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1. GENERAL DESCRIPTION

The type 64 VAT-valve controller controls a series 64 gate valve powered by a stepper motor. The controller can be activated by either a process controller, a relay logic, a pressure controller or a micro computer.

whe valve controller as an intelligent servo-subsystem will regulate any valve position with great accuracy.

Set to Manual operation, the controller allows the operator to open or close the valve, or to stop it in any position by pushing the corresponding button. With the controller set to remote, any valve position can be reached by using one of the following modes of command: 0-10V analog, wired OPEN - CLOSE, or RS 232 optional. In the AUTOMATIC position, the valve position can be controlled by external digital pulses.

The front panel controls select the modes of operation "automatic" or "manual"; place of operation LOCAL or REMOTE and include finger tip controls for OPEN or CLOSE. A LED-line shows the actual valve position from fully open to fully closed.

The rear panel holds three plug connectors. The valve connects to the controller through a 12 pin BURNDY connector. Communication between valve controller and pressure controller is possible through a 5 pin DIN connector. A 25 pin CANNON conector provides access to the periphery.

2. SPECIFICATIONS

2.1. INPUT POWER

Voltage:	230 VAC or 115 VAC (to be specified)
Tolerance:	+/- 15%
Consumption:	max. 200W
Fuse values:	115 VAC - 4A slo blo
	220 VAC - 2,5A slo blo

2.2. INTERFACE (25-pin CANON - connector)

for pin assignments see item 3.2.2.

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-Inputs:

- OPEN — TTL Compatible
- CLOSE — achieve low (0-1V)
- ANALOG VOLTAGE INPUT: 0-10V (10V = closed)
  (to set valve position) (input impendance 50k Ohms)

- Outputs:

- end position OPEN { active low
- end position closed { open collector output
- in position { (max 24V, max 100ma)

- Serial communication interface RS232C

- the controller can be delivered with an optional RS232C serial communication interface.(for details see item 3.2.3 and item 6.)

2.3. VALVE CONTROL (12 pin BURNDY - connector)

for pin assignments see item 3.2.1.

- position potentiometer
  - supply voltage : 7V short circuit proof
  - wiper input impedance : >100 k ohm
    (for d.c. voltage infinity, overvoltage proof)
- stepping motor outputs: Imax=5A, U=40V two pulsed power switching units in H-bridge configuration, with backing by current regulation are used to realize sinusoidal phase-currents.

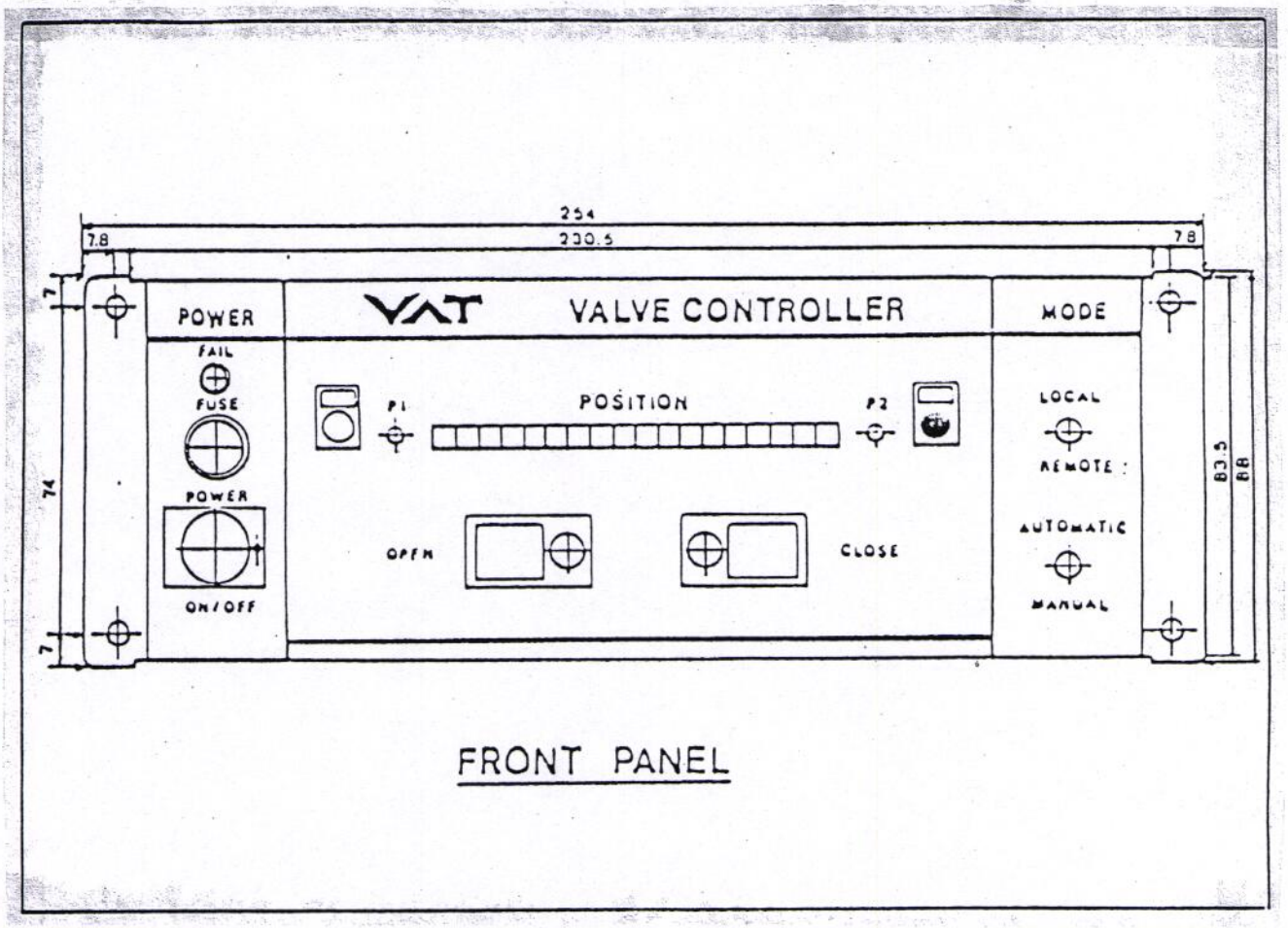
2.4. GENERAL

- temperature range:	0-50 C (32-120 F)
- ability to reproduce valve position:	app. 1% (of total valve opening)
- dimensions:	10 W X 3.5 H X 12.2 D INCHES
- Weight:	13.64 LBS.

3. CONTROLS

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3.1. FRONT PANEL CONTROLS



FRONT PANEL

3.1.1. POWER ON/OFF - Switch

The switch is illuminated when the power is on. If the fuse needs to be replaced the LED above the fuse will light. Switch off power before replacing fuse, for fuse values see item 2.1.

3.1.2. OPEN - push button

Pushing this button will move the gate toward the open position. When the controller is set to local and manual the gate will stop when the button is released, or when the open limit switch indicates by a light on the button that the valve is fully open.

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3.1.3. CLOSE - push button

Pushing this button will move the gate toward the closed position. When the controller is set to local and manual. The gate will stop when the button is released, or when the closed limit switch indicates by a light on the button that the valve is fully closed.

3.1.4. LOCAL/REMOTE - switch

Selects the place of operation - either directly at the controller or externally.

3.1.5. MANUAL/AUTOMATIC - switch

Selects the mode of operation, i.e., the controller will follow the commands received through the DIN-connector AUTOMATIC or MANUAL

3.1.6. POSITION DISPLAY (diode line)

A line of sixteen yellow LEDs indicates the valve position. One red LED at each end of the line, together with the potentiometers (P1, P2) next to them, are used to adjust the position signal processing. With the valve in the open position adjust the potentiometer (P1) by turning it until the corresponding red LED lights up. Close the valve and adjust (P2) the same way.

3.2. MODES OF OPERATION

LOCAL/MANUAL: The OPEN/CLOSE switches allow manual control of the valve. The valve will move in the direction indicated as long as the button is pressed.

LOCAL/AUTOMATIC: The valve controller serves as a

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control element for a pressure controller. Therefore, the valve controller will be connected to the pressure controller by a cable with DIN-connectors. This mode of operation is only significant if a pressure controller is used.

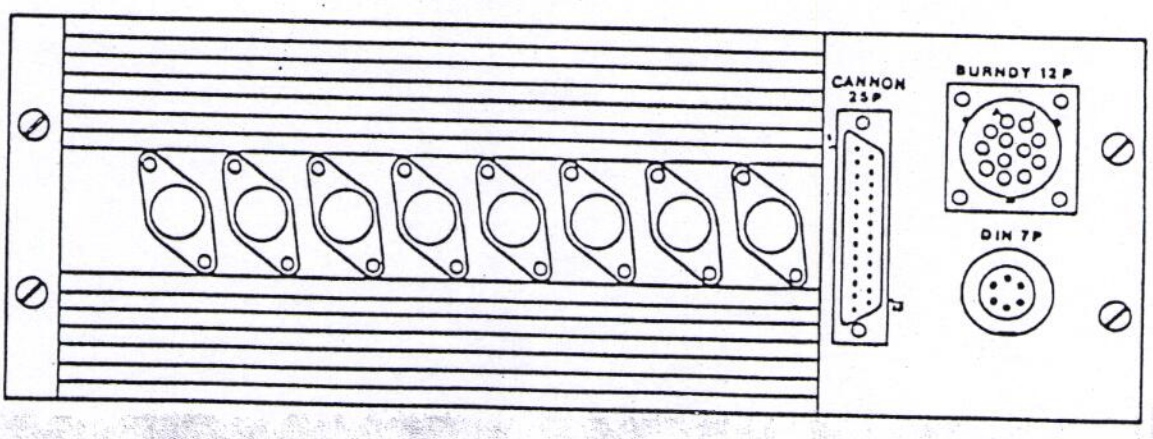
REMOTE: The valve controller is operated by external commands. Communication is possible through a 25-PIN CANNON-connector (see item 3.3.2. for details)

REMOTE CLOSE (PIN NO.16)	REMOTE OPEN (PIN NO.17)	PLACE OF OPERATION
0	1	valve closes
1	0	valve opens
1	1	valve stops with holding moment
0	0	operation as a servo system with command through an analog voltage interface 0-10V or with the RS232C option through an asynchronous interface.

"1" means the PIN (16 or 17) is grounded (PIN 19)

3.3. REAR PANEL CONTROLS

REAR PANEL



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3.3.1. VALVE (12 pin BURNDY - connector)

PIN A	Stepping motor phase 1
PIN B	Stepping motor phase 1
PIN C	Stepping motor phase 2
PIN D	Stepping motor phase 2
PIN G	Limit switch common
PIN H	Limit switch open
PIN J	Limit switch closed
PIN M	Position potentiometer 7V
PIN L	Position potentiometer sliding contact
PIN K	Position potentiometer ground
PIN E	Ground

3.3.2. INTERFACE (25-pin CANNON-connector)

PIN 1	RS232C
PIN 2	RS232C TXD
PIN 3	RS232C RXD
PIN 4	RS232C RTS
PIN 5	RS232C
PIN 6	RS232C
PIN 7	RS232C GND
PIN 8	RS232C
PIN 20	RS232C DTR
PIN 14	ANALOG VOLTAGE INPUT (0-10V), (10V=closed)
PIN 7	ANALOG VOLTAGE INPUT (GND)
PIN 16	REMOTE CLOSE INPUT
PIN 17	REMOTE OPEN INPUT
PIN 21	VALVE CLOSED OUTPUT {
PIN 22	VALVE OPEN OUTPUT { (open collector)
PIN 18	IN POSITION OUTPUT {
PIN 19	GROUND EXTERNAL
PIN 15	+5V (EXT)

For more details about the RS232C interface see item 6.

Maximum length for RS232C cable: 25M with 4800 BAUD

3.3.3. PRESSURE CONTROLLER (7-pin DIN-connector)

pin 2	upclock pulses of min 5V/max 12V
pin 3	downclock pulses of min 5V/max 12V
pin 7	position: valve position voltage (0,7-6V)
pin 1	gnd.: ground

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4. INSTALLATION AND OPERATION

PLease read and understand all instructions before operating the controller. Failure to observe the installation and operating instructions can invalidate our warranty.

4.1. INSPECTION AFTER SHIPMENT

Reasonable care has been taken to pack the VAT-64 controller so that it arrives in perfect condition. However, you should check for dents.cracks or broken controls and connectors to be sure that it has not been damaged in shipping. If you find any damage, notify your carrier and VAT immediately.

4.2. MOUNTING

The VAT-64 can be mounted in an instrument panel or placed on a bench, A rack mounting kit is enclosed with the controller. Do not damage the front panel when mounting brackets. The unit will run much cooler if convection air circulation is allowed to the rear panel.

4.3. PUTTING INTO OPERATION

4.3.1. Connect the valve controller to the valve by using the cable with the 12-pin BURNDY-connector

4.3.2. To use the remote feature plug in the interface connector (CANNON.25-pin)

4.3.3. To use the valve controller together with a pressure controller, connect the two units using the cable with the 7-pin DIN-connector.

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4.3.4. Before plugging in the AC line cord. push the power switch to the off position (raised). The main voltage must not vary more than 13% from the specified voltage indicated.

4.3.5. Switch the controller to LOCAL and MANUAL.

4.3.6. Turn on power. If the POWER ON/OFF switch doesn't light up, check the red POWER LED and the fuse. Check value of the fuse according to item 2.1. If no defect can be traced contact your maintenance service. If the trouble is traced to the VAT controller, call (800-VAT-LOCK).

4.3.7. ADJUSTING OF THE VALVE POSITION-FEEDBACK TO THE LED-LINE P1,P2 OF THE FRONT PANEL

There is a potentiometer built into the valve driver. Its resistance corresponds to the valve position. Minimum and maximum reading of this potentiometer has to be adjusted to the limit switches OPEN and CLOSED. Set to MANUAL and LOCAL, the valve moves between the two limit switches. Set to REMOTE (analog, RS232C, ETC.), the valve moves between the red LEDs at the end of the LED-line. Even with a maladjustment, the valve will not run over the limit switches.

ADJUSTMENT: Open the valve completely with the valve controller set to LOCAL/MANUAL. During the opening of the valve, the illuinated LED will move to the left. In th fully open position, the red LED in th open button will light up - limit switch open. Turn the potentiometer P1 until the left red LED lights up. The last yellow LED will also remain on. Adjust position CLOSE the same way: close the valve until the red LED in the CLOSE button lights up. Adjust potentiometer P2 until the red LED at the right end of the LED line lights up. Open and close the valve several times to check the adjustment.

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4.3.8. If you're using the POWER FAILURE OPTION, the fail safe position has to be set. The controller has been adjusted at the plant to CLOSE at a power failure. If you want them to OPEN you have to switch over the DIL-switch "S2" (see drawing of the masterboard for location of the switch).

4.3.9. If you are using the RS232C OPTION the baudrate has to be set by means of the DIL-switches "JA" and "JB" (see also item 6.2 and RS232C BOARD- drawing for location).

4.3.10. Select mode of operation by setting the switches - LOCAL/REMOTE and AUTOMATIC/MANUAL.

5. THEORY OF OPERATION

5.1. POWER SUPPLY SECTION

Two power output stages (both in H-bridge configuration) are used as power switch elements for the pulse with modulated square wave signals (chopper-operation) necessary for the two windings of the stepping motor. The clock frequency is approximately 25 KHZ. the inductance of the motor windings allows the integral behaviour of the winding current relative to the voltage rectangles. The current of each winding is measured and is with an integrated control pulse with modulation module 3524A, followed-up a prescribed rated value of the current. The wave shape of the rated value of the current, corresponds to a sinusoidal step function that allows an operation of the stepping motor with little resonance. The rated value of the current is produced by a modulo 16 counter 4019B, followed by a decoder module 4028 and an analog rating of the decoder out-puts by 8 each resistors. The adding module 4008 causes the 90 degree phase displacement between the two phases. At this time the binary value 4 is added to the result of count of the modulo 16 counter . The following decoding and D/A-conversion happens as with phase 1. An "up" respectively "down" impulse at the "clock" inputs of the modulo 16 counters corresponds to a quarter-step of the stepping motor.

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5.2. LOGIC SECTION

This function is used for the logical operation, selection and interlock of the operation modes, the switching off of the end position, the fixing of the fail-safe position and change the direction of rotation. The input and output-signals for the remote-operation are galvanically separated by the periphery interface. This section also provides the input of the VOC-control voltage and the reversal of the direction in the positioning operation.

5.3. POSITION SIGNAL PROCESSING

The potentiometer mounted to the VAT-valve converts valve postions into wiper voltages. A precision DC-source (7V) supplies the potentiometer. A precision rectifier circuit with a variable gain and an offset compensation, provide a calibrated position voltage. This position voltage signal has to be adjusted with the potentiometers (P1, P2) on the front panel. The red LED of the LED-line should light up simultaneously with the red LED of the open/close push button.

5.4. POSITION INDICATION

A LED-line with 16 yellow LEDs indicates the valve position. The red LEDs at each end of the line are used to adjust the position signal processing with the potentiometers P1,P2.

5.5. POSITION CONTROL

The position control module consists of a reference input processor, the PD-position controller, the precision rectifier, a voltage controlled oscillator (VCO) and the necessary reverser. Because of the capability of setting the

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position reference either by the RS232 option or by an analog signal (0-10V), it is necessary to dial the reference source you wish to use. This can be done by selecting the corresponding resistor on the master board (see drawing of the master board). The position control subtracts the actual value from the reference input and produces the PD performance. The interconnection of a precision rectifier accepts the uniploar control voltages only by the VCO. The reversal of direction defines the meaning (open, close) of the pulses produced by the VCO. These pulses are fed into the counter 40193 (see item 5.1).

5.6. REMOTE INTERFACE

(for pin assignments see item 3.3.2)

The operation modes "REMOTE, OPEN" and "REMOTE, CLOSE" allow the external control of the VAT-64 valve controller. The inputs at the 25-pin CANNON-connector are galvanicaly separated from the valve controller by means of optical-coupling capacitors. These inputs are active-low and TTL-compatiable (4.7 K OHM internal pull up resistance against + 5V). The necessary reference potential (ground) is available at pin 19 of the 25 pin CANNON connector. As a feedback of valve position, three galvanically separated outputs are available. These outputs are "open collector outputs"; they are active low and also referring to the ground potential (pin 19). The max. voltage burden is 24V. It is internally limited by a zener diode. The feedback includes information about the "fully open", the "fully closed" and the "controlled" (actual position equal to reference position) valve position.

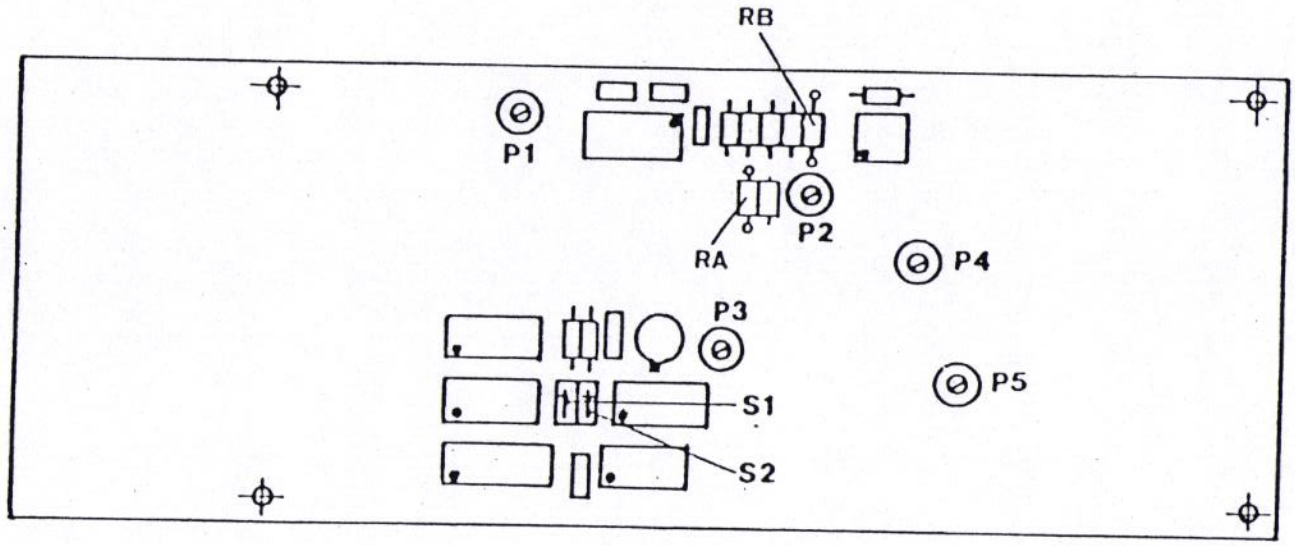
5.7. POWER SUPPLY

The transformer accepts 230VAC or 115VAC (50/60). (check identification plate). On the secondary side, 32VAC, 15VAC, and 7.5VAC are available. All secondary outputs are protected at the power supply by fuses. On the DC side +40V, +15V unregulated and two times +12V regulated are available. The -12V auxiliary voltage is produced by a +/- converter.

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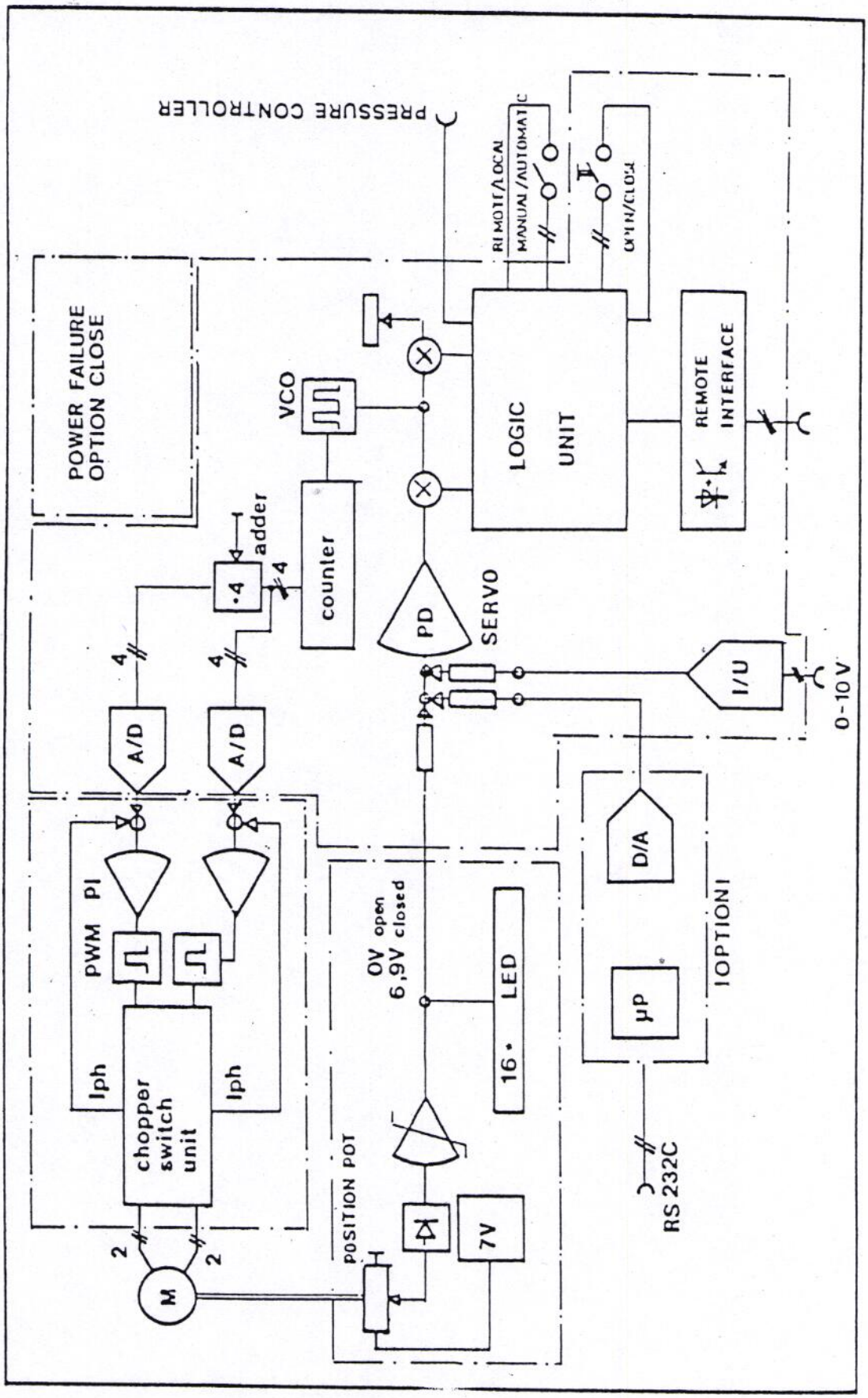
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für Vakuum-Apparate-Technik
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MASTER BOARD

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PRESSURE CONTROLLER
REMOTE/LOCAL
MANUAL/AUTOMATIC
OPEN/CLOSE
POWER FAILURE
OPTION CLOSE
VCO
LOGIC
UNIT
REMOTE
INTERFACE
adder
·4
counter
PD
SERVO
I/U
0-10 V
A/D
A/D
PWM PI
Iph
chopper
switch
unit
Iph
M
POSITION POT
0V open
6,9V closed
16 · LED
7V
D/A
µP
IOPTIONI
RS 232C

6. RS232C OPTION

This module is used as an interface between the valve controller and any computer with an interface conforming to the RS232C standard. A CMOS-microprocessor of the 6303 type is used for the central control functions between the interface and a digital/analog converter of the 9706 type. A "watch-dog-reset" circuit is used for reinitialization after a failure. A "trap-interrupt" circuit in the processor also trips out a reinitialization after an illegal OP-code.

Attention : Don't use pin 14 of the 25 pin CANNON connector for analog inputs if you are using the RS232C interface. This input is internally used by the RS232C.

6.1. THEORY OF OPERATION (also see item 6.3.)

The module has two functions; first to preset position references from a computer, and second, to feed back the actual position of the valve. The computer must transmit 2 bytes containing 5 bits of the 10 bit (binary) reference. Those 5 bits are located at the beginning of each data word (Q0-Q4). The following two bits (Q5, Q6) define the meaning of the data (high data byte, low data byte or request for feedback). The maximum value bit (Q7) of the data word decides the parity (even parity). Therefore, it's possible to get the actual valve position by sending out a request for feedback. The value 000 (hexadecimal, =0 decimal) means "fully open" and the value 3FF (hexadecimal = 1023 decimal).

6.2. SETTING OF THE BAUDRATE

Before putting the RS232C module into operation the baudrate has to be set by means of the jumper JA and the jumper JB. Look for the appropriate baudrate in the following table and set it on the RS232 board (see drawing of RS232C board).

BAUDRATE	JUMPER JA	JUMPER JB
150	off	off
600	on	off
4800	off	on
38400	on	on

Baudrate 38400 should only be used for exceptional cases. The module is set to 4800 baud at the plant.

6.3. TRANSMISSION FRAME

startbit	1	
stopbit	1	
databit	7	
paritybit	1	(even)

stopbit	Q7	Q6 Q5	Q4 Q3 Q2 Q1 Q0	startbit
	parity (even)	meaning	data	

According to RS232C standard the data will be transmitted in negative logic.

6.4. CONTROL WIRING

Normally the RS232C interface will be connected to the host computer by three wires (RXD, TXD, GND). The two wires RXD and TXD have to be crossed out in the connection case. Only connect shielding on to one side.

The two control wires RTS (pin 4) and DTR (pin 20) avoid the interlocking of a modem interface.

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6.5. EXAMPLE FOR PROGRAMMING

For EPSON HX20, test procedure for single position inputs and ramps.

```
2 REM--SERVO-VAT------
3 REM--INIT-----------
4 DIM B$(48)
5 F1$="ILL. BAUDR. !
6 F2$="ILL. WERT!
9 REM--MENUE----------
10 PRINT"____SERVO-VAT_
____"
20 PRINT"EINZELWERTE____
1"
30 PRINT"RAMPE_____
2"
35 PRINT"ABGLEICHEN____
3"
40 INPUT"WAEHLEN SIE:",M
E
45 IFME<1 OR ME>3 THEN G
OTO 10
50 IFME=1THEN GOTO 550
60 IF ME=2 THEN GOTO 290
70 IF ME=3 THEN GOTO 250
0
99 REM--EINGABE-------
100 PRINT"BAUDR.:150/600
/4800"
110 INPUT"=> ",  BR
120 IFBR<>150ANDBR<>600A
NDBR<>4800 THEN PRINT F1
$:GOTO100
125 RETURN
130 PRINT"SOLLW. MIN:  0-
1023"
140 INPUT"=> ",SN
150 IFSN<0 ORSN>1023 THE
N PRINT F2$:GOTO130
155 RETURN
160 PRINT"SOLLW. MAX:"STR
$(SN)"-1023"
170 INPUT"=> ",SX
180 IF SX<SN OR SX>1023
THEN PRINT F2$:GOTO160
185 RETURN
190 PRINT"SCHRITTW.:  ±
0-1023
200 INPUT"=> ",SR
210 IF ABS(SR)>1023 THEN
 PRINT F2$:GOTO190
215 RETURN
220 PRINT"DELAY:   0-100
000 MS
230 INPUT"=> ",DE
240 IFDE<0 OR DE>100000
THEN PRINT F2$:GOTO220
245 RETURN
250 PRINT"SOLLWERT   0-1
023"
260 INPUT"=> ",S
270 IFS<0 OR S>1023 THEN
 PRINT F2$:GOTO 250
275 RETURN
289 REM--RAMPE---------
290 GOSUB 100:GOSUB 130:
GOSUB 160 :GOSUB190:GOSU
B 220:GOSUB 1800
300 IF SR<0THEN L1=SX:L2
=SN ELSE L1=SN:L2=SX
305 GOSUB 1000
310 FOR S=L1 TOL2 STEP S
R
320 GOSUB 950:GOSUB 1096
370 GOSUB 1500
371 IF S>L1 THEN GOTO 38
0
372 D3=DE
374 DE=15000
375 GOSUB 1100
378 DE=D3
380 NEXT S
390 GOTO 310
549 REM--EINZELWERTE----
550 GOSUB 100:GOSUB 220:
GOSUB 1000
560 GOSUB 1800
600 GOSUB 250
630 GOSUB 950:GOSUB 1096
640 GOSUB 1500
650 GOTO 600
949 REM--WERTE GEN.-----
950 S1=S/32:S2=(S1-INT(S
1))*32+32
960 S3=INT(S1)+64
970 A$=CHR$(S3)+CHR$(S2)
980 RETURN
999 REM--CONF. RS-232 --
1000 IF BR=150 THEN GOTO
 1030
1010 IF BR=600 THEN GOTO
 1050
1020 IF BR=4800 THEN GOT
O 1070
1030 OPEN "O",#1,"COM0:(
17E1F)
1040 OPEN "I",#2,"COM0:(
17E1F)":GOTO 1090
1050 OPEN "O",#1,"COM0:(
37E1F)
1060 OPEN "I",#2,"COM0:(
37E1F)":GOTO 1090
1070 OPEN "O",#1,"COM0:(
67E1F)
1080 OPEN "I",#2,"COM0:(
67E1F)":GOTO 1090
1090 RETURN
1094 REM--OUTPUT-------
1096 PRINT#1,A$
1100 D1=INT(DE/5)
1110 FOR I=0TOD1:NEXT I
1120 PRINT#1,CHR$(96)
1140 RETURN
1499 REM--INPUT+AUSW.---
1500 FOR I=1TO48
1510 LINEINPUT#2,B$(I)
1520 IF EOF(2) THEN GOTO
 1550
1530 NEXT I
1550 FOR J=1TOI:C1=0:C2=
0
1560 FOR K=1TO LEN(B$(J)
)
1570 C=ASC(MID$(B$(J),K,
1))
1580 IF C<96 AND C>63 TH
EN C1=(C-64)*32:GOTO 163
0
1590 IF C<64 AND C>31 TH
EN C2=C-32:GOTO 1630
1600 IF C=96 THEN PRINT"
FRAMING ERR. !":LPRINT"FR
AMING ERR. !":GOTO 1660
1610 IF C=97 THEN PRINT"
PARITY ERR. !":LPRINT"PAR
ITY ERR. !":GOTO 1660
1620 IF C=98 THEN PRINT"
ILL. INSTR. ERR. !":LPRINT"
ILL. INSTR. ERR. !":GOTO166
0
1630 NEXT K
1635 IF ME=3 THEN PRINT
S  TAB(10) C1+C2:LPRINT
S TAB(7)"|"C1+C2 TAB(14)
"|" :GOTO1660
1640 PRINTS TAB(7) C1+C2
 TAB(15) S-(C1+C2)
1650 LPRINT S TAB(7) "|"
 C1+C2 TAB(14) "|" S-(C1
+C2)
1660 NEXT J
1670 RETURN
1799 REM--TABKOPF-------
1800 LPRINT:LPRINT:LPRIN
T
1802 LPRINT"_____
_____"
1805 LPRINT"EINGABEPARAM
ETER:"
1810 LPRINT"BAUDRATE  :"
BR
1820 LPRINT"DELAY     :"
DE
1830 IF ME=1 ORME=3 THEN
 GOTO 1860
1840 LPRINT"SOLLW. MIN. :"
SN
1850 LPRINT"SOLLW. MAX. :"
SX
1855 LPRINT"SCHRITTW.  :"
SR
1860 LPRINT
1870 LPRINT"SOLLW.  |ISTW
. |ABW."
1875 LPRINT"_____|_____
_____"
1880 RETURN
2499 REM--ABGLEICH-------
2500 PRINT"DRUECKEN SIE
 S FUER":PRINT"SOLLWERTA
ENDERUNGEN!"
2505 GOSUB 100:GOSUB 220
:GOSUB 1000:GOSUB1500
2510 GOSUB 250:GOSUB 950
:GOSUB 1096
2520 PRINT#1,A$
2530 D1=INT(DE/1.66)
2540 FOR I=0 TO D1:NEXTI
2550 PRINT#1,CHR$(96)
2560 FOR I=1TO D1:NEXT I
2570 GOSUB 1500
2580 T$=INKEY$
2590 IF T$="S"THEN GOTO
2510
2600 GOTO 2550
```

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6.6. INSTALLATION

If RS232C is installed later and not ordered with the valve controller.

6.6.1. Open the rear panel by loosening four screws.

6.6.2. Unsolder resistor RA from the masterboard. (see drawing of the masterboard for location)

6.6.3. Resolder resistor in poition RB

6.6.4. Connect the RS232C interface card to the main circuitboard. Be careful not to bend the contacts. Fix the circuitboard by tightening the screws.

6.6.5. Set the baudrate by means of the jumpers JA and JB. (see also item 6.2)

6.6.6. Close the valve controller.

6.7. TRANSMISSION MODE

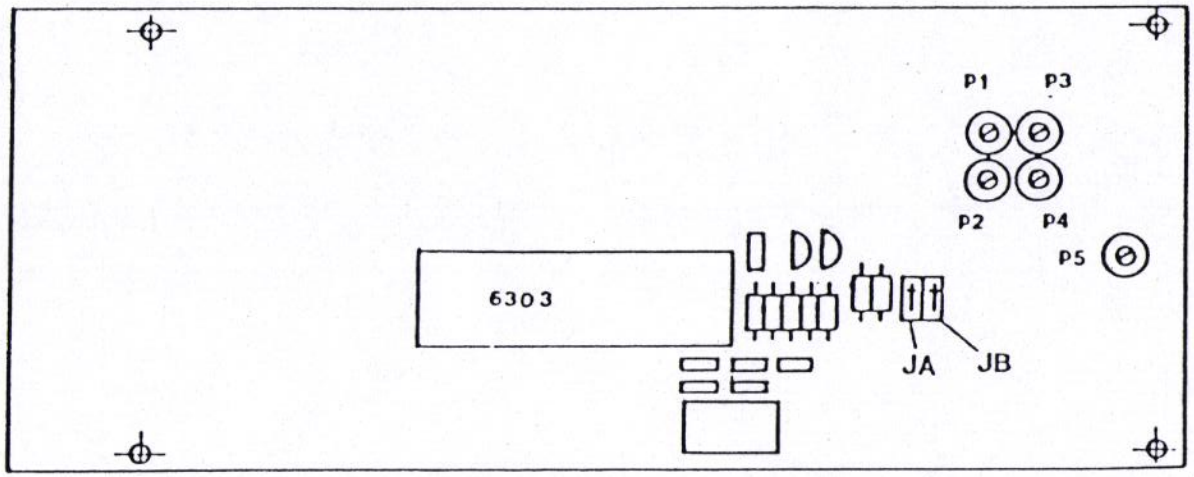
6.7.1. RECEPTION (VALVE CONTROLLER)

Q5	Q6	Meaning
1	0	Q0-Q4 receive the lower 5 bits of a new reference value
0	1	Q0-Q4 receive the higher 5 bits of a new reference value
1	1	request for position feedback
0	0	illegal

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CH-9469 Haag/SG, Schweiz



RS-232C BOARD

6.7.2. TRANSMISSION (VALVE CONTROLLER)

Attention: Following each transmitted word a carriage return is transmitted.

Q5	Q6	Meaning
1	0	Q0-Q4 receive the lower 5 bits of a new actual value
0	1	Q0-Q4 receive the higher 5 bits of a new actual value
1	1	error report (see following table)

6.7.3. ERROR REPORT (Q6=1, Q5=1)

Q0	Q1	Meaning
0	0	framing error
1	0	parity error
0	1	illegal request

The parity is even for reception and transmission. The conversion of an analog position signal into a digital signal is done by the method of successive approximation. The conversion time is apporximate 60ms. To change the higher 5 bits of the actual position signal only transmit the data word (including the 5 bits). It's not necessary to transmit both words.

7. POWER FAILURE OPTION

If an emergency operation is required an emergency power supply module is available on request. This module allows five successive emergency operations in a period of a few minutes. After that the Ni-Cd storage battery will have to be recharged for several days.

7.1 DEFINING OF THE SENSE OF THE EMERGENCY CLOSURE

The sense of the emergency closure is set via the jumper S2 at the main panel (see scheme of master board)

OFF (set at delivery) means closing of the valve; ON means opening of the valve in case of power failure.

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7.2. INSTALLATION

Mount and connect the module to the valve controller as shown in the drawing included.

7.3 TECHNICAL DATA

Nature of charge: permanent charging with a constant power source 10 mA

Accumulators: Ni-Cd sintered cells, consistent with permanent charging

Residual current after safety closures: about 0.5 mA

7.4 SPECIAL OPTION GROUP CUT-OFF

Should mains switch be installed for cutting-off or switching on respectively, a GROUP of Valve Controllers provided with a power failure closing option, the individual Valve Controller cannot distinguish cutting-off the main switch from a power failure. This means that actuating the main switch would trigger the closings.

To prevent this effect, a relay is installed in the emergency power supply allowing to deactivate it. The components required can be custom-made supplied.

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