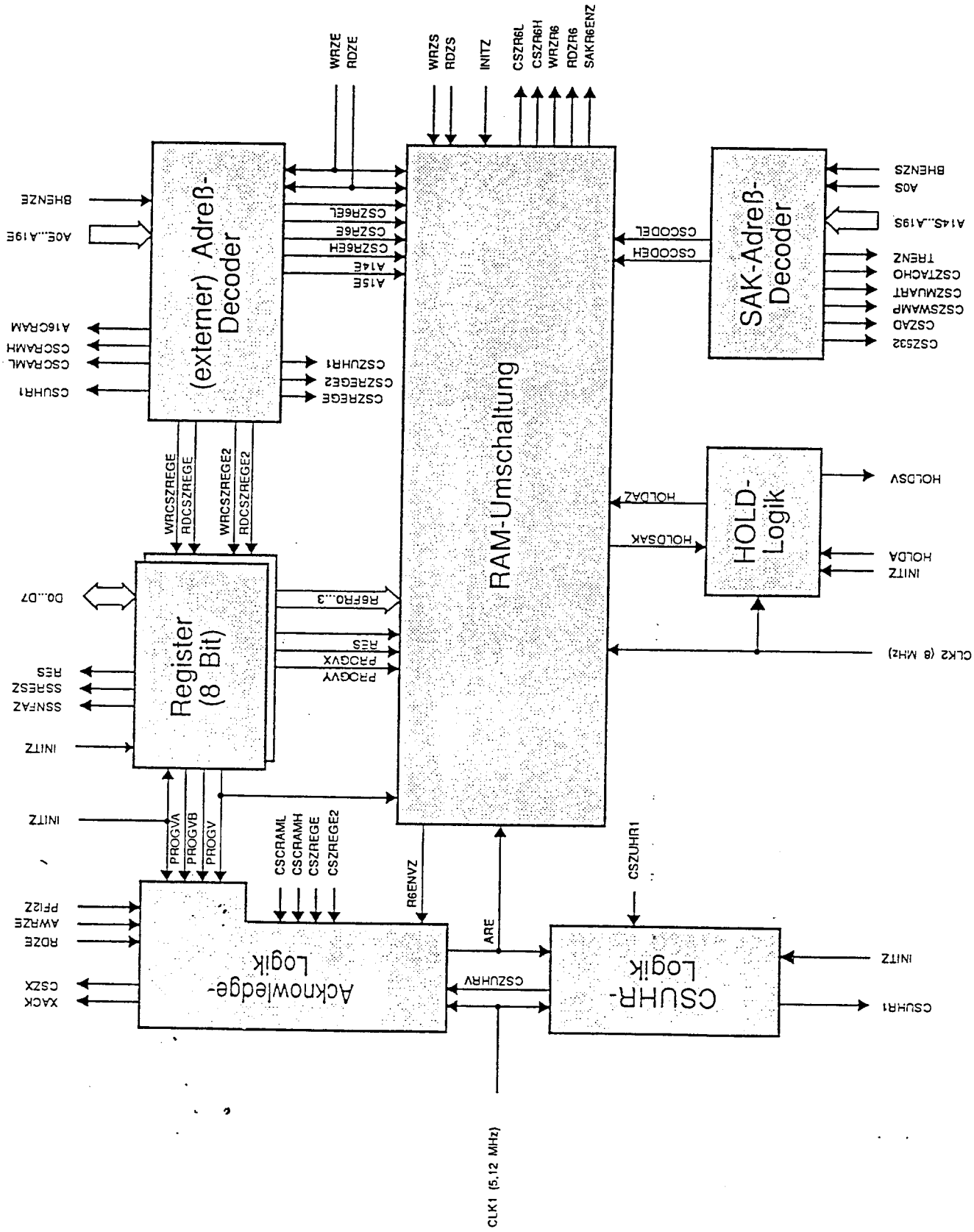


Pin 28 und Pin 41 an Pull down Widerstand

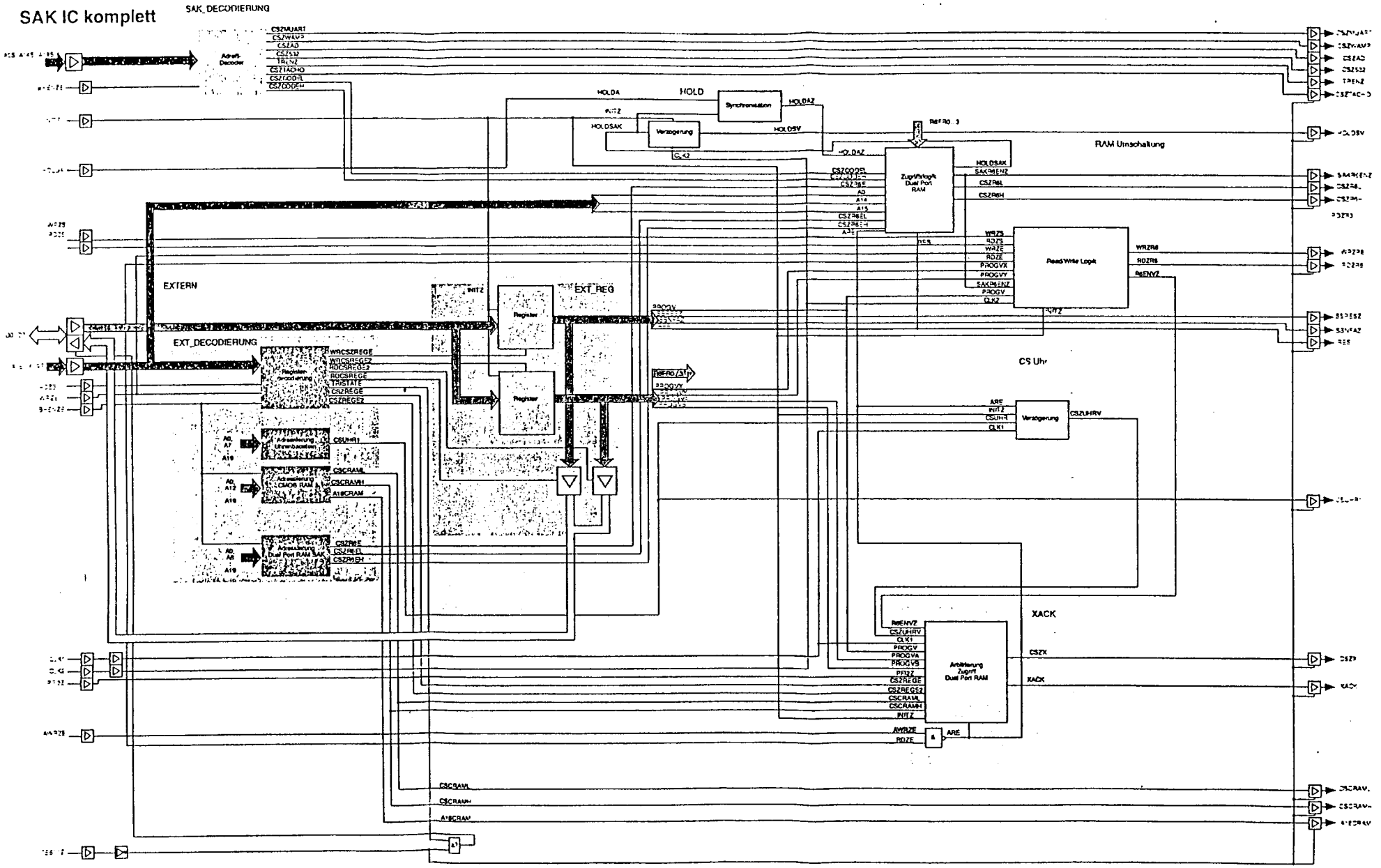
SSK IC - komplett (Bus Interface, Block Kontroller, Motorsteuerblock und Motorbrücke)



Übersichtschaltbild SAK IC

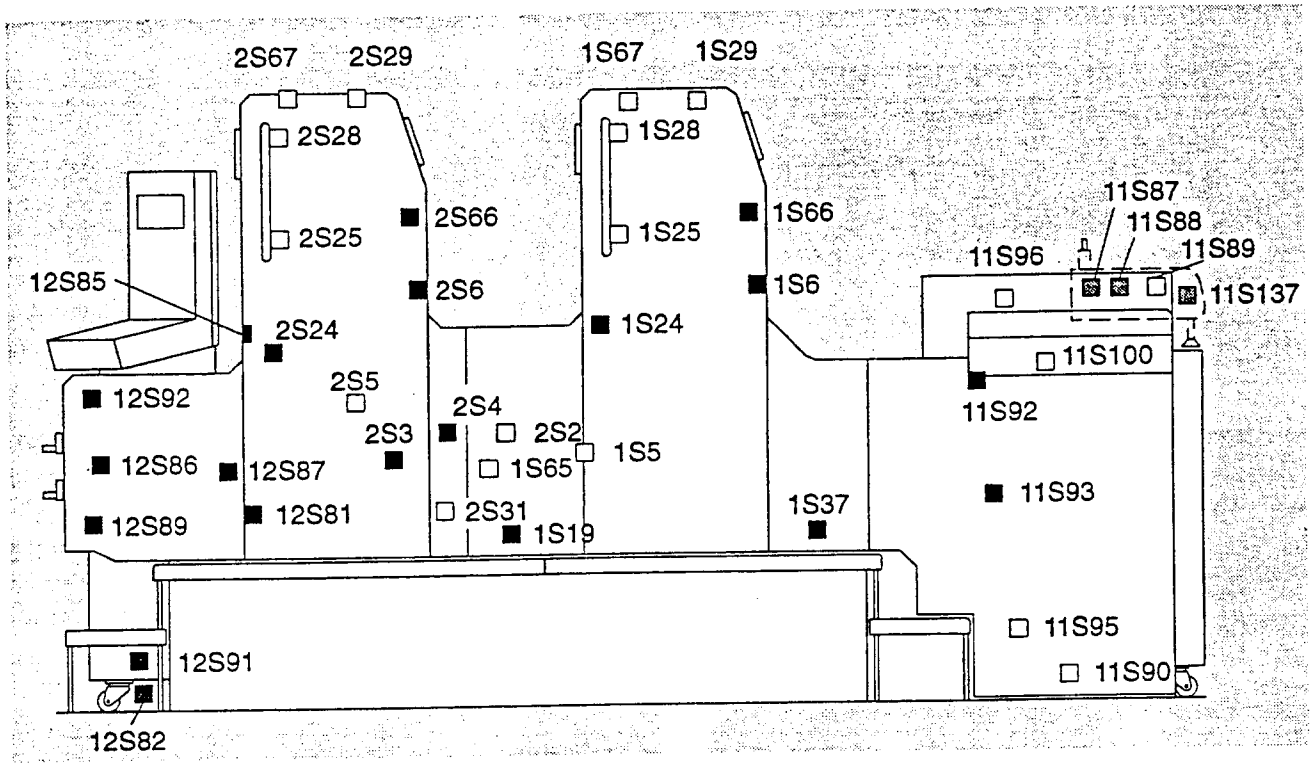


SAK IC komplett



Location diagrams

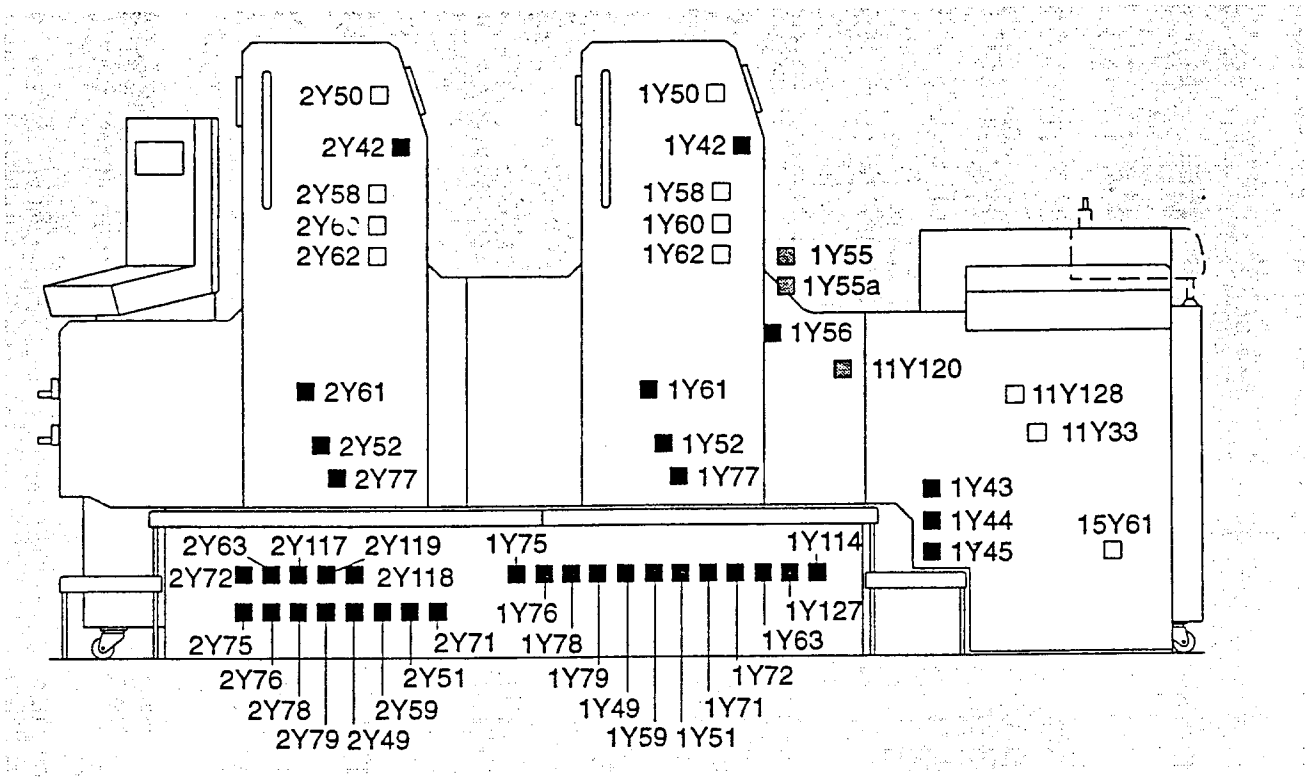
Position switches



Side view SM74-2-P

- ■ Equipment on the operator side O.S.
- □ Equipment on the drive side D.S.
- ▩ Equipment which can be allocated neither to the operator side nor to the drive side

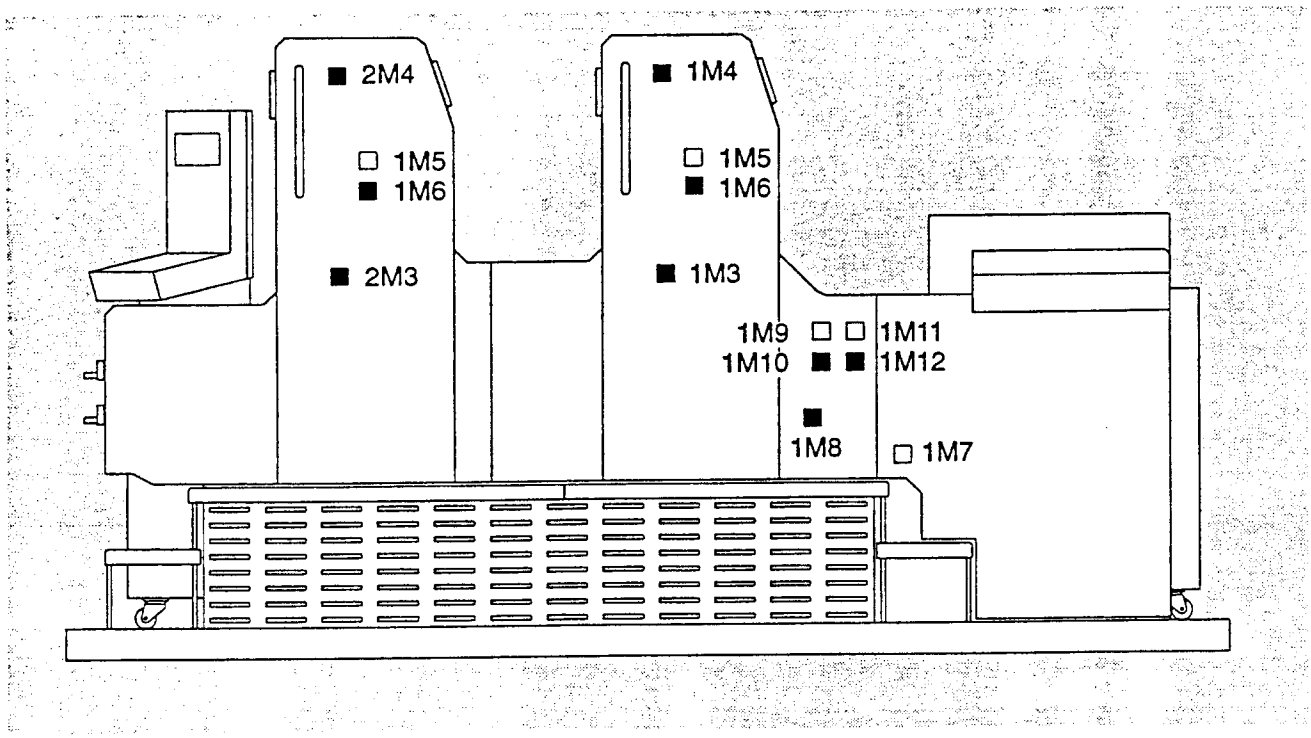
Pneumatic valves, solenoid valves



Side view SM74-2

- ■ Equipment on the operator side O.S.
- □ Equipment on the drive side D.S.
- ▨ Equipment which can be allocated neither to the operator side nor to the drive side.

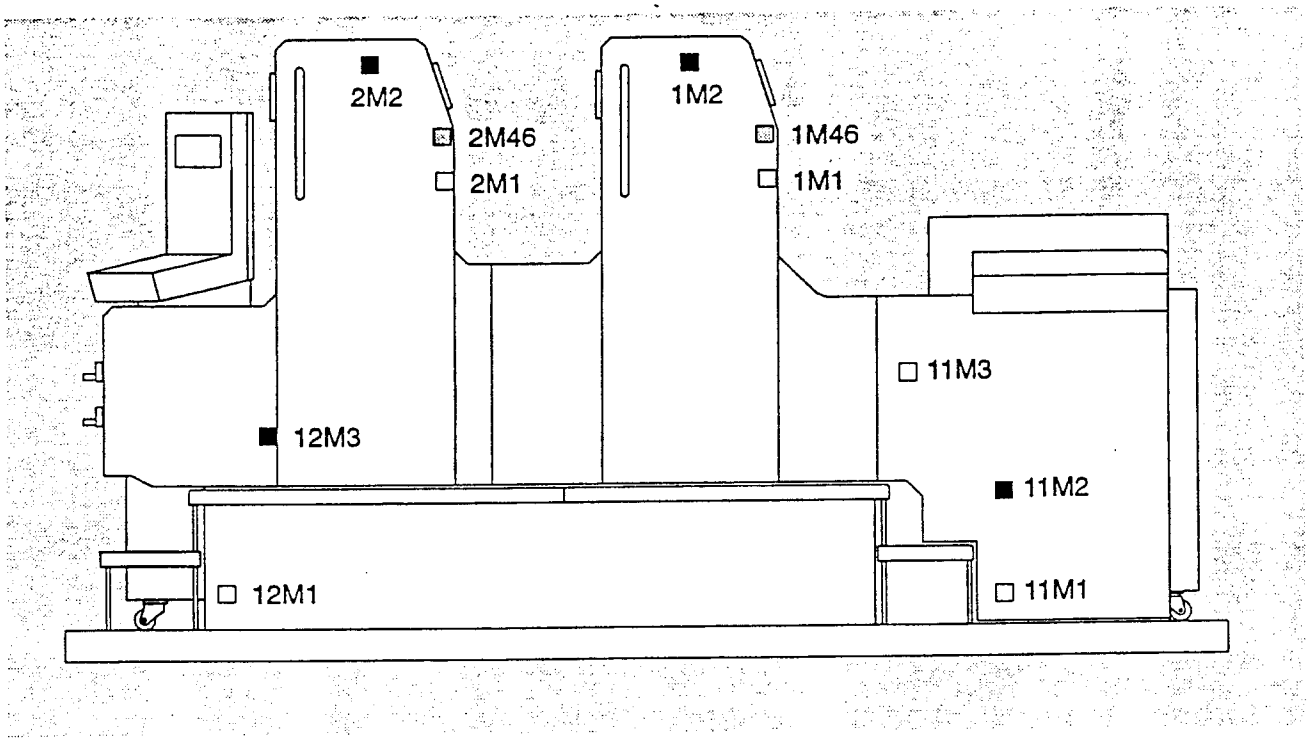
Servo-drives



Side view SM74-2

■ Servo-drives on the operator side O.S.
□ Servo-drives on the drive side D.S.

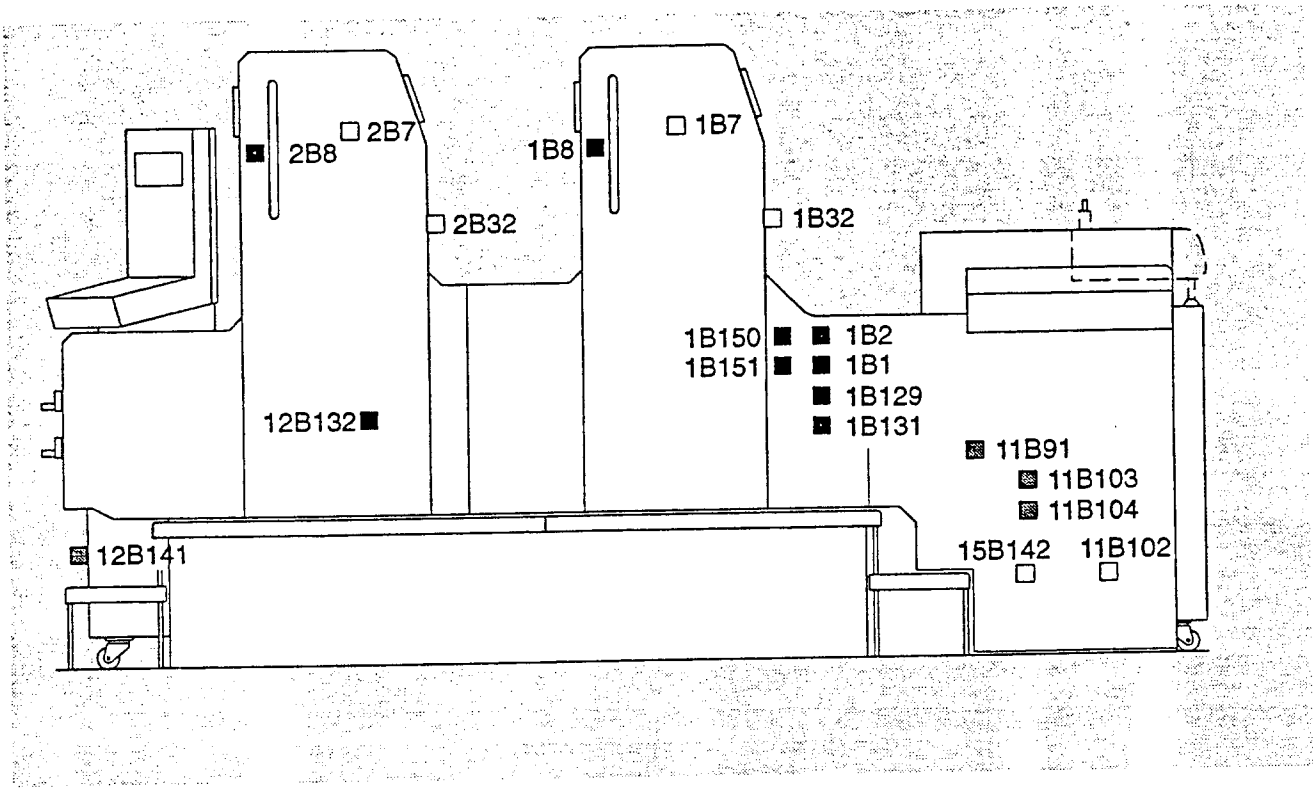
Auxiliary drives



Side view SM74-2

- ■ Auxiliary drives on the operator side O.S.
- □ Auxiliary drives on the drive side D.S.
- ▩ Equipment which can be allocated neither to the operator side nor to the drive side

Sensors

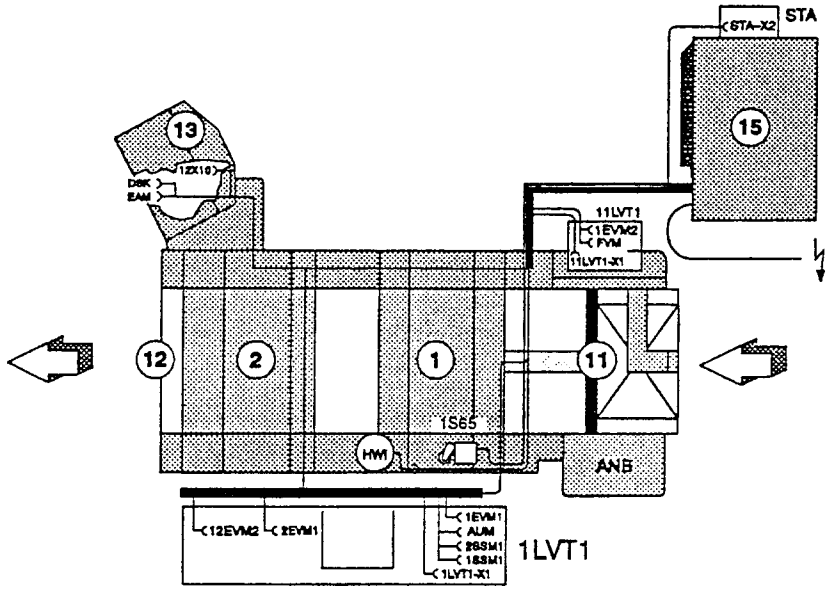


Side view SM74-2

- ■ Equipment on the operator side O.S.
- □ Equipment on the drive side D.S.
- ▩ Equipment which can be allocated neither to the operator side nor to the drive side

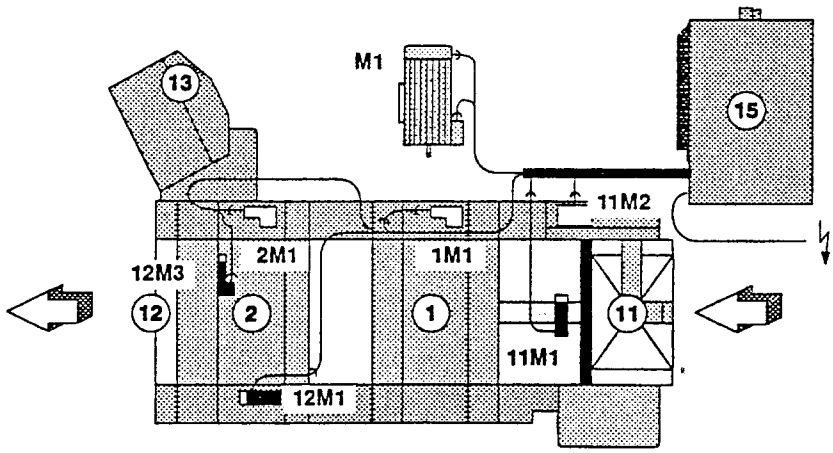
Cable routing

Control cables



Cable routing on GTO Z-S

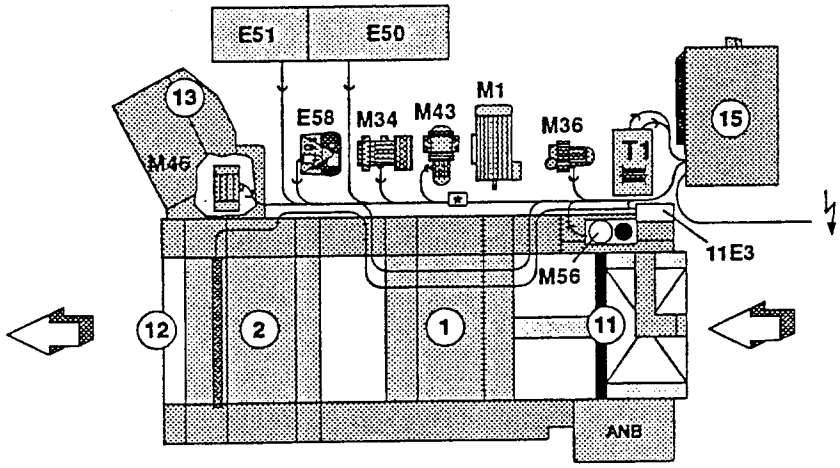
To the main motor and auxiliary drives



Cable routing of the auxiliary drives and the main motor

ANB –	Feeder operating panel	1M1 –	Water pan roller motor PU1
LVT –	Distribution box	2M1 –	Water pan roller motor PU2
HWI –	Encoder	11M1 –	Pile motor at feeder
STA –	Interface adapter	11M2 –	Suction unit motor at feeder
M1 –	Main motor	12M1 –	Pile motor at delivery
1S65 –	Position switch "Press cycle"	12M3 –	Sheet slowdown motor at delivery

To the auxiliary devices



Cable routing of the auxiliary devices

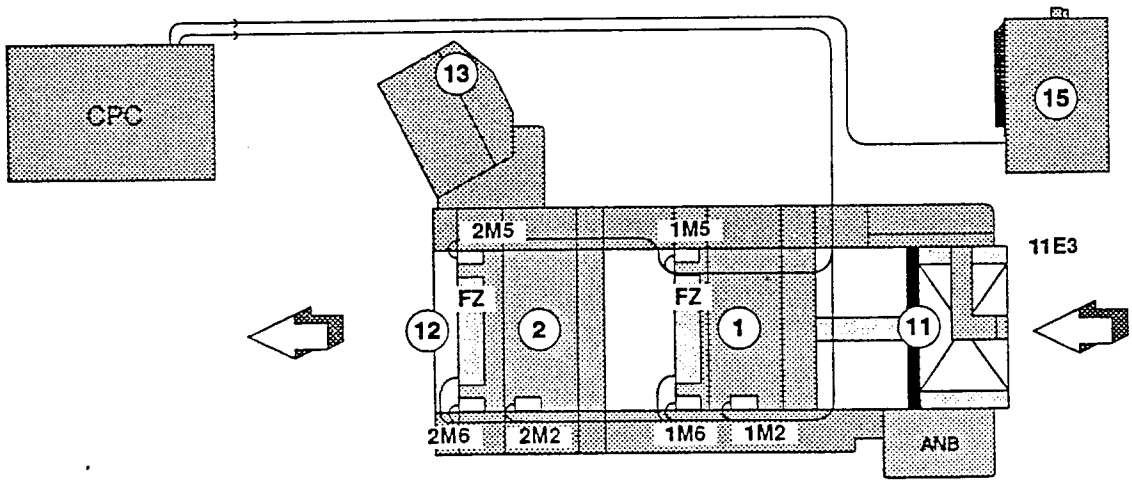
*Note: * Fasten the cables to the crossbar (above the main motor) using cable clips. Install the devices as shown in the illustration !*

M34 – Compressor feeder, delivery
M36 – Air blast unit – damping system
M43 – Vacuum pump – sheet reversing device
M46 – Blower – powder spray device
M56 – Motor of oil pump
E58 – Compressor for pneumatic system
E50 – Cooling and circulating device
T1 – Matching transformer

Extra accessories:

E51 – Damping solution mixing unit (Automix)
11E3 – Static electricity eliminator (neutralizer bar in delivery)

CPC



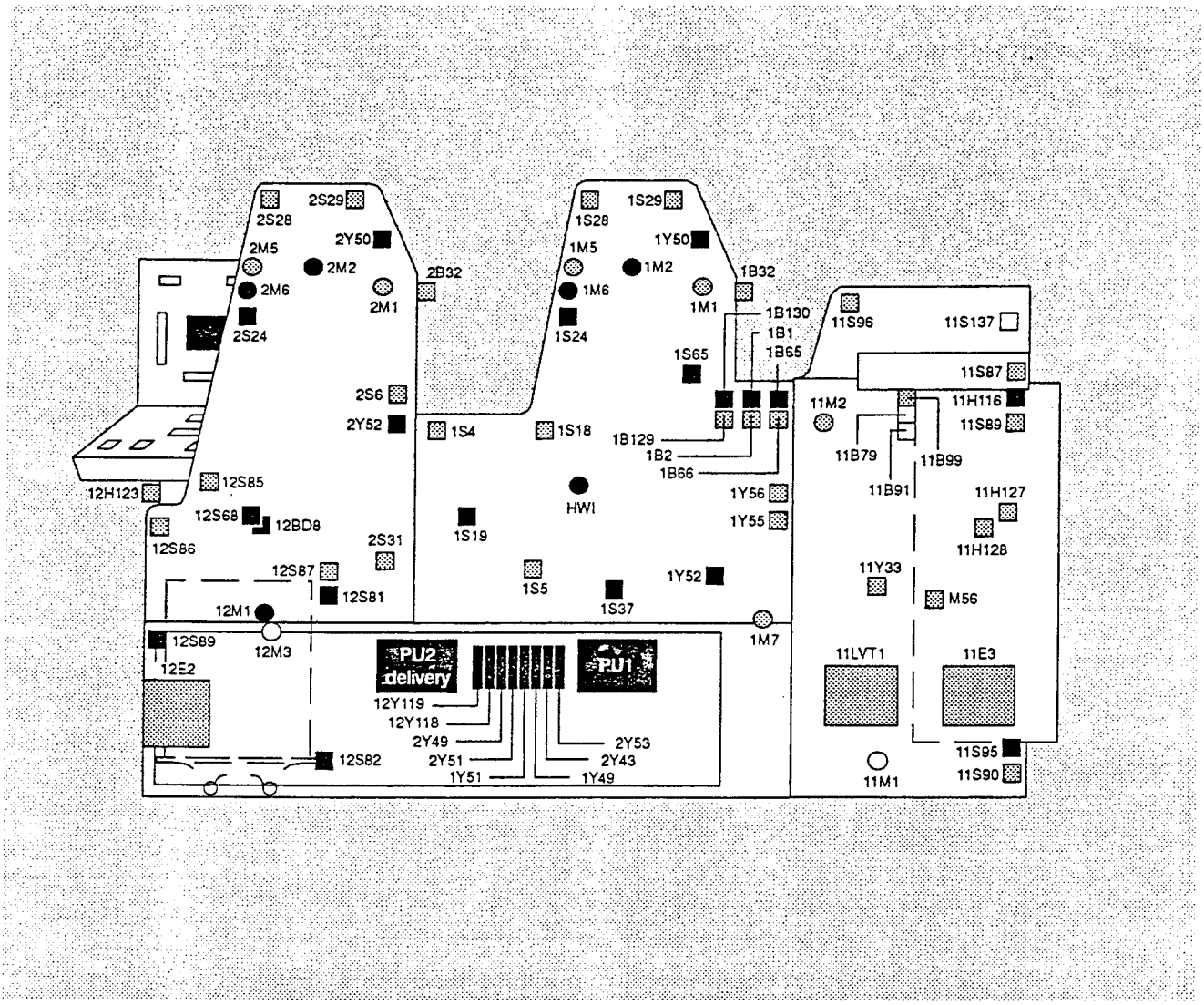
Cable routing of servo drives

1M1/2M1 – Ink fountain roller PU1 and PU2
1M5/2M5 – Circumferential register PU1 and PU2
1M6/2M5 – Lateral register PU1 and PU2
FZ – Ink zone motors

Note:
If there is no CPC console, the servo drives are connected directly in the central control cabinet ZSG.

Location diagrams

Electrical equipment



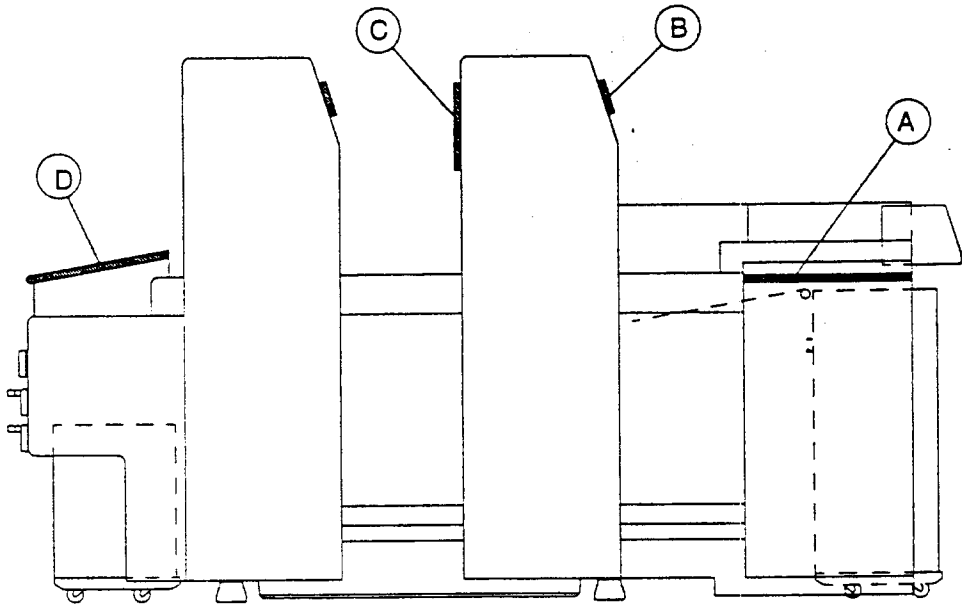
Operator's side O.S.

- ■ Electrical equipment on the operator's side O.S.
- ▨ Electrical equipment on the drive side D.S.
- □ Electrical equipment which can be allocated neither to the D.S. nor to the O.S.

Location diagrams

Operating panels

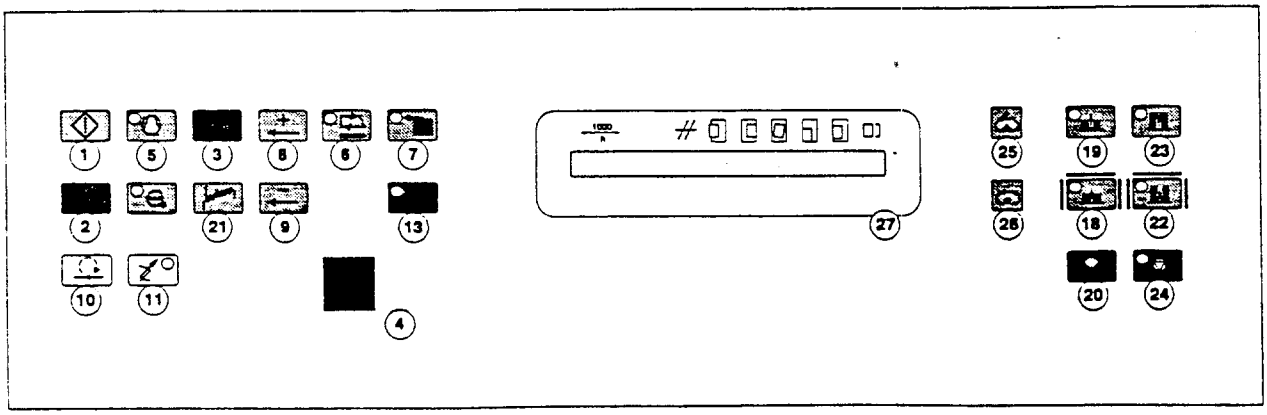
Overview



Printing press SM52-2

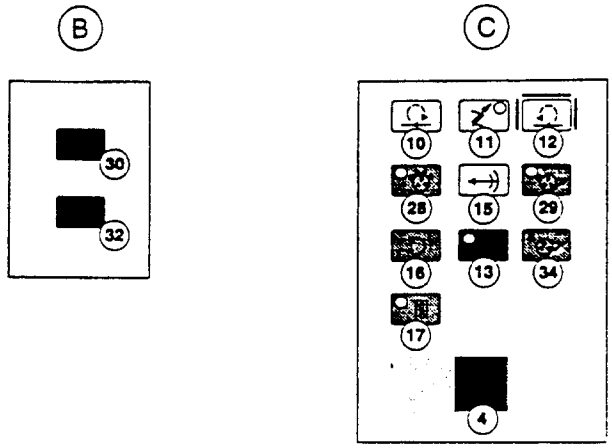
Feeder

A



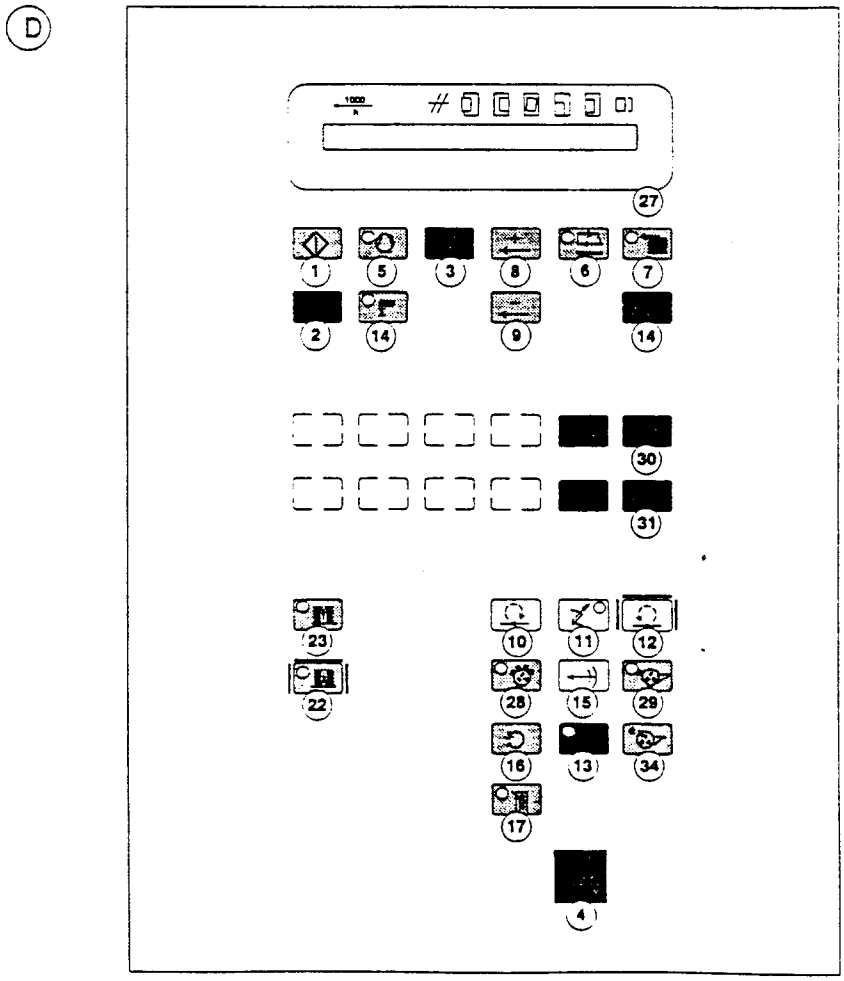
Operating panel feeder

Printing unit



Operating panel printing unit O.S.

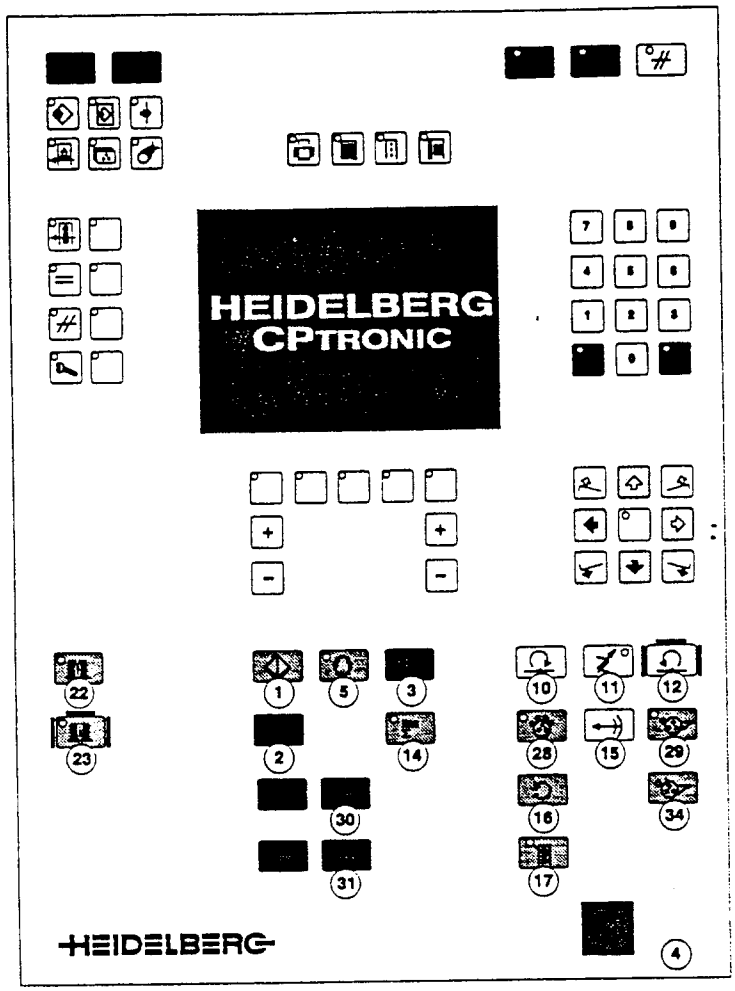
Delivery



Operating panel delivery on presses with CPC and central control console

Delivery

(D)



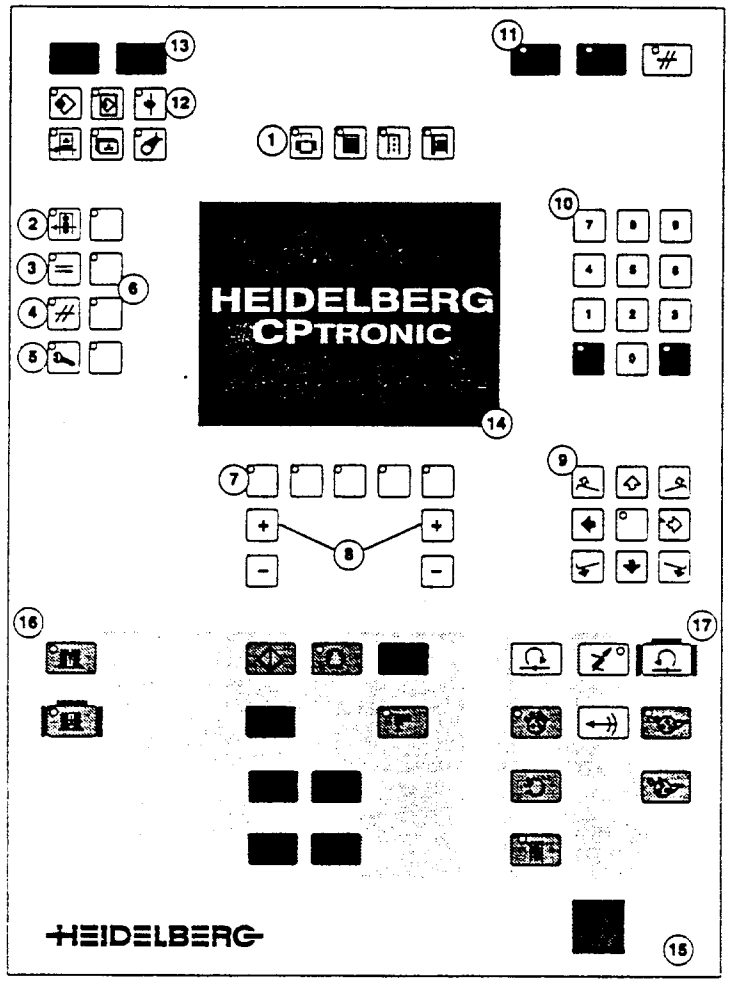
Compact control console on presses without CPC

Operator's controls

		Description	Feeder	Printing unit	Delivery	
①		Pushbutton "Run"	11S13		12S13	
②		Pushbutton "Stop"	11S32		12S32	
③		Pushbutton "Production run"	11S20		2S20	
④		"Emergency stop" button	11S12	1...nS62	12S12	
⑤		Illuminated pushbutton "Compressor on/off"	11S14 11H88		12S14 12H88	
⑥		Illuminated pushbutton "Feeder on/off"	11S16 11H90		12S16 12H90	
⑦		Illuminated pushbutton "Paper run on/off"	11S15 11H89		12S15 12H89	
⑧		Pushbutton "Fast"	11S21		2S21	
⑨		Pushbutton "Slow"	11S22		2S22	
⑩		Pushbutton "Forward"	11S18	1S63	2S18	
⑪		Illuminated pushbutton "Safe"	11S19 11H94	1S64 1H73	2S19 2H94	
⑫		Pushbutton "Backward"		1S65	2S23	
⑬		Signal lamp "Malfunction feeder" "Malfunction delivery" "Malfunction printing/coating unit"	11H92	1H74	2H92	
⑭		Illuminated pushbutton "Job counter on/off"			12S17 12H85	
⑮		Pushbutton "Crawl speed"		1S67	2S33	
⑯		Pushbutton "Position"		1S66	2S24	
⑰		Illuminated pushbutton "Plate mounting"		1S70 1H77	2H34 2H93	
⑱		Illuminated pushbutton "Auxiliary pile down"	11S31 11H31			
⑲		Illuminated pushbutton "Auxiliary pile up"	11S30 11H30			
⑳		Illuminated pushbutton "Auxiliary pile on/off"	11S29 11H93			

		Description	Feeder	Printing unit	Delivery	
(21)		Pushbutton "Raising the sheet stop fingers"	11S17			
(22)		Illuminated pushbutton "Main pile down"	11S27 11H27		12S27 12H91	
(23)		Illuminated pushbutton "Main pile up"	11S26 11H26		12S26 12H26	
(24)		Pushbutton "Pile stop"	11S28			
(25)		Pushbutton "Suction air for suction tape +"	11S23			
(26)		Pushbutton "Suction air for suction tape –"	11S24			
(27)		Press display MID				
(28)		Illuminated pushbutton "Inking form rollers on/off"		1S68 1H75	2S36 2H86	
(29)		Illuminated pushbutton "Ink ductor on/off"		1S69 1H76	2S11 2H87	
(30)		Pushbutton "+ dampening" "Washing the dampening/ varnishing rollers"		1...nS50	12S28 12S30	
(31)		Illuminated pushbutton "– dampening"			12S29 12S31	
(32)		Pushbutton "Adjusting the dampening rollers"		1...nS49		
(34)		Illuminated pushbutton "Turning the ink fountain roller"		1S71	2S35	

Control panel of compact control console KSP



Compact control console KSP on presses without CPC

① Selector buttons "Unit"
Entire press,
delivery,
printing unit,
feeder.

② Production run display

③ Actual value display

④ Fault display

⑤ Service display

⑥ Selector buttons "Group"

⑦ Function buttons

⑧ Adjustment buttons

⑨ Register adjustment buttons

⑩ Numeric keypad

⑪ Signal lamps (from left to right)
"Malfunction press" (red),
"Malfunction control console" (blue),
"Malfunction production run" (yellow).

⑫ Command buttons

⑬ Command control buttons

⑭ Compact information display KID

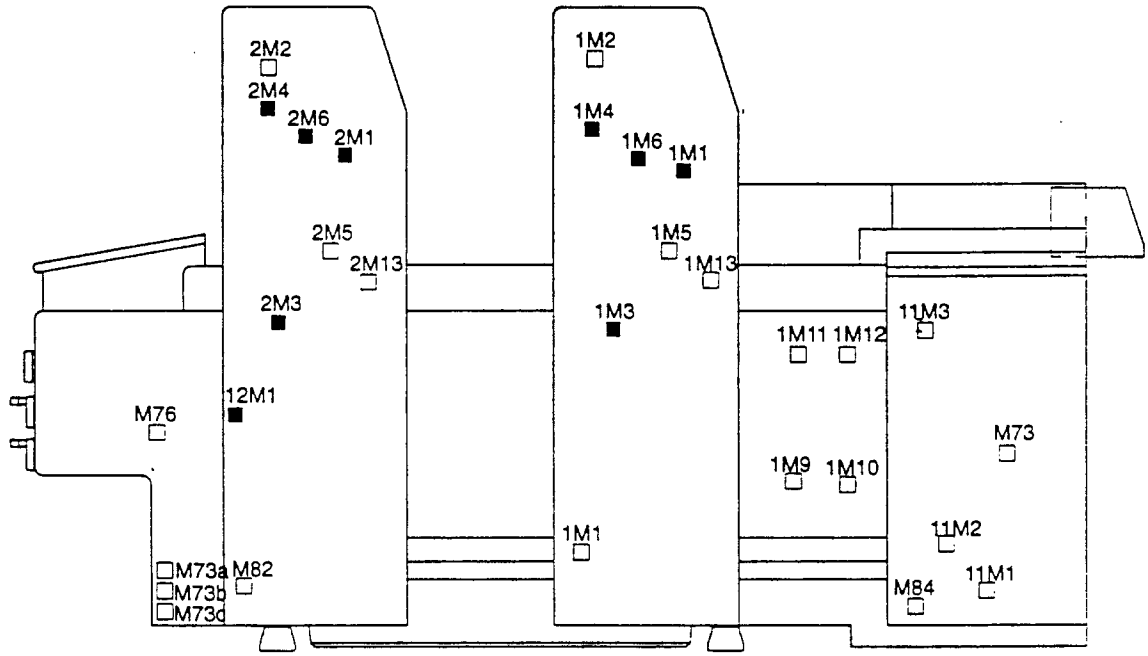
⑮ "Emergency stop" button

⑯ Operating panel delivery

⑰ Operating panel printing unit

Motors

Entire press



Side view SM 52-2

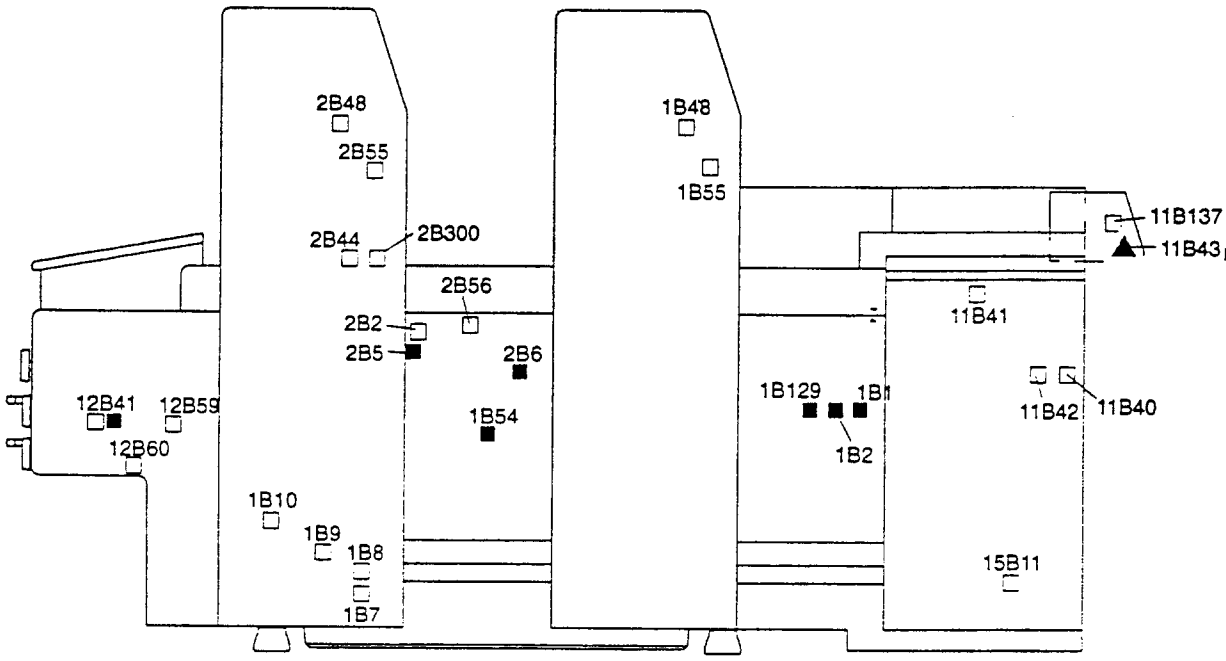
■ Equipment on the operator side O.S.

□ Equipment on the drive side D.S.

▲ Equipment which can be allocated neither to the operator nor to the drive side.

Sensors

Entire press

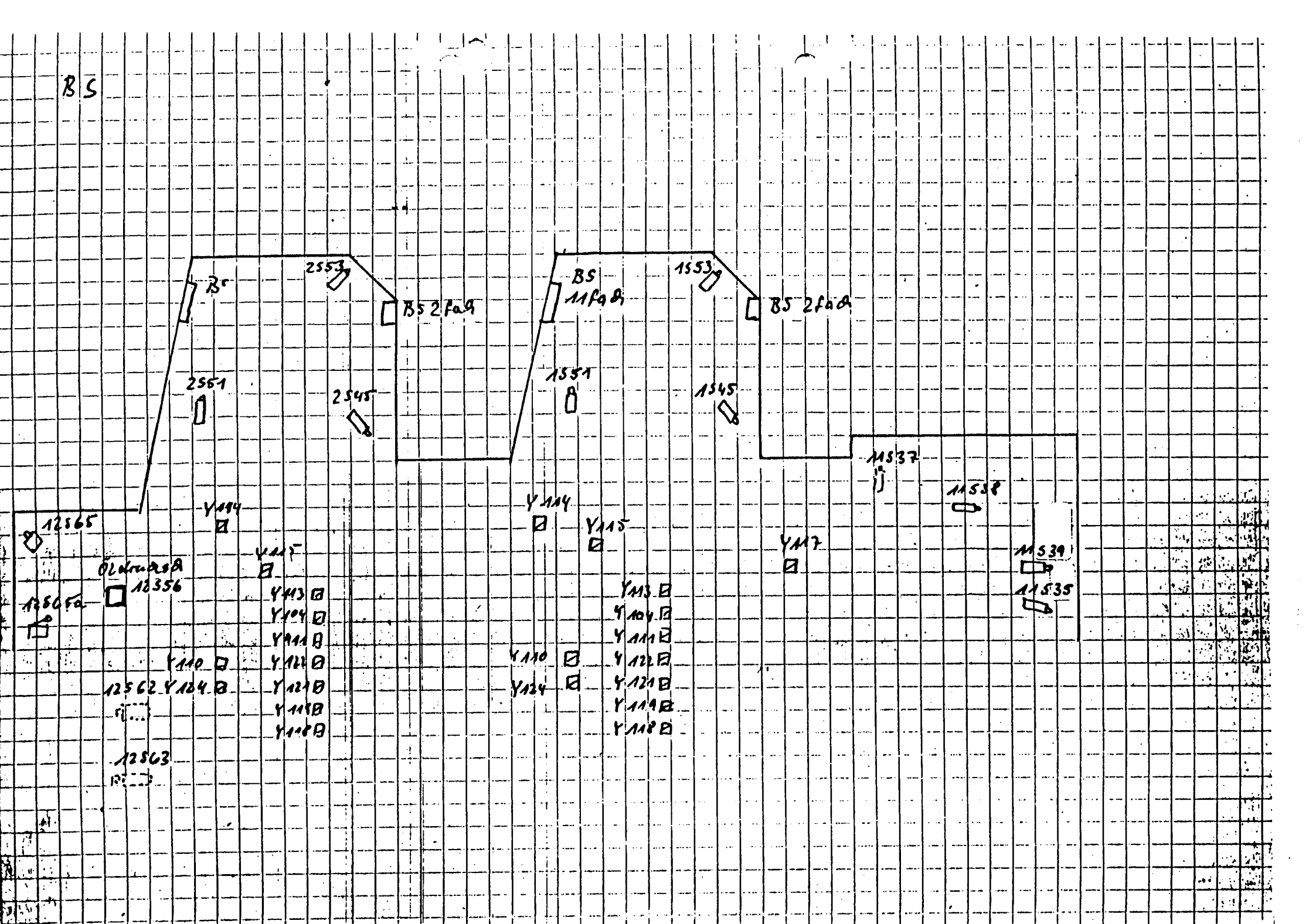


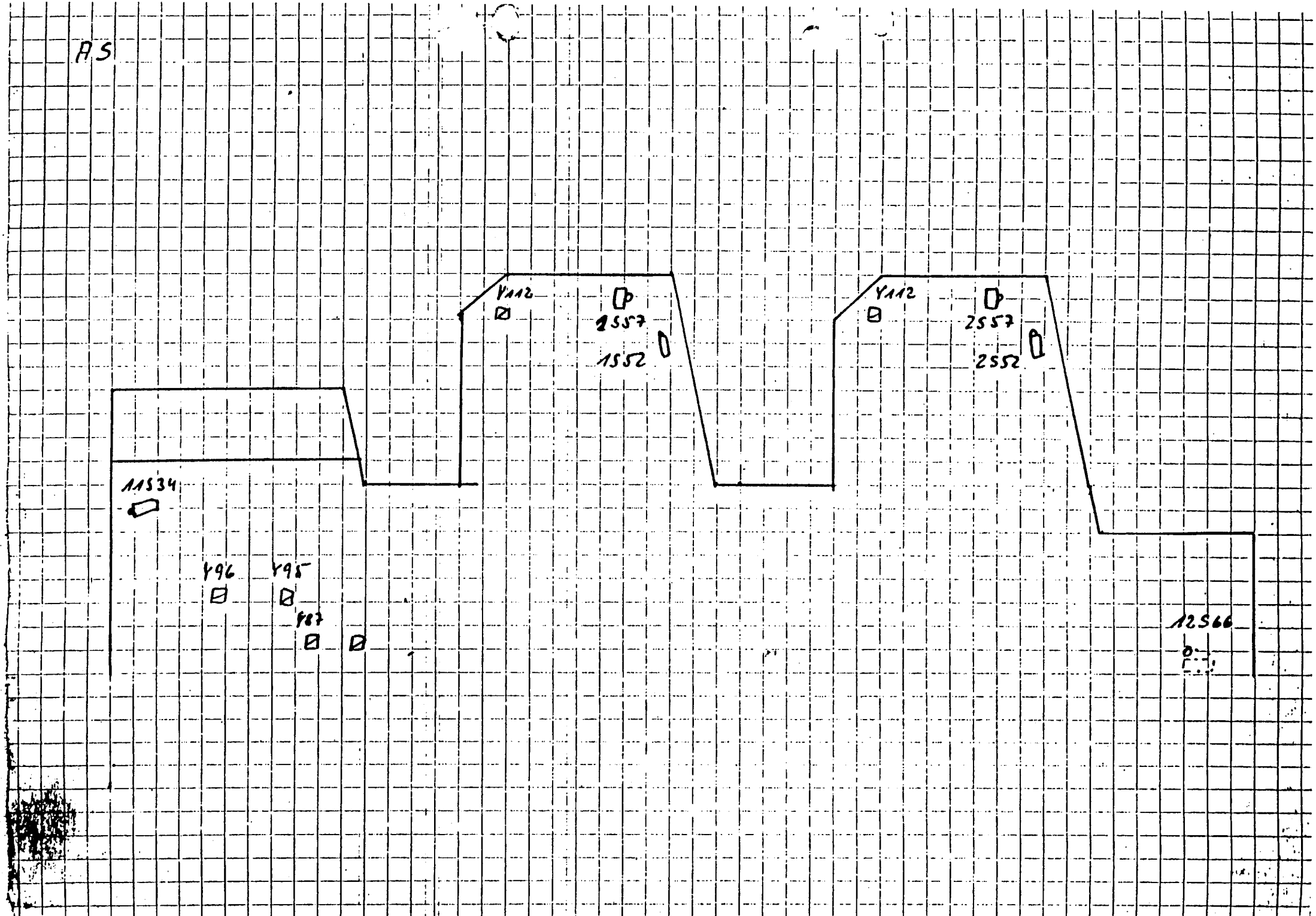
Side view SM 52-2

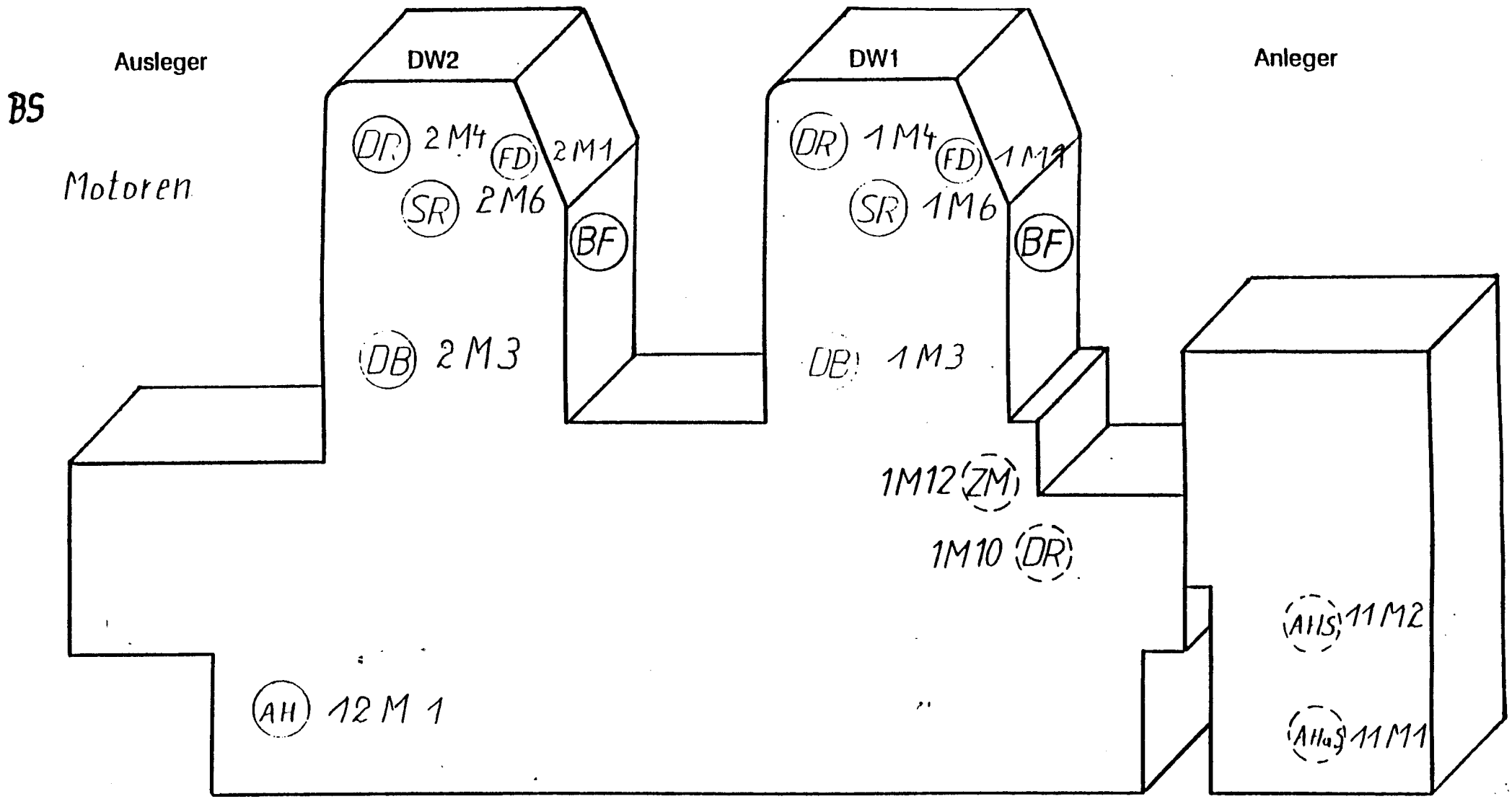
■ Equipment on the operator side O.S.

□ Equipment on the drive side D.S.

▲ Equipment which can be allocated neither to the operator nor to the drive side.

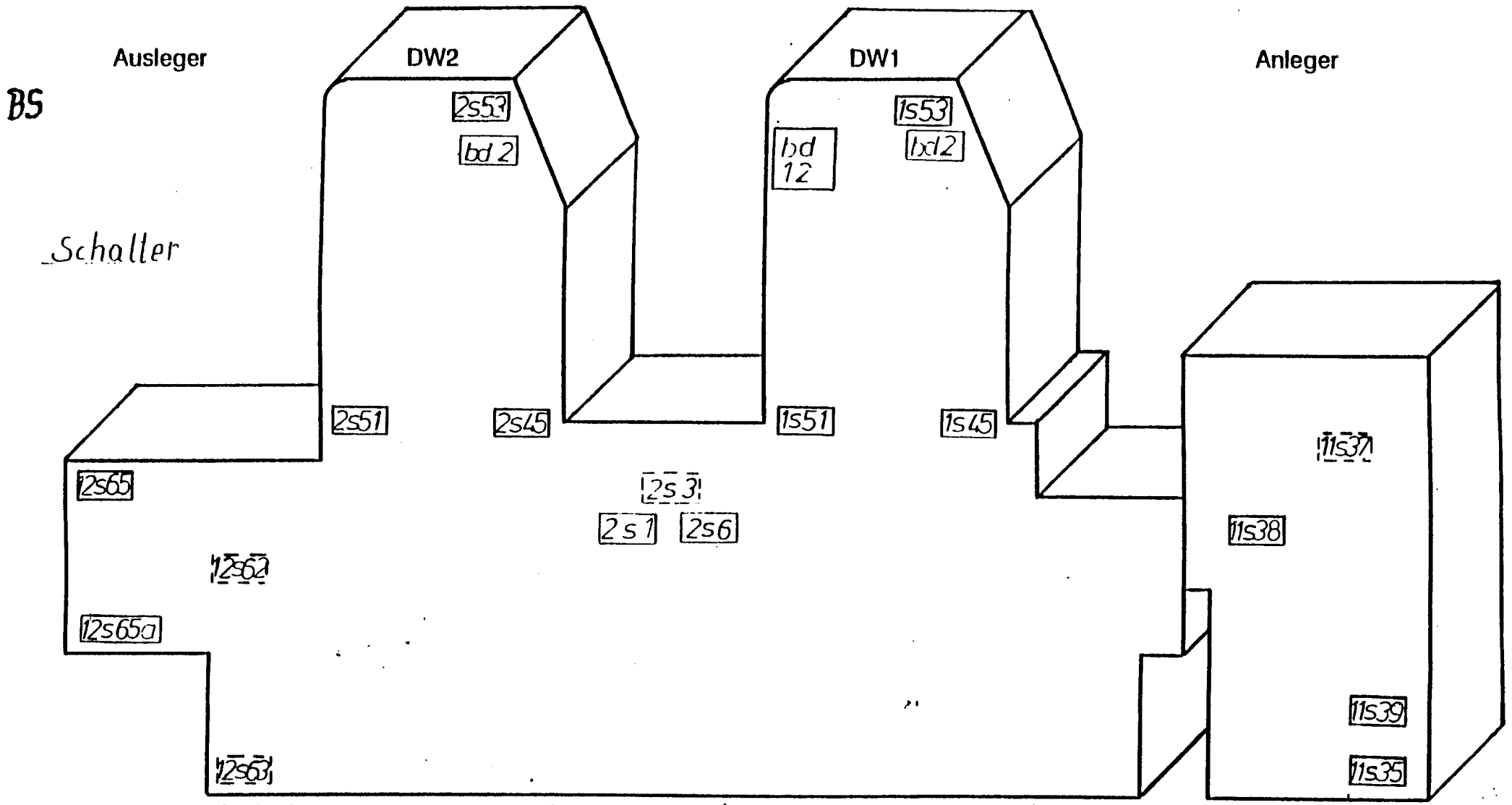

BS
BS
2553
BS 2fa
2561
2545
12565
Y114
Y117
Y113
Y104
Y111
Y122
Y121
Y119
Y118
Y110
Y124
12562
12563
BS
11fa
1553
BS 2fa
1551
1545
11537
11538
11539
11535
Y114
Y115
Y117
Y113
Y104
Y111
Y122
Y121
Y119
Y118
Y110
Y124


AS
Y112
1557
1552
Y112
2557
2552
11534
Y96
Y95
Y87
12566



1M3 bzw 2M3	Druckbeistellung	
1M4 bzw 2M4	Diagonalregister	
1M6 bzw 2M6	Seitenregister	
1M1 bzw 2M1	Feuchtduktor	
11M1	Anleger Hauptstapel	
11M2	Anleger Hilfsstapel	
12M1	Ausleger Hauptstapel	
BF	Blasleiste Feuchtung XEA 123	
BF	-	Blasleiste Feuchtung
1M12	-	Zeichmarke
1M10	-	Druckfreier Rand

[ ] = Innenseite der Maschine

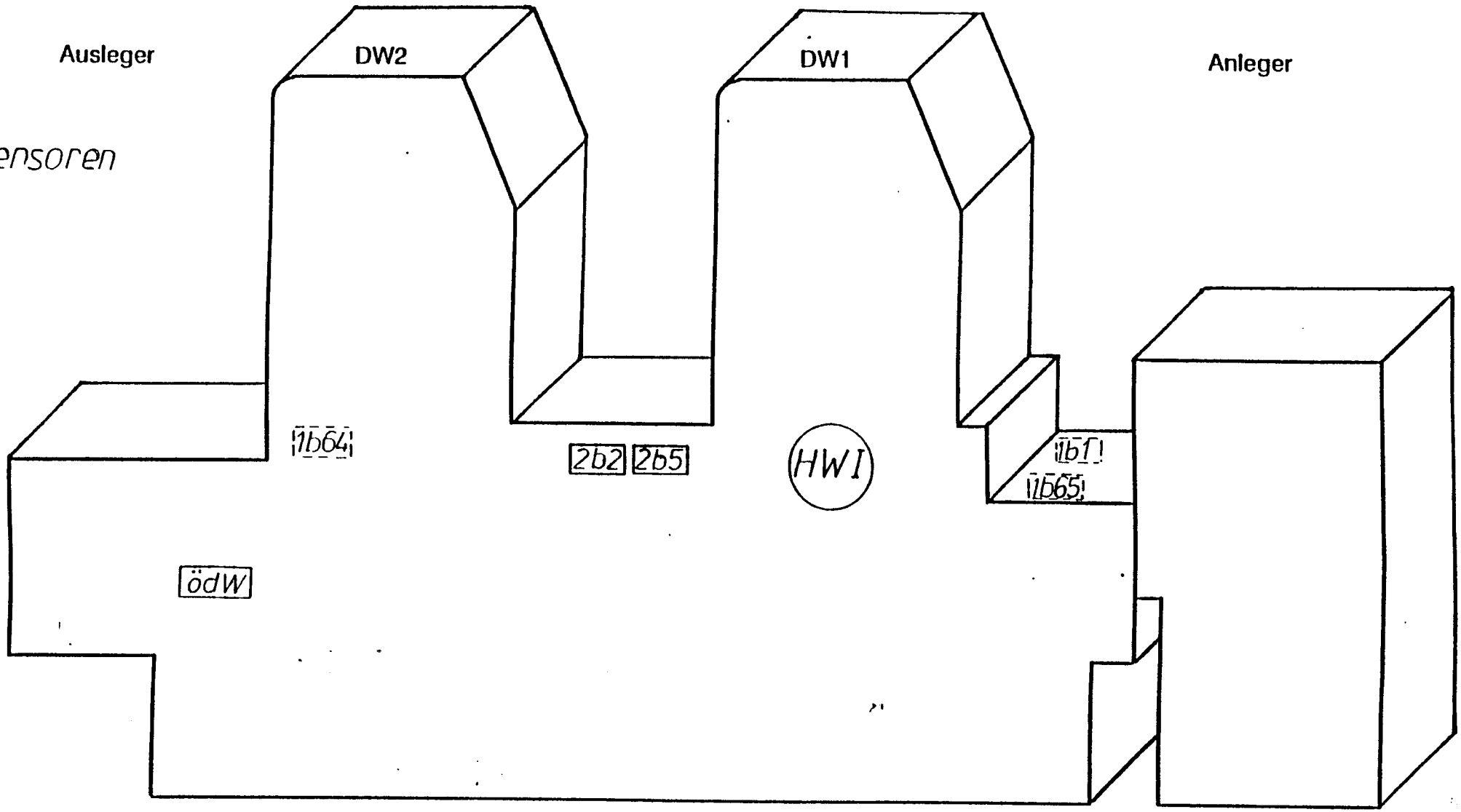


12 s 65	Plexischutz	2 s 45	Schutzgitter Feuchtwalzen	1 s 45	Schutzg. Feuchtwalzen	11 s 37	Hilfsstapel oben
12 s 65a	Papiersicherheit	2 s 51	Fingerschutz	1 s 51	Fingerschutz	11 s 38	" unten
12 s 62	Stapelbegrenzung ob.	2 s 53	Schutzgitter Farbwalzen	1 s 53	Schutzgitter Farbwalzen	11 s 39	Endbegr. Stapelplatte
12 s 63	" unt.	2er BD	Kleine Bedienstelle	2er BD	Kleine Bedienstelle	11 s 35	Hauptstapel unten
		2 s 3	Kurvenrolle Wendung	12 BD	Große Bedienstelle		
		2 s 1	Fehlbogenüberwachung				
		2 s 6	Klinke Formatumstellung				

[ ] = Innenseite der Maschine

BS

Sensoren

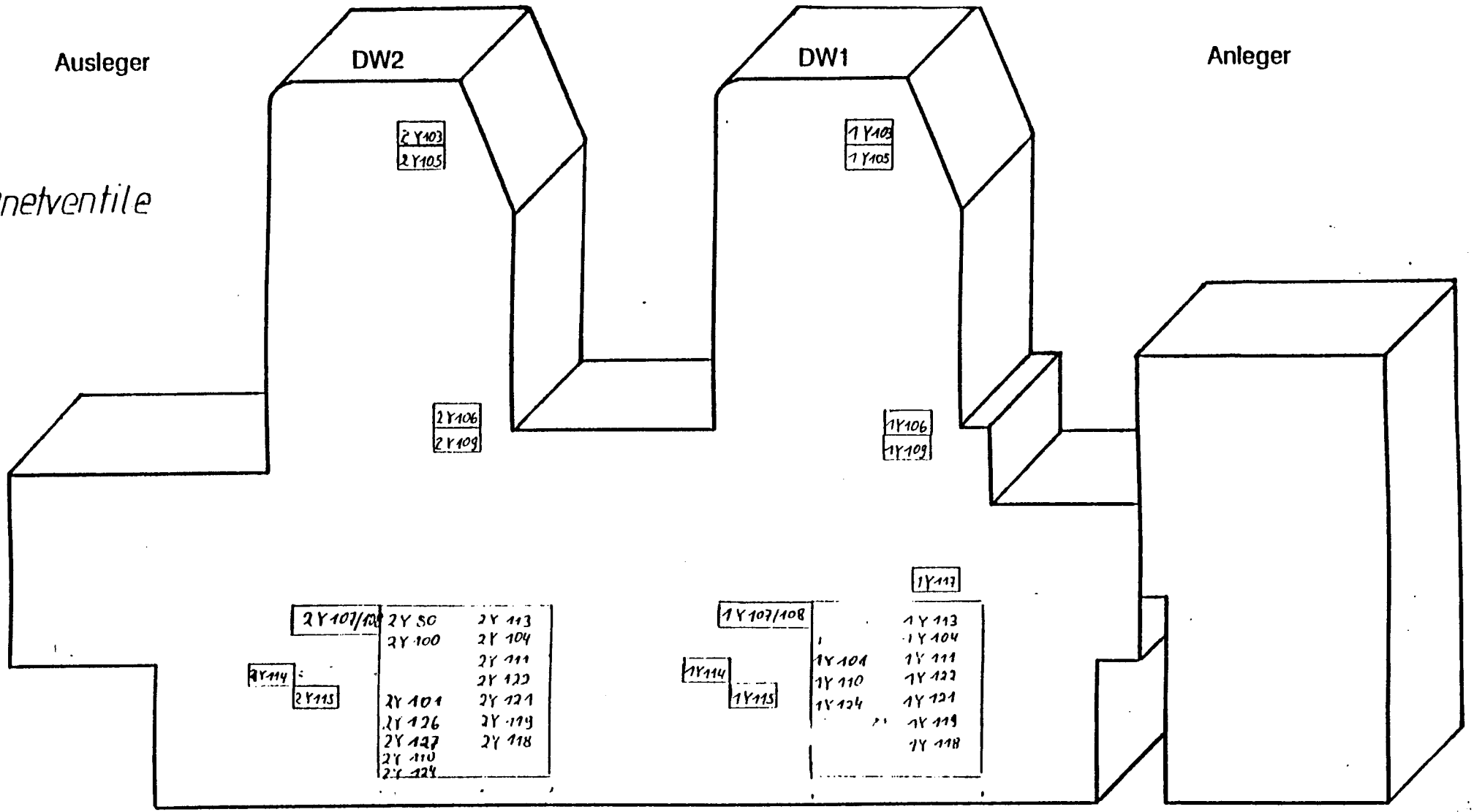


1	b	65	Doppelbogenkontrolle
2	b	2	Überwachung Umstellung
2	b	5	Bolzenposition
1	b	1	Fehlbogenüberwachung
1	b	64	Nummernerwerksschutz
H	WI		Inkrementalgeber
Ö	DW		Öldruckwächter

[ ] = Innenseite der Maschine

BS

Magnetventile

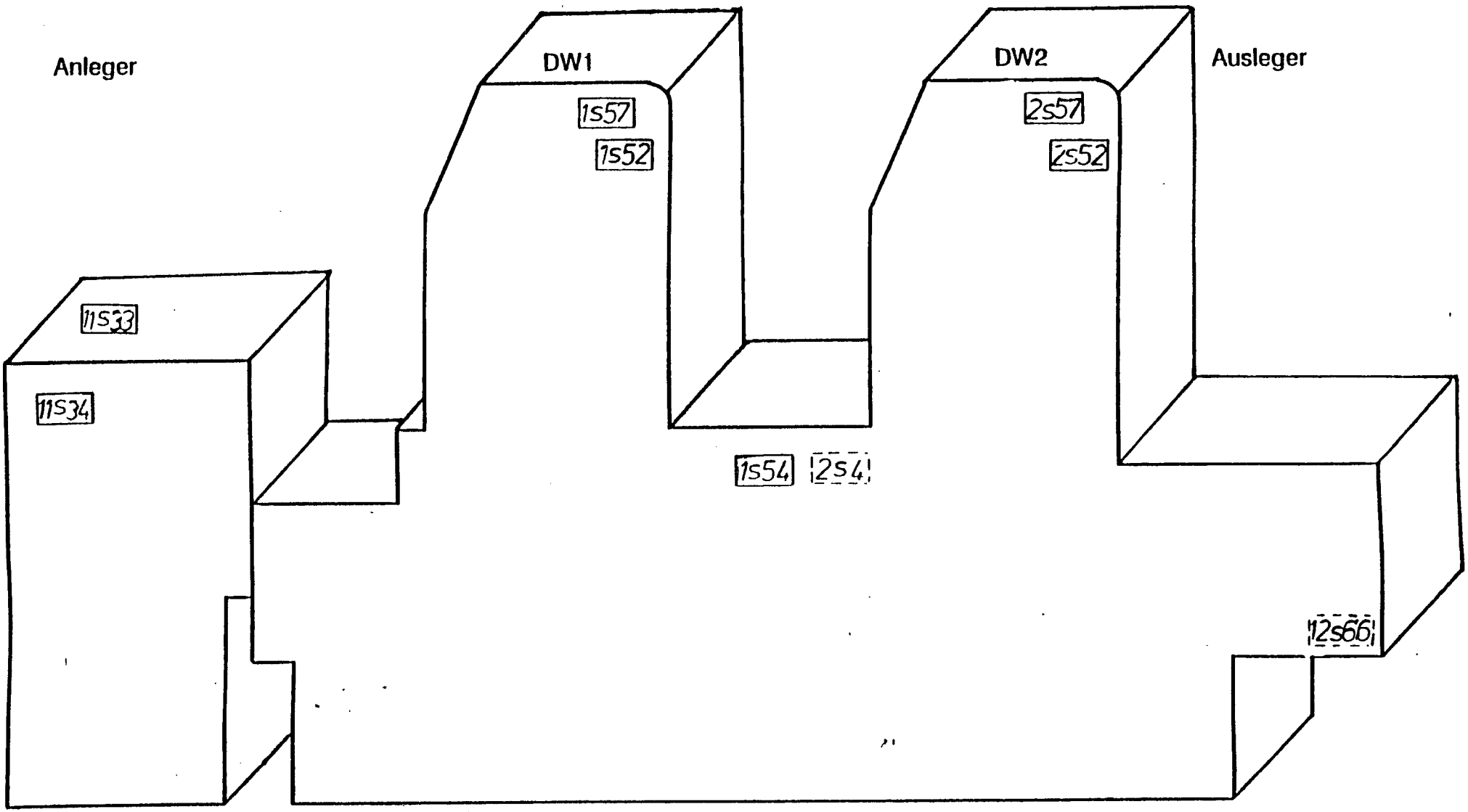


[ ] = Innenseite der Maschine

2Y 101	GT Wascheinr. schwenken
2Y 103	FW Waschmittelzufuhr
2Y 104	Wäschiakelanstellung FW
2Y 105	Waschwasser FW
2Y 106	Waschmittel GT
2Y 107	Waschrakel GT Stufe 1
2Y 108	" " " 2
2Y 109	Waschwasser GT
2Y 110	Zwischenwalze Farbe ab
2Y 111	Farbauftragswalzen
2Y 113	Feuchtwalzen
2Y 114	Druck an Stufe 1
2Y 115	" " " 2
2Y 118	Vorderkante
2Y 119	Hinterkante
2Y 121	Dichtdurchführung
2Y 122	Andruckrolle Pl. Hinterk.
2Y 124	Schaltwalze FW
2Y 80	Formateinstellung Wendung
2Y 100	Anstellung Wendetrommel
1Y 117	- Vorgreiferspeise
1Y 126	Nummerieren ein
1Y 127	Nummerierwerk ein

= Innenseite

AS



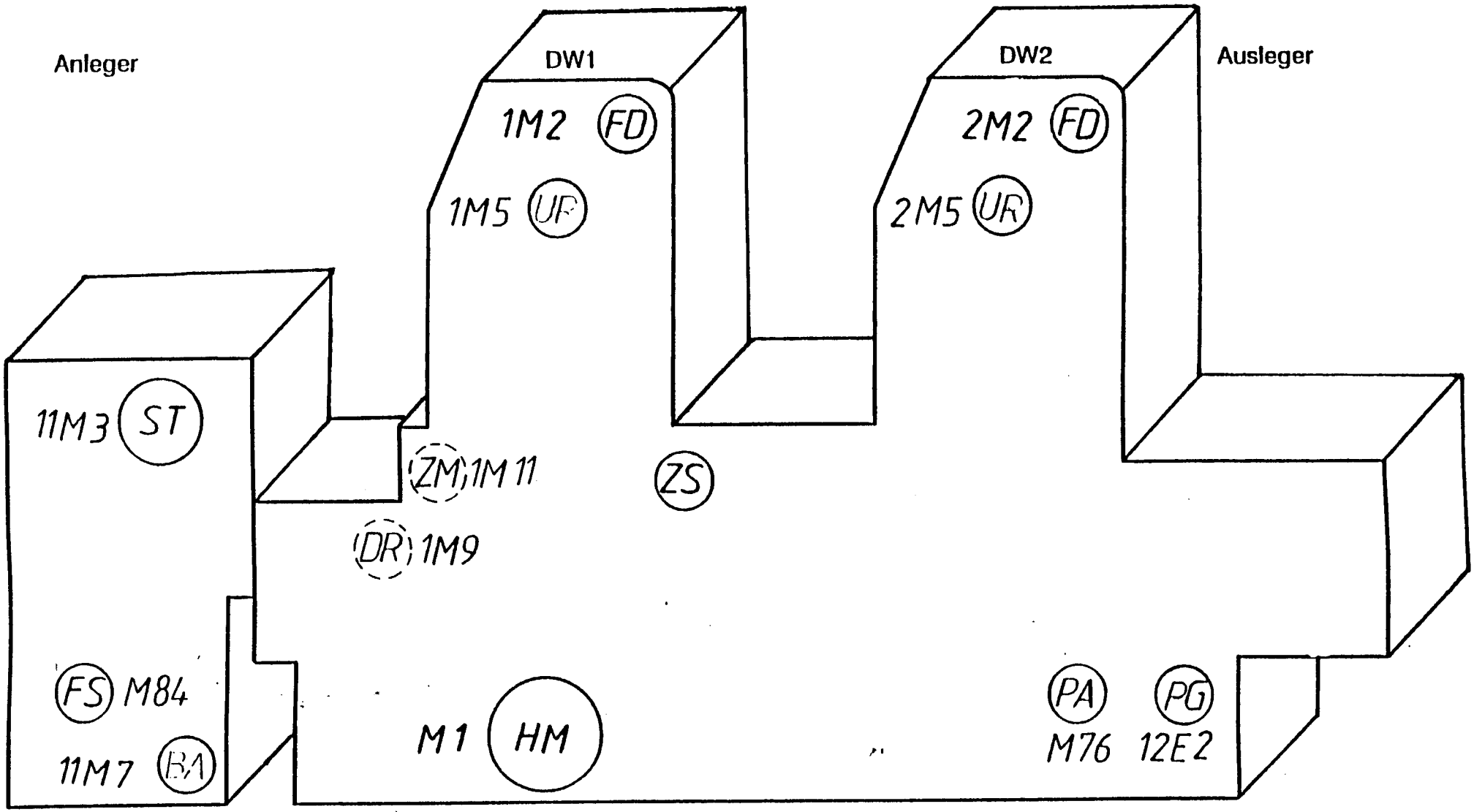
11 s 33 Endbegr. Saugkopf
11 s 34 Hauptstapelbegr. oben

1s 52 Schutzgitter Pl. Zyl.
1s 57 Farbwerk Schutz
1s 54 Handkurbel

2 s 52 Schutzgitter Pl. Zyl.
2 s 57 Farbwerkschutz
2 s 4 Wendetrommel

12s 66 Stapelrechen

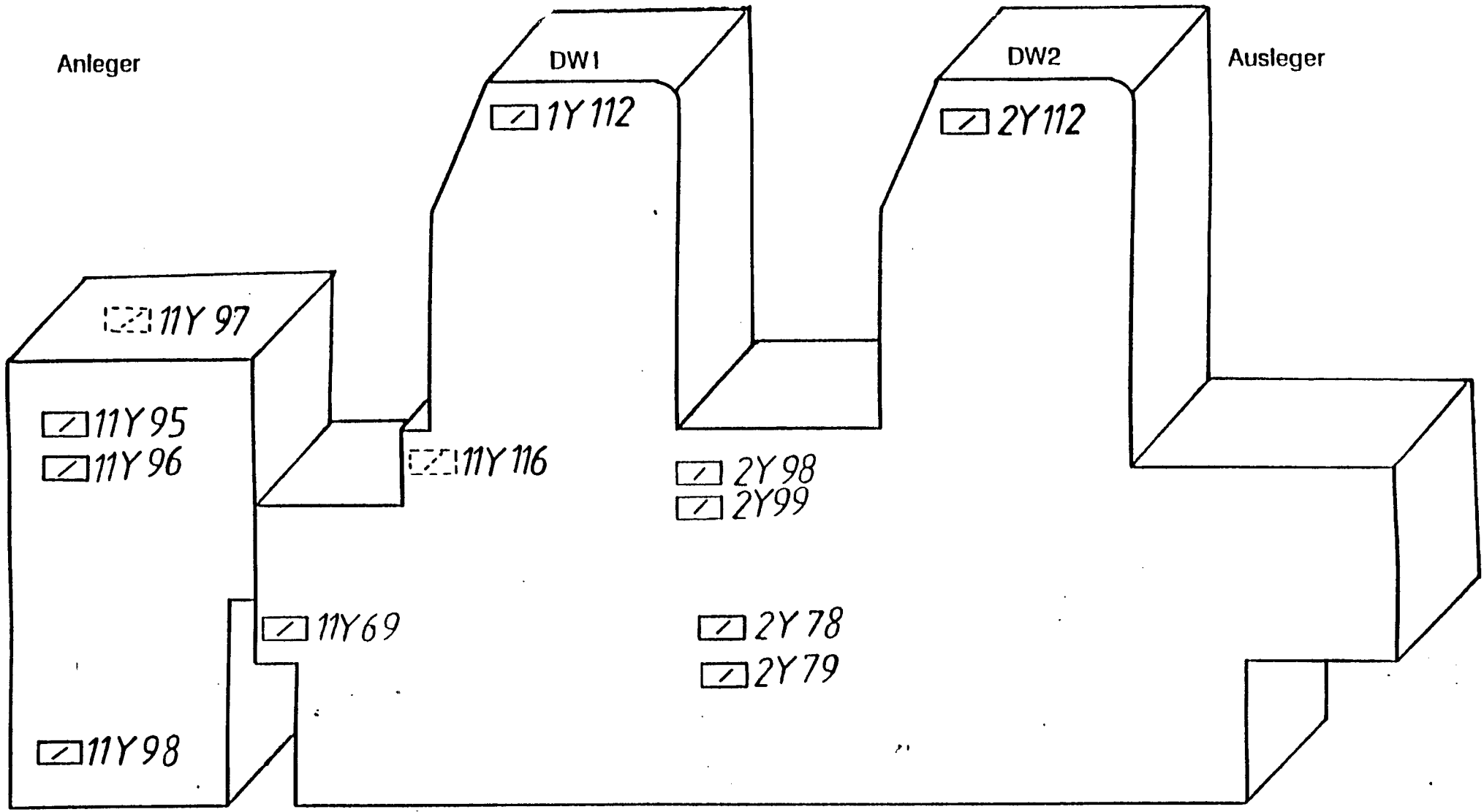
AS



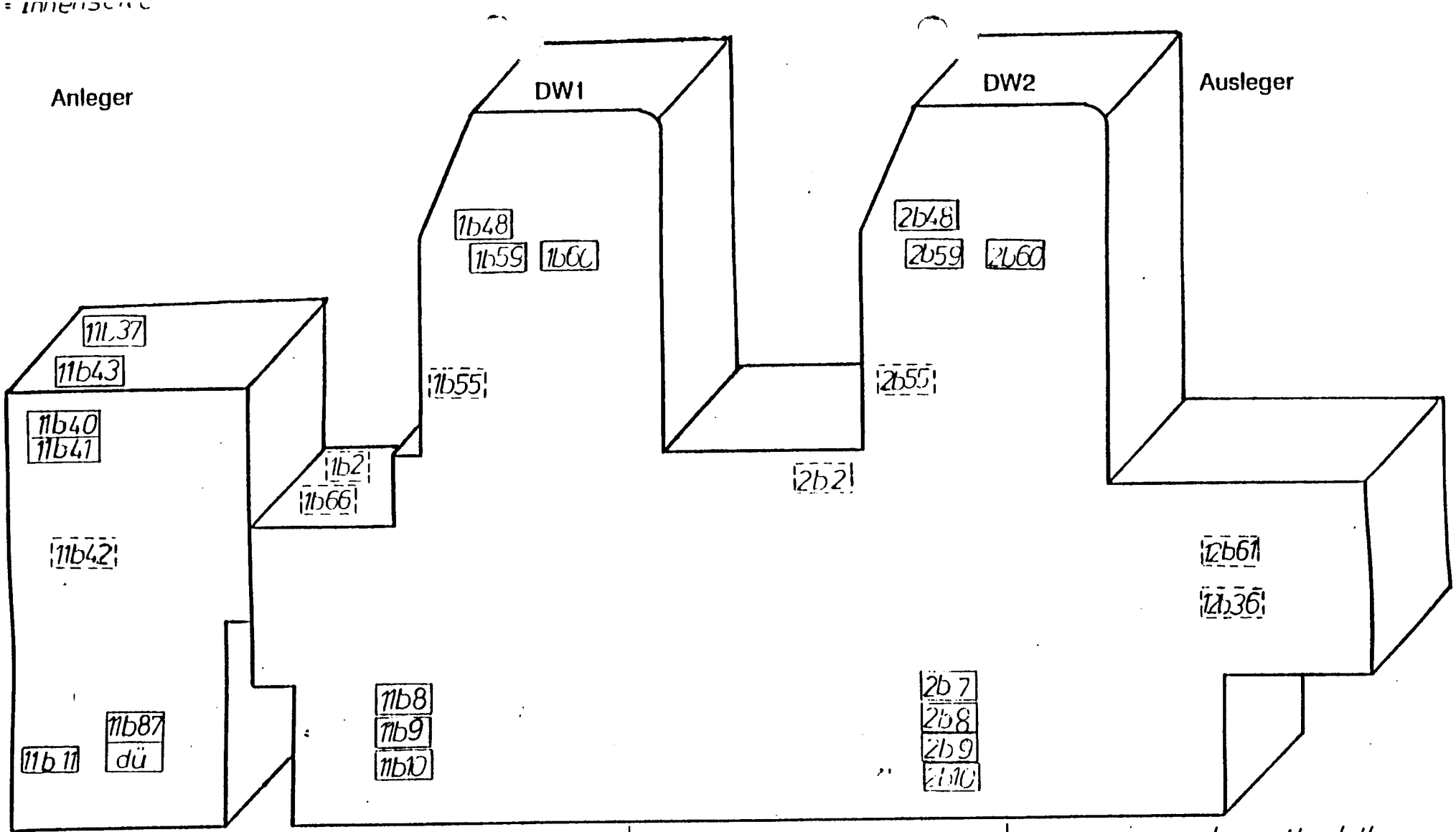
M 1 Hauptmotor
1M2 bzw 2M2 Farbduktoren
1M5 bw. 2M5 Umfangregister
11 M 3 Saugbandtisch
11 M 7 Bogenankunftsregelung
ZS Zahnsegment Wendung
FS Fettschmierung
PG Pudergerät
PA Puderapparat

ZM - Zichmarke
DR - Druckfreier Rand

= Innenseite



11 Y 69	Anlegerkupplung	1 Y 112	Tonheber DW 1	2 Y 78	Hydraulik Druck 1
11 Y 95	Blasluft	2 Y 112	" DW 2	2 Y 79	" " 2
11 Y 96	Sauglult			2 Y 98	Kupplung Motor (Wendung)
11 Y 97	" Umschaltung			2 Y 99	" Zahnsegment (Wendung)
11 Y 98	Gesamtluft				
11 Y 116	Stoßfinger				

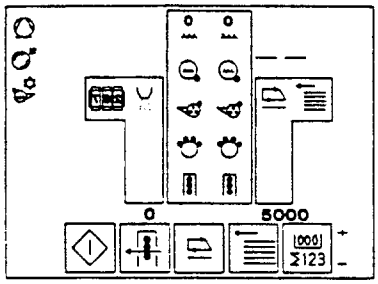


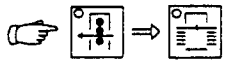
11 b 8	Sensor	Waschmittel (Füllstand) GT u. Druckzylinder	1 b 48	Grobreg. Plattenzylinder	2 b 2	Überwachung Umstellung
11 b 9	"	" (") FW	1 b 55	Niveaufühler Feuchtmittel	2 b 7	Hydraulikdruck 0
11 b 10	"	Waschwasser (") GT u. FW	1 b 59	Waschemrichtung	2 b 8	" 1
11 b 11	"	Fettpumpe	1 b 60	Schlitzscheibe Waschf.	2 b 9	" 2
11 b 40	"	Luftsteuerung Anleger	1 b 66	Doppelbogenkontrolle	2 b 10	Ölstand Hydraulik
11 b 41	"	Saugband langsam (Einzelb./Schuppen)	1 b 2	Lichtlauge		
11 b 42	"	Umschaltung Haupt/Hilfsstapel	12 b 36	Stapeltisch Auslage		
11 b 43	"	Schleppsauger	12 b 61	Stapelüberwachung		
11 b 37	"	Tastfuß				
Dü	"	Überdrucküberwachung				

Selectable functions

Displays

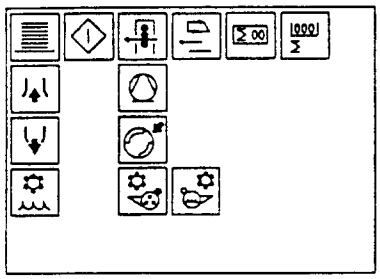
Display "Entire press (production run display)"



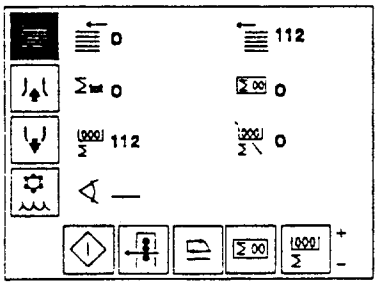


Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Run on			•			
	Production run on			•			
	Feeder on/off			•			
	Paper on/off			•			
	Enter total number of impressions			•			

Display "Entire press"

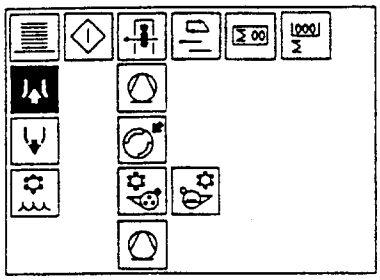


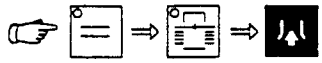
Display "Entire press/paper run"



Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Run on			•			
	Production run on			•			
	Feeder on/off			•			
	Activate daily counter			•			
	Job counter on/off			•			

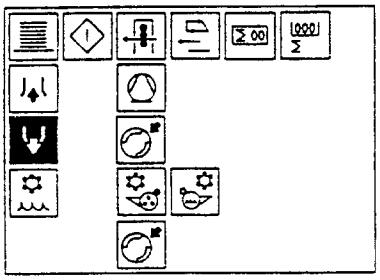
Display "Entire press/suction air"

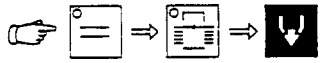




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Compressor feeder/delivery on/off	M71		•			

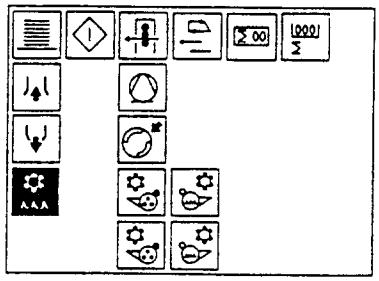
Display "Entire press/blast air"

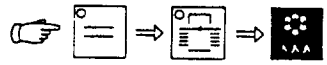




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Blower reversing drum on/off	M82		•			

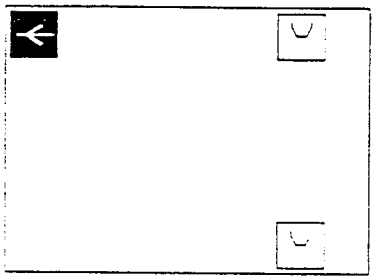
Display "Entire press/cooling"

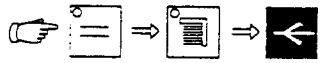




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Inking unit temperature control on/off	E78		•			
	Dampening solution cooling on/off	E79		•			

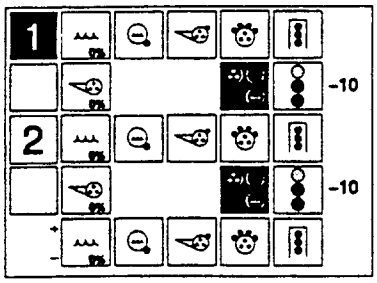
Display "Delivery/paper run"

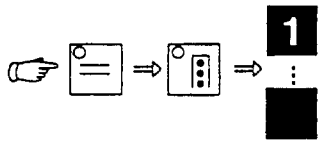




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Powder spray device on/off	M76		•			

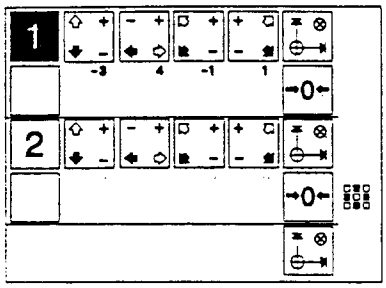
Display "Printing unit"

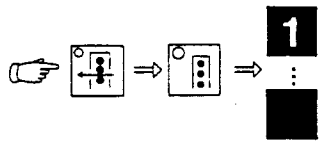




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Dampening on/off	nM1		•			
	Dampening rollers on/off	nY113		•			
	Ink ductor on/off	nY112		•			
	Inking form rollers on/off	nY111		•			
	Impression on/off	nY114 nY115		•			
	Intermediate dampening roller on/off	nY110		•			
	Adjustment of printing pressure	nM3		•			
	Ink fountain roller speed	nM2		•			

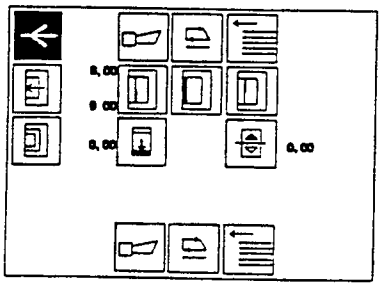
Display "Printing unit"

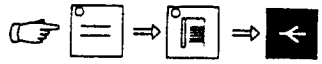




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Registers zero			•			
	Register display zero			•			

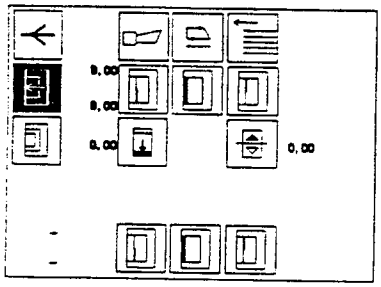
Display "Feeder/paper run"

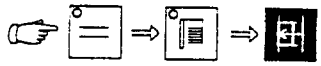




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Audible signal device pull lay control on/off			●			
	Feeder on/off			●			
	Paper on/off			●			

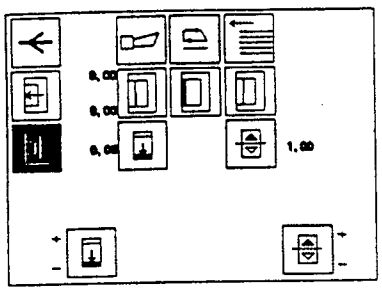
Display "Feeder/sheet infeed"

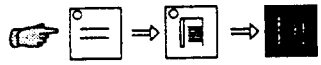




Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Print-free margin O.S.	1M10		●			
	Print-free margin D.S. and O.S.	1M9 (D.S.) 1M10 (O.S.)		●			
	Print-free margin D.S.	1M9		●			

Display "Feeder/sheet-size adjustment"





Symbol	Description	Selected equipment/motor/ pneumatic valve	Remark	Exists on SM52			
	Adjustment of pull lays	1M11 (D.S.) 1M12 (O.S.)		●			
	Entering the off-centre position			●			