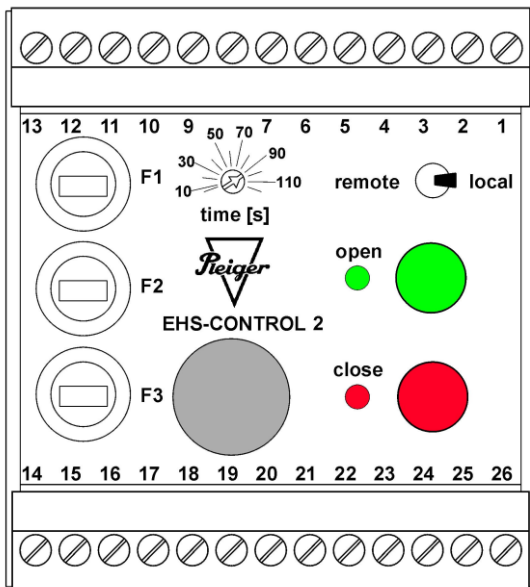


# EHS-CM2

Manual Version 2001-07

- subject to modification -



- **Operating instructions**
- **Functional description**
- **Assignment of terminals**
- **Technical specifications**
- **Principal wiring**

## Contents

<b>1</b>	<b>General information</b>	<b>1</b>
1.1	Transportation and storage instructions	1
1.2	Installation and electrical connection	1
1.3	Intervention into the component	1
1.4	Intended use	1
1.5	Not intended use	1
1.6	Use in safety related vital functions	1
1.7	Certificates and Approvals	2
<b>2</b>	<b>General description of the control module</b>	<b>3</b>
<b>3</b>	<b>Operating controls and display</b>	<b>4</b>
<b>4</b>	<b>Settings and adjustments</b>	<b>4</b>
4.1	Coding of the EHS type	4
4.2	Select Signalling Local / Remote or Alarm	5
4.3	Setting the running time (monitoring time / coasting time)	5
4.3.1	EHS-D, EHS-D/Q, EHS-S spring close	6
4.3.2	EHS-S spring open	6
4.3.3	EHS-S-Override	6
4.3.4	MOV	6
<b>5</b>	<b>Function of the module</b>	<b>7</b>
5.1	Post-start initialisation	7
5.1.1	EHS-D, EHS-D/Q, EHS_S, MOV	7
5.1.2	EHS-S-Override spring close	7
5.2	Local operation by means of the local bush buttons	7
5.2.1	Close EHS-D, EHS-D/Q	7
5.2.2	Close EHS-S spring close	7
5.2.3	Close EHS-S spring open	8
5.2.4	Close EHS-D, EHS-S spring close, intermediate mode (%)	8
5.2.5	Close EHS-S Override spring close	8
5.2.6	Close MOV	8
5.2.7	Open EHS-D, EHS-D/Q	8
5.2.8	Open EHS-S spring close	9
5.2.9	Open EHS-S spring open	9
5.2.10	Open EHS-D, EHS-S <i>intermediate mode</i> , (%)	9
5.2.11	Open EHS-S-Override spring close	9
5.2.12	Open MOV	9
5.3	Remote operation using external control-buttons to operate the actuator	10
5.4	Remote operation using a PLC to operate the actuator	10
5.4.1	All open / close actuators	10
5.4.2	EHS-D / S intermediate mode, (%)	10
5.5	Special mode: "consecutive close-down" [Dstep]	11
<b>6</b>	<b>Status and error messages</b>	<b>11</b>
<b>7</b>	<b>Acknowledging alarms</b>	<b>12</b>
<b>8</b>	<b>Assignment of terminals</b>	<b>13</b>
<b>9</b>	<b>Technical Specifications</b>	<b>15</b>

<b>10 Enclosures.....</b>	<b>15</b>
<b>10.1 Principle Wiring.....</b>	<b>15</b>

# 1 General information

This manual contains instructions and drawings for correct handling and using the equipment. Please observe all instructions of this manual carefully.

Please note that not respecting the information, using the equipment not according the regulations below, wrong installation or incorrect handling could influence personal or plant safety seriously!

This manual is part of this operation resource. Keep the manual safe for later use. The manufacturer reserves the right to change performance data, specification data or the design layout without an advance notice.

## 1.1 Transportation and storage instructions

The equipment must be inspected upon reception for damages that may have occurred during transportation or handling. If damages are obviously, inform the carrier and the manufacturer immediately. Dropped components must not be applied because invisible damages may influence the reliability.



## 1.2 Installation and electrical connection

The equipment has to be installed by qualified personnel only, that is familiar with the safety requirements and potential risk. Please note the special safety requirements belonging the point of installation, generally accepted rules of technology, the connection instruction in this manual and the available imprint on the component.



## 1.3 Intervention into the component

If malfunctions occur or something is dubious please contact the manufacturer. Intervention into the component could heavily affect the safety of person and plant and will lead to termination of liability and caveat emptor.

## 1.4 Intended use

To use the equipment is approved only if the instructions of this manual are complied and the use is appropriate to the type label and to an application it is intended to.

In the field the technical specifications and denoted limit values have to be generally maintained. This applies particular with regard to voltage, temperature and other noted environmental conditions. The use beyond the specified and approved edge conditions could put life at risk, damage the component or cause secondary damages to the plant.

## 1.5 Not intended use

Every use of the component that is not equal to the use described in chapter „1.4 intended use“ is obtained as not intended use. Damages that result from not intended use and / or result from unauthorised intervention on the component, not according to this manual, or not using original spare parts the claim for warranty and liability of the manufacturer expires.

## 1.6 Use in safety related vital functions

It is the responsibility of the user to perform a risk analysis of the whole installation and to define potential safety related functions.

It is the responsibility of the user to take care of appropriate measures to achieve the safeness in safety related vital functions.

## 1.7 Certificates and Approvals

PCM-modules meet the requirements of the following Directives:

- Directive 2014/90/EU on marine equipment
- DNV GL Guidelines VI-7-2



The following approvals apply:

- Type approval 26 092 – 05 HH by DNV GL

Certificates and approvals can be downloaded from our website or ordered from the manufacturer.



### Technical Support:

**+49 2324 398 333**

**service@pleiger-elektronik.de**

## 2 General description of the control module

The EHS control module has been designed and developed by Pleiger GmbH for controlling third-generation actuators that are without integrated control logic. It serves as interface for conventional remote control by means of external push buttons as well as for the control by means of a programmable logic control (PLC). Furthermore the module is equipped with an integrated backup function, so that the actuator can be directly controlled via the control module.

The module is fitted in a Phoenix electronic equipment case for top hat rail mounting. The equipment has a width of 67.5 mm, a height of 75 mm and a depth of 107.5 mm from mounting surface.

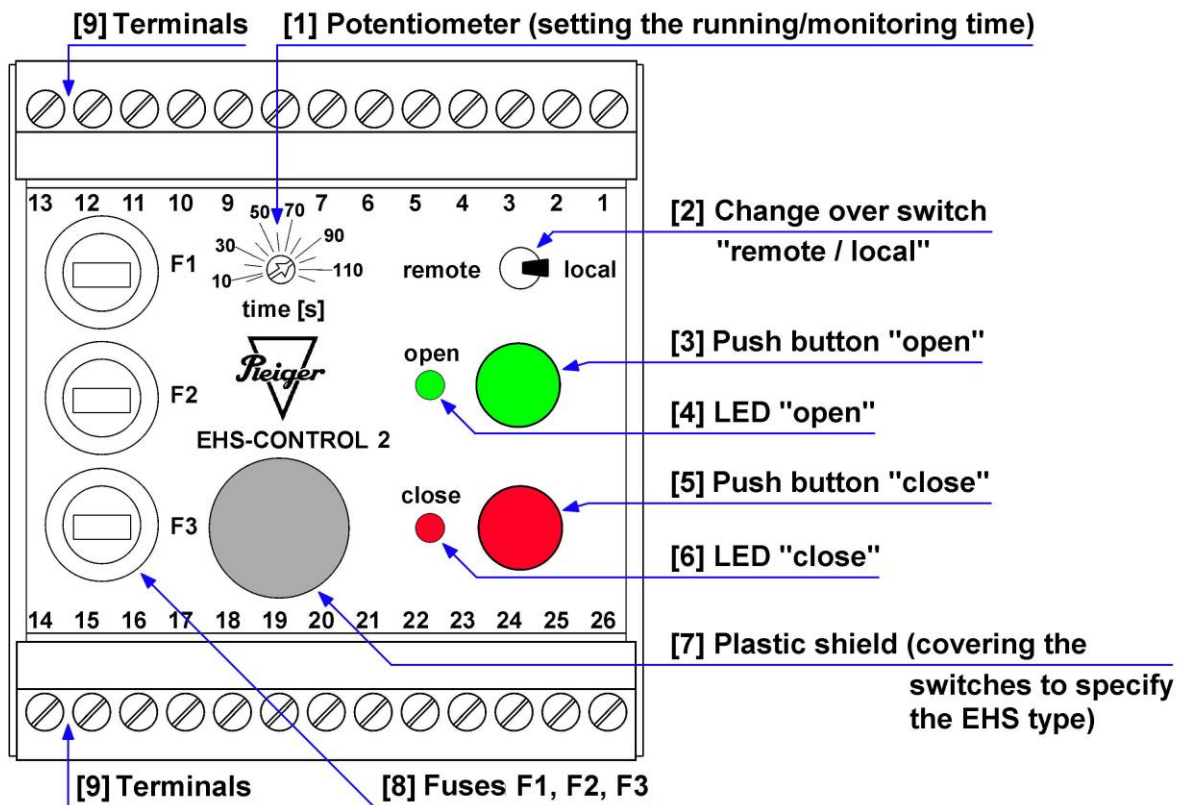


Figure 1: Front view of control module EHS-CM2

A separate module is required for each actuator. There are two terminal strips each with 13 contacts for connecting the EHS.

### 3 Operating controls and display

The control module includes all the operating controls that are required to control the actuator. These controls include a separate button for opening [3] and closing [5], as well as a switch [2] for changing between internal (local) and external (remote) setting of the operating mode.

The equipment also includes a potentiometer [1] that can be adjusted with a small screwdriver to set the maximum permissible running time (monitoring time) for the actuator. The range of settings for the running time is 4 ..120s (240s).

Four sliding mini-switches [7] are used for setting the controls. The four switches are accessible from the front of the case and normally covered with a plastic shield.

In addition there are three fuses [8] accessible through the front of the case that protect the two phases of the 230V AC (F1, F2 = 3,15 A) electricity supply and of the +24V (F3 = 0,5 A) supply.

The drive direction, the position and the warnings are indicated by the two LED “open” [4] and “close” [6].

### 4 Settings and adjustments

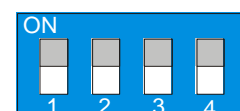
Before putting in operation the following settings and adjustments must be made.

#### 4.1 Coding of the EHS type

For coding the EHS type that is going to be controlled, the plastic shield covering the four mini-switches has to be removed. The different settings for coding are shown in table 1.

Actuator Type	Mode of Operation	Run Time	Position of Switches			
			1	2	3	4
1 EHS-D EHS-D/Q double acting	open / close	4s..240s	ON	ON	OFF	X
2 EHS-S single acting, spring close	open / close	4s..120s	OFF	ON	OFF	X
3 EHS-D double acting	%	4s..240s	ON	OFF	OFF	X
4 EHS-D double acting	open / step close	4s..120s	OFF	OFF	OFF	X
5 EHS-S single acting, spring open	open / close	4s..120s	ON	ON	ON	X
6 EHS-S-override, spring close	open / close	4s..120s	OFF	ON	ON	X
7 MOV motor valve	open / close	Infinite	ON	OFF	ON	X
8 EHS-S single acting, spring close	%	4s..120s	OFF	OFF	ON	X

Table 1: Settings of the mini-switches [7]



Actuator types:

- EHS-D: double acting rotary actuator  
 EHS-D/Q: double acting linear or rotary actuator with separate hydraulic unit  
 EHS-S: single acting linear or rotary actuator, spring open or spring close  
 MOV motor valve  
 EHS-S override single acting, spring close + manual open

Mode of Operation

- open / close actuator stops in open or close position  
 % intermediate actuator stops in any position when the command button is released  
 open / step close actuator is closing stepwise to slow down closing speed

**NOTE:** Any setting of the mini switches has no effect until the controller is started, that means is switched off and then turned on again.

**ATTENTION:** A false coding of the slide switches may cause a damage of the controller or the actuator!

## 4.2 Select Signalising Local / Remote or Alarm

The relay contact (terminal 10, 11) is either used to signalise the alarm state of the module or it is used to signalise the position of the local / remote switch [2]. The selection is done by means of the mini switch no. 4.

- Position OFF signalising alarms (like timeout)  
 contact closed = no alarm, contact open = alarm
- Position ON signalising the position of the local / remote switch  
 Contact close = remote, contact open = local  
**Additionally the mimic diagram inputs 22 and 23 are active even in local mode.  
 Of course input 19 must be low when using these inputs.**

## 4.3 Setting the running time (monitoring time / coasting time)

The time scale of the potentiometer [1] is correct for drives with a max. run time of 120 s. For those drives with a maximum run time of 240 s the adjusted time is twice the scale value.



### 4.3.1 EHS-D, EHS-D/Q, EHS-S spring close

The auxiliary function incorporated into the equipment will be of considerable help in setting the appropriate running time. First set the controller to "local" mode and the running time (potentiometer [1]) to 120 (240) s. Then run the actuator from the "closed" to the "open" position.

After the final position has been reached and the reading is "open" (the LED remains on), the running time can be adjusted. This is done simply by pressing "open" button [3] once more. The LED [4] indicating "open" will start to flash on and off. While adjusting the potentiometer keep the open button pressed.

Now reduce the running time by turning the potentiometer [1] counter clockwise until the LED [4] denoting „open“ stops flashing, i.e. is off permanently. In this way both the running time and the monitoring time have been adjusted correctly.

The monitoring time is calculated using the formula given below on the basis of the running time:

$$\text{monitoring time} = 6\text{s} + 115\% \text{ running time}$$

The coasting time is essential so that the actuator will not come to a standstill on reaching the "close" status, until the valve has been pressed firmly against the seal. The time required will thus also depend on the running time of the actuator itself. The coasting time is calculated using the formula given below on the basis of the running time:

$$\text{coasting time} = 1\text{s} + 2,5\% \text{ running time}$$

**Note:** *An incorrectly adjusted running time may cause malfunction!*

### 4.3.2 EHS-S spring open

Drive the actuator into the open position by pressing the open button [3] and close it again by pressing the close button [5]. After reaching the close position press the close button [5] again and keep it pressed. LED [6] starts blinking. Now turn the potentiometer [1] counter clockwise until the LED stops blinking. The running time is adjusted correctly now.

### 4.3.3 EHS-S-Override

The adjusting is done in the same way as described for EHS-D. For further operation two different monitoring times are calculated:

$$\text{monitoring time}_A = 125\% \text{ of the running time} + 6\text{s}$$

$$\text{monitoring time}_B = 10\% \text{ of the running time} + 2\text{s}$$

The use of these times is described in next chapter.

### 4.3.4 MOV

In case of a motor valve no adjustment of the running time is necessary.

## 5 Function of the module

### 5.1 Post-start initialisation

After the module has been switched on, the type of EHS specified by means of the slide switches [7] is determined and used for the control algorithm as long as the controller is not reset again.

#### 5.1.1 EHS-D, EHS-D/Q, EHS\_S, MOV

Next, the command cycle is determined on the basis of the actuator's current setting.

Once the final position is on "open", the command cycle will be set to "open". Once the final position is on "closed", the command cycle will revert to "close".

If no final position is detected after 3 seconds, the alarm contact will open, and the two LEDs will flash twice per second. To reset the alarm the actuator must be driven into the open or closed position (button [3] or [5]).

#### 5.1.2 EHS-S-Override spring close

After reset the command cycle is always "close". If the final position "closed" is reached LED [6] is on permanently and LED [4] is off.

If the close position is not reached, the LED [6] signals "override function" by blinking very slowly (once every 2 s). If additionally the final position open is reached the LED [4] "open" is turned on permanently. If not the LED is blinking once a second.

## 5.2 Local operation by means of the local bush buttons

When the switch [2] on the control module is on "local", the actuator is activated by using the two "local" buttons. The inputs marked 17, 18, 19, 22, 23 are ignored as long as mini switch no 4 is in position OFF.

### 5.2.1 Close EHS-D, EHS-D/Q

The command cycle is set on "close" by pressing "close" [5] once. The actuator will start, the LED [6] will flash once per second. As soon as the final position is on "closed", the LED [6] will glow without flashing. At the end of the coasting time the actuator is switched off automatically. When the final position is not reached before the pre-set monitoring time has run down, the actuator is switched off, the LED indicating "close" will flash twice per second and the alarm contact will open.

If, for some reason, the final position "closed" should be left, the closing procedure will commence again.

### 5.2.2 Close EHS-S spring close

The command cycle is set on "close" by pressing "close" [5] once. The solenoid valve  $Y_0$  becomes deenergized, i.e. opens and the LED [6] will flash once per second. As soon as the final position is on "closed", the LED [6] will glow without flashing.  $Y_0$  remains deenergized, i.e. open. When the final position is not reached before the pre-set monitoring time has run down, the actuator is switched off (EHS-S:  $Y_0$  will remain deenergized), the LED indicating "close" will flash twice per second and the alarm contact will open.

### 5.2.3 Close EHS-S spring open

The command cycle is set on “close” by pressing “close” [5] once. The pump is started and the LED [6] will flash once per second. After a delay of 150ms the valve  $Y_0$  is close. In this way the pump will operate pressure-free as it is started. As soon as the final position is on “closed”, the LED [6] will glow without flashing. If the close position is not reached within the monitoring time an alarm is released and the valve  $Y_0$  is opened to open the actuator again. If the final position “close” is left for some reason, the “close” procedure will re-commence.

### 5.2.4 Close EHS-D, EHS-S spring close, intermediate mode (%)

Closing will only continue as long as the button [5] is pressed down. Monitoring time will re-commence each time the button [5] is released and pressed again. Whatever the procedure, after the final position has been reached and the coasting time passed, the actuator will switch off. The display functions of the LED [6] are exactly the same as those for the EHS-D.

### 5.2.5 Close EHS-S Override spring close

The way the actuator is closed depends on the way it was opened before. It may either be opened by the hydraulic system or manually or the hydraulic function was interrupted and not completed.

- Closing after the valve was opened properly by the hydraulic system  
The solenoid valve is opened and the monitoring time is started. If the closed position is not reached after the monitoring time<sub>A</sub> has passed an alarm is released.
- Closing after the valve was opened manually (override)  
First the drive is started in open direction for a time period = monitoring time<sub>A</sub>. The valve is closed 150 ms after starting the pump. When the time period is over the actuator must have reached the open position.  
If the open position is not reached after this period an alarm is released and the valve is opened to close the actuator. In this case the actuator may not be closed completely (it is not certain). The red LED is blinking twice a second.  
If the open position is reached the valve is opened to close the actuator. The monitoring time is started again. If the close position is not reached after the monitoring time<sub>A</sub> has passed an alarm is released.
- Closing after the valve was opened and an alarm was raised  
In this case the same procedure as described above is used.

### 5.2.6 Close MOV

When the close button [5] is pressed the valve motor is started in close direction while the red LED [6] is blinking once a second. As soon as the final position is reached the red LED turns on permanently. The motor is never turned off by the module but by the valve itself. There is no monitoring time used.

### 5.2.7 Open EHS-D, EHS-D/Q

Pressing the „open“ button [3] once starts the command cycle. The actuator will start while the LED [4] is flashing once per second. As soon as the final position “open” has been reached, the actuator will switch off and the LED [4] will turn on permanently. If the final position has not been reached, though the monitoring time that has been specified has run down, the actuator will stop running, the LED [4] “open” will flash twice per second and the alarm contact will open. If the final position “open” is left for any reason, the opening procedure will re-commence.

### 5.2.8 Open EHS-S spring close

In addition to the functions described above for the EHS-D, as soon as the pump actuator is started, valve  $Y_0$  that is required for closing, will be deenergized (i.e. will open) for approximately 150 ms. In this way the pump will operate pressure-free as it is started. If the open position is not reached within the monitoring time an alarm is released and the valve  $Y_0$  is opened to close the actuator again. The display functions of the LED [4] are exactly the same as those for the EHS-D. If the final position "open" is left for some reason, the "open" procedure will re-commence.

### 5.2.9 Open EHS-S spring open

The command cycle is set on "open" by pressing "open" [3] once. The solenoid valve  $Y_0$  becomes deenergized, i.e. opens and the LED [4] will flash once per second. As soon as the final position is on "open", the LED [4] will glow without flashing.  $Y_0$  remains deenergized, i.e. open. When the final position is not reached before the pre-set monitoring time has run down, the actuator is switched off (EHS-S:  $Y_0$  will remain deenergized), the LED indicating "open" will flash twice per second and the alarm contact will open.

### 5.2.10 Open EHS-D, EHS-S *intermediate mode*, (%)

The opening procedure will operate only while the button [5] is kept pressed down. The monitoring time will re-commence each time the button [5] is pressed. The actuator will always switch off on reaching the final position.

### 5.2.11 Open EHS-S-Override spring close

a) by using hydraulically system

In addition to the functions described above for the EHS-D, as soon as the pump actuator is started, valve  $Y_0$  that is required for closing, will be deenergized (i.e. will open) for approximately 150 ms. In this way the pump will operate pressure-free as it is started. Disregarding the limit switch "open" the pump will run the complete monitoring time<sub>A</sub>. If the open position is not reached now an alarm is released and the valve  $Y_0$  is opened to close the actuator again. The display functions of the LED [4] are exactly the same as those for the EHS-D. If the final position "open" is left for some reason, the "open" procedure will re-commence using the monitoring time<sub>B</sub>.

a) by using the hand wheel

If the valve is closed ( LED[6] "close" is on) it can be opened manually by means of the hand wheel. When the closed position is left the LED[6] "closed" signalises the override function by blinking very slowly ( once every two seconds).

As long as the open position is not reached the LED[4] "open" is blinking once a second. It turns on permanently as soon as the open position is reached. There is no time monitoring.

### 5.2.12 Open MOV

When the open button [3] is pressed the valve motor is started in open direction while the green LED [4] is blinking once a second. As soon as the final position is reached the green LED turns on permanently. The motor is never turned off by the module but by the valve itself. There is no monitoring time used.

### 5.3 Remote operation using external control-buttons to operate the actuator

When the changeover switch [2] on the control module is set on “remote” and when the input 19 “automatic/manual” is not switched on (open, 0V), the actuator will be controlled via inputs 22 and 23. The function of input 23 is the same as that of the “close” button [5], and input 22 has the same function as the “open” button [3]. Outputs 24 and 25 will always display the same signals as LED “open” and “close”.

### 5.4 Remote operation using a PLC to operate the actuator

When the changeover switch [2] on the control module is set on “remote” and the input 19 “automatic/manual” is set on “automatic” (24V), the actuator will be controlled via inputs 17 and 18. Outputs 20 and 21 always indicate the position of the EHS limit switch.

In the case that the automatic operation is to be controlled by means of a PLC-program, a defined input signal for the control direction must be set (terminal No. 17) before the input automatic/manual input becomes high and the automatic operation starts (terminal No. 19 = 24V).

**Note: if input 19 is low the inputs 17 and 18 are ignored**

#### 5.4.1 All open / close actuators

A 24V voltage at input 17 indicates the “open” command cycle. When input 17 is not wired, or switched to 0V, this will indicate the “close” command cycle. Input 18 is not used.

In case of failure of the PLC control voltage, i.e. the two inputs 17 and 19 will be deenergized at the same time (0V), the instruction direction entered last, before voltage failure, remains stored.

In case of failure of 24V supply voltage of the control module EHS-CM, the drives EHS-D and EHS-D/Q stop, the drive EHS-S drives into its drive-specific preferred direction.

#### 5.4.2 EHS-D / S intermediate mode, (%)

The inputs 17 and 18 operate in a similar way like the “open” and “close” buttons [3][5].

## 5.5 Special mode: “consecutive close-down” [Dstep]

This function can be used to decelerate the closedown of an EHS-D. In a situation of this kind the assumption is made that the running time is correctly specified in the manner described under the heading *Setting a running time*. The closedown will be in 7 steps.

Step	Time with running time of 10s	Time with running time of 100s
Closed approx. 30°	6,6s	66s
Pause 0.22* op. time	2,2s	22s
Closed approx. 20°	1,1s	11s
Pause 0.22* op. time	2,2s	22s
Closed approx. 10°	1,1s	11s
Pause 0.22* op. time	2,2s	22s
Closed 0°	1,1s	11s
Overall Time	16,5s	165s

Table 2: Close and pause times, with a running time of 10 and 100 seconds, relating to a swivel angle of 90°.

The opening process is not touched of it. For the use of this special function, is by means of the miniature slide switches [7], as propulsion type Dstep to select (s. *Coding of the EHS type*).

## 6 Status and error messages

Assuming that the “close” LED [6] is **off**, the “open” LED [4] will emit the following signals:

- **Permanently on** (+24V), as long as the valve is completely open.
- **Flashing slowly** (once per sec.), as long as the valve is opening.
- **Flashing quickly** (twice per sec.), when the actuator fails to attain the final position within the monitoring time.

Assuming that the “open” LED [4] is **off**, the “close” LED [6] emit the following signals:

- **Permanently on** (+24V), as long as the valve is completely closed.
- **Flashing slowly** (once per sec.), as long as the valve is closing.
- **Flashing quickly** (twice per sec.), when the actuator fails to attain the final position within the monitoring time.

Both, the “close” LED [6] and the “open” LED [4] will emit the following signals:

- **Flashing quickly** (twice per sec.), when a switch-on fails to generate a command cycle from the actuator at its present setting.
- **Flashing quickly** (four times per sec.), when the two messages “opened” and “closed” are simultaneous.

### **EHS-S-Override only**

The red LED [6] signalises the override function by blinking very slowly ( once every two seconds). The green LED [4] shows the signals:

- **On permanently**, as long as the actuator is open completely
- **Blinking slowly**, (once per second) as long as the actuator is opening

These status and error messages are simultaneously available via the indication outputs (terminal No. 24 ↔ LED “open” / terminal No. 25 ↔ LED “close”). LED “on” corresponds here to a potential of 24 V, LED “off ” corresponds to a potential of 0 V at the respective terminal.

## **7 Acknowledging alarms**

Any alarm is acknowledged by entering a command: the alarm contact will close and the monitoring time will be reset.

If a PLC is used to control the valves a single input is used to control the actuator. In this case the state of the command input must be changed for at least 200 ms in order to reset the alarm.

Example: If an alarm occurs while opening the valve the command input must be set to “close” for at least 200 ms and then set to “open “ again. The alarm is reset and the opening continues until the actuator is open completely or another alarm occurs.

## 8 Assignment of terminals

All the connections are by means of screw terminals. The maximum permitted cable cross-section is 2,5 mm<sup>2</sup>.

Inputs		
No	Description	Specifications
13	L1, power supply	230V AC $\pm 20\%$ , max. 3,15A
12	L2, power supply	230V AC $\pm 20\%$ , max. 3,15A
3	EHS stop switch "open"	switching to ground, 5mA
2	EHS stop switch "closed"	switching to ground, 5mA
1	EHS continuous feedback	4..20mA
23	Ext. command, close	24V
22	Ext. command, open	24V
* 9	Lamptest (for the outputs "open/closed" to ext. display)	24V
19	PLC, automatic/ manual (24V = automatic control)	24V, opto-decoupled
18	PLC, command, close (only intermediate mode, EHS %)	24V, opto-decoupled
17	PLC, command, open/close (24V = open)	24V, opto-decoupled
16	PLC, 0V	0V
15	Power supply	+24V $\pm 20\%$ , max. 0,5A
14	Power supply	0V

The switching threshold of all the binary inputs is 12V  $\pm 6V$  at 2mA  $\pm 1mA$ . The input voltage is 0.. 30V.

\* with effect from Ser.No. 3361.



<b>Outputs</b>		
No	Description	Specifications
8	N, Shared contact, EHS actuator	230V AC, max. 3,15A
7	L, open, EHS actuator	230V AC, max. 3,15A
6	L, close, EHS actuator	230V AC, max. 3,15A
5	EHS supply voltage, 0V	*
4	EHS supply voltage, 24V	*
26	Ext. display, continuous position	4..20mA
25	Ext. display, EHS closed	24V, short-circuit proof *
24	Ext. display, EHS open	24V, short-circuit proof *
21	PLC, EHS closed	24V, short-circuit proof *
20	PLC, EHS open	24V, short-circuit proof *

<b>Relay contact (pot. free)</b>		
No	Description	Specifications
11	Alarm contact (normal closed)	0.5A / 125V AC
10	Alarm contact (normal closed)	0.5A / 125V AC

\* The current-consumption of all external modules, which are supplied via the EHS-CM module, may not exceed 400mA at all.

## 9 Technical Specifications

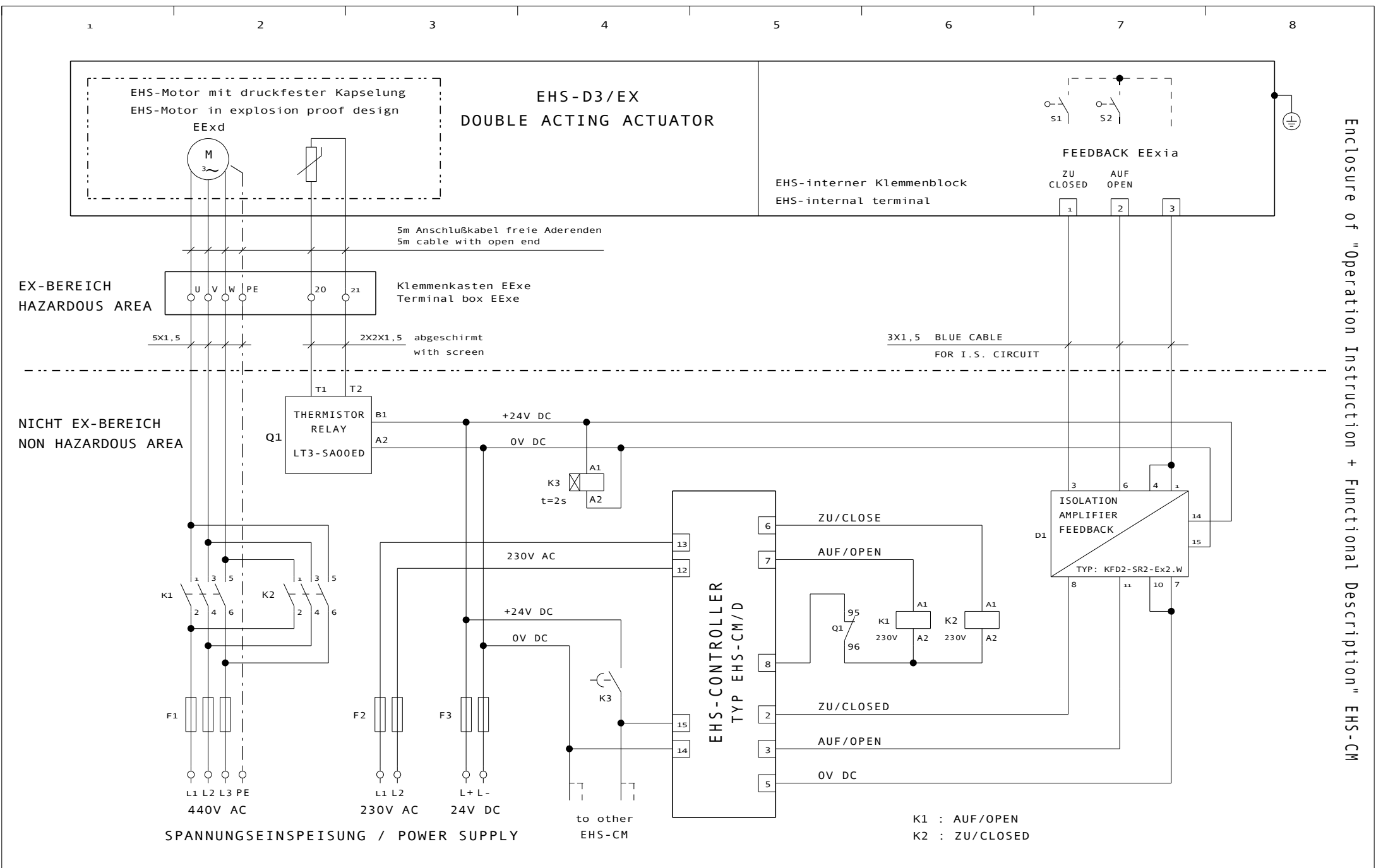
Case dimensions W x H x D (mm):	67,5 x 107,5 x 75	
Consumption:	< 100 mA	
Voltage:	24 VDC +/- 20%	230 VAC +/- 20%
Fuses:	0,5 AT	3,15 AT
Temperature range:	0... 70° C	
Installation:	No limit	
Type of protection:	IP20	

Power consumption depending on operation mode in mA, measured values +/- 10%:

Antrieb	closed	open	closing	opening
EHS-S with mechanical limit switches	61	82	max. 50	max. 85
EHS-D with electronic limit switches (OC3)	72	77	max. 80	max. 85

## 10 Enclosures

### 10.1 Principle Wiring



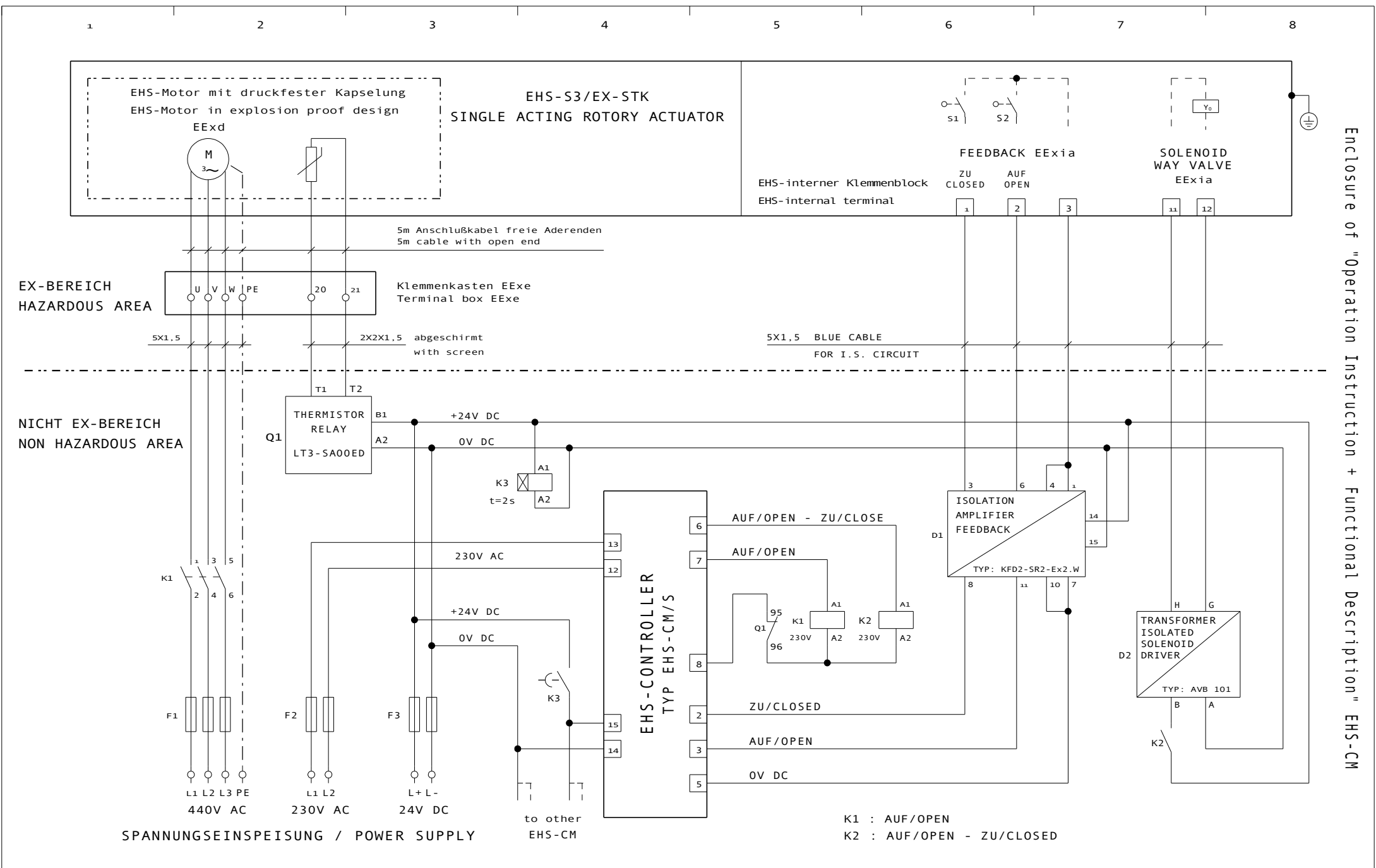
Enclosure of "Operation Instruction + Functional Description" EHS-CM

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name
a Type / connectors	02.12.98	Sch.	24.11.98	Schuster
b Q1 / D1	04.05.99	Sch.		
c EHS-CM / FEEDBACK	09.12.99	Sch.		
d K3 / FEEDBACK	28.01.00	Sch.		

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DESIGNATION/Bezeichnung	EHS-D3-EX // 440V AC
PROJECT/Projektbezeichnung	PRINCIPAL WIRING

DRWG. NO./Zeichn.-Nr.:	EHS-3	LOCATION/Ort:	PLANT/Anlage:
ORDER/Auftrag:		PAGE/Bl.:	10



Enclosure of "Operation Instruction + Functional Description" EHS-CM

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name
d EHS-CM / FEEDBACK	09.12.99	Sch.	24.11.98	Schuster
e K3 / FEEDBACK	28.01.00	Sch.		
f				
g				



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DESIGNATION/Bezeichnung  
**EHS-S3-EX / STK // 440V AC**

PROJECT/Projektbezeichnung  
**PRINCIPAL WIRING**

DRWG.NO./Zeichn.-Nr.: **EHS-3**

LOCATION/Ort:

PLANT/Anlage:

ORDER/Auftrag:

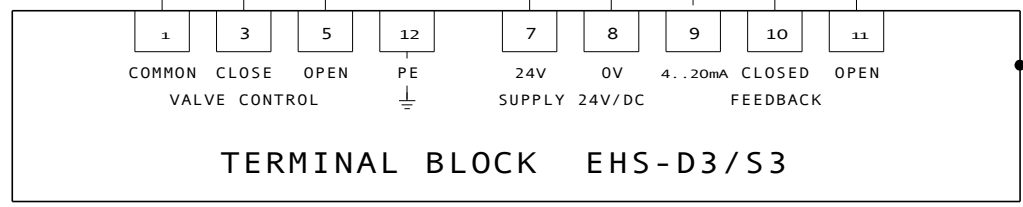
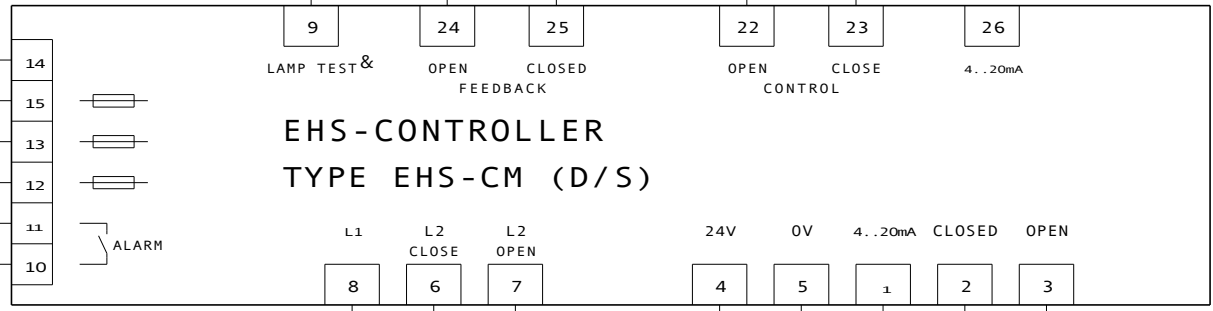
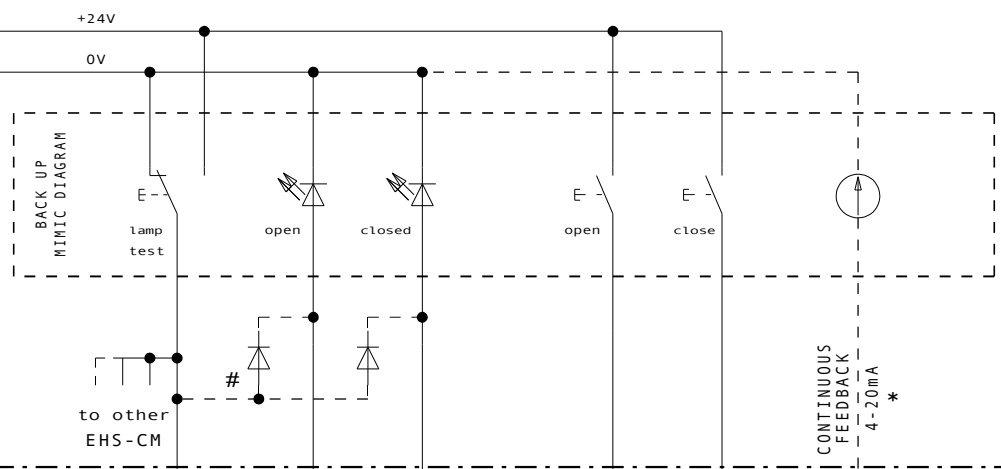
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**MANUAL CONTROL**

**CONTROL INTERFACE**

**LOCAL VALVE SIDE**



& = only ser. no. 3361 and higher  
 # = only ser. no. 3360 and lower

\* only for EHS-D3 (%)  
 in intermediate operation

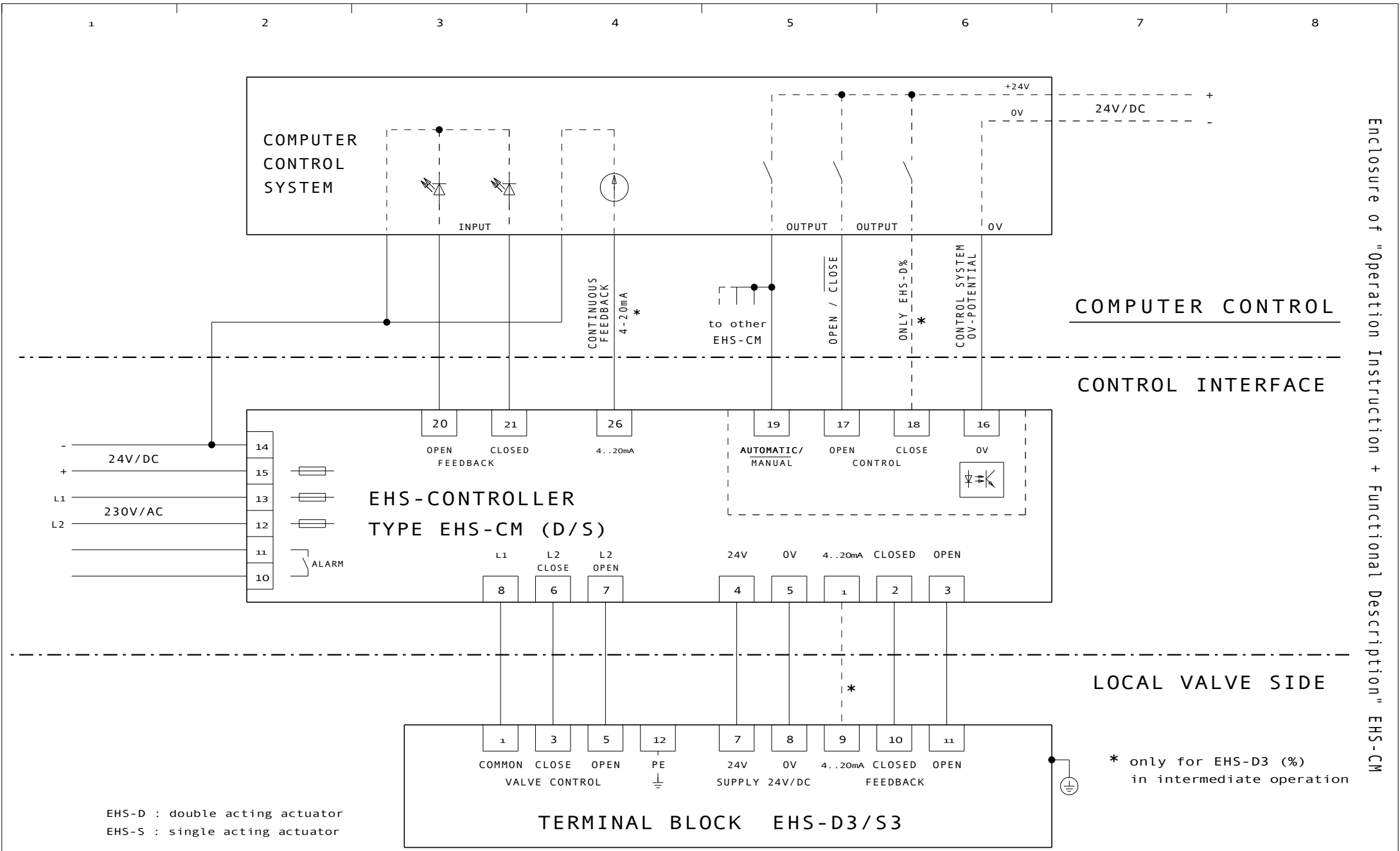
EHS-D : double acting actuator  
 EHS-S : single acting actuator

REVISION/Änderung	DATE/Datum	NAME/Name	DRAWN	DATE/Datum	NAME/Name	DESIGNATION/Bezeichnung	DRWG. NO./Zeichn.-Nr.:	LOCATION/Ort:	PLANT/Anlage:
a	01.12.98	Sch.	gez.	24.11.98	Schuster	MANUAL CONTROL	EHS-3		
b	16.03.99	Sch.				PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl: 3
c	15.12.99	Sch.	APPROVED			PRINCIPAL WIRING			10
d	28.01.00	Sch.	REP.						



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MANUAL CONTROL  
 EHS-3  
 PRINCIPAL WIRING



EHS-D : double acting actuator  
 EHS-S : single acting actuator

Enclosure of "Operation Instruction + Functional Description" EHS-CM

COMPUTER CONTROL


CONTROL INTERFACE

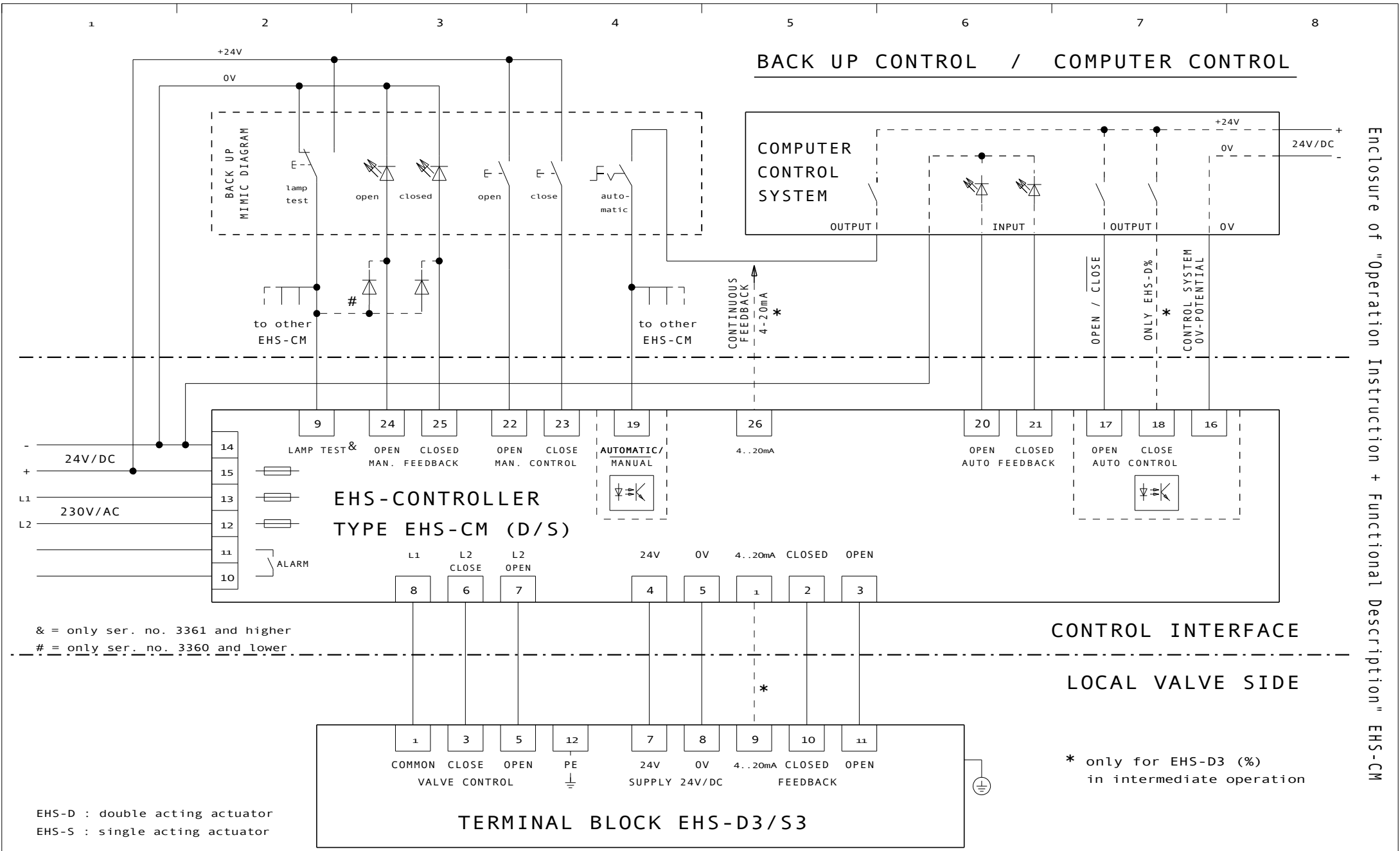
LOCAL VALVE SIDE

\* only for EHS-D3 (%)  
 in intermediate operation

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name	DESIGNATION/Bezeichnung	DRWG. NO./Zeichn.-Nr.:	LOCATION/Ort:	PLANT/Anlage:
d	15.12.99	Sch.	24.11.98	Schuster	COMPUTER CONTROL	EHS-3		
e	28.01.00	Sch.			PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl.: 4
f					PRINCIPAL WIRING			10
g								

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**CONTROL INTERFACE**

**LOCAL VALVE SIDE**

\* only for EHS-D3 (%)  
 in intermediate operation

EHS-D : double acting actuator  
 EHS-S : single acting actuator

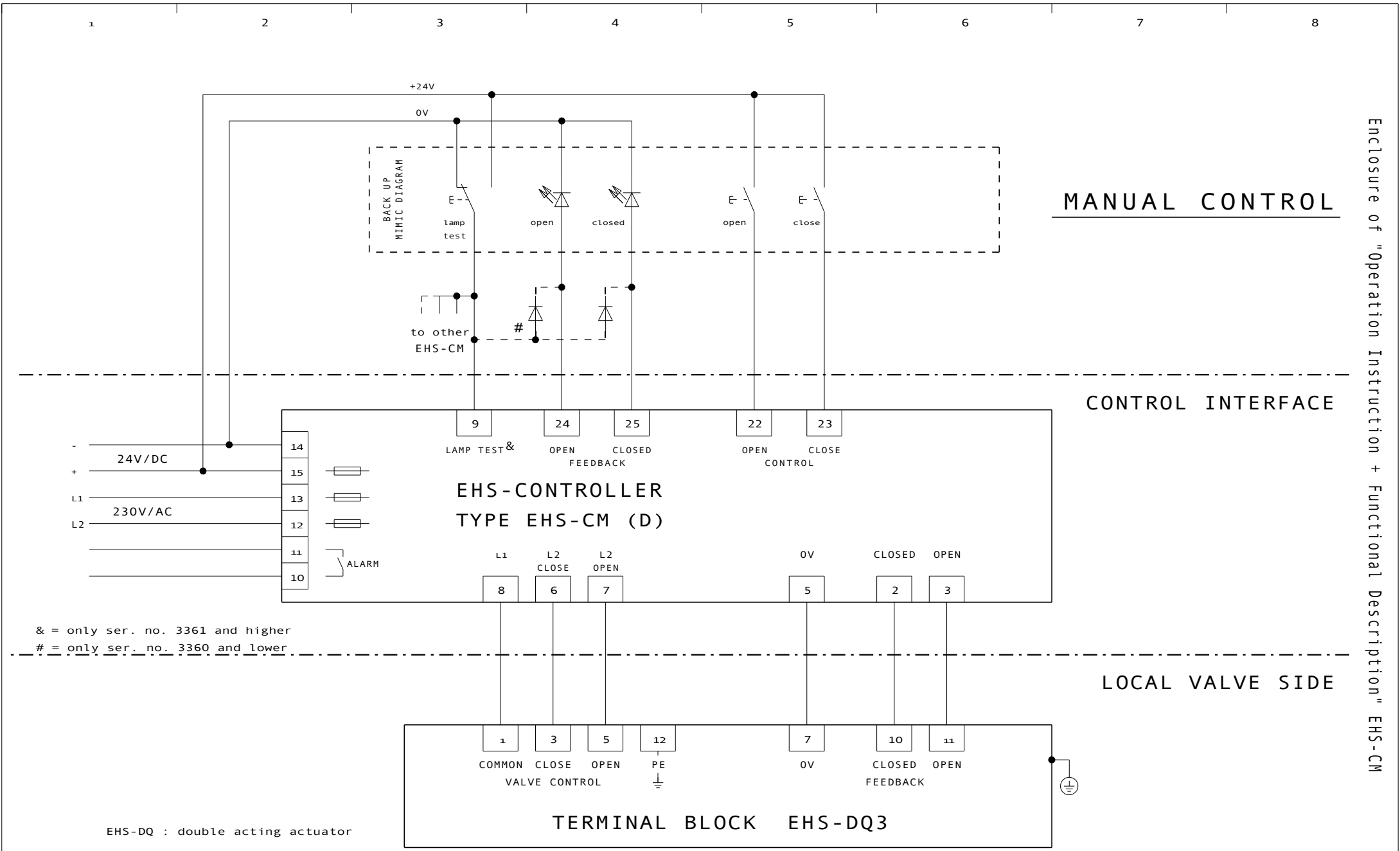
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a	01.12.98	Sch.	24.11.98	Schuster	BACK UP / COMPUTER CONTROL	EHS-3		
b	16.03.99	Sch.			PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl.: 5
c	15.12.99	Sch.			PRINCIPAL WIRING			10
d	28.01.00	Sch.						



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DESIGNATION/Bezeichnung: **BACK UP / COMPUTER CONTROL**  
 DRWG. NO./Zeichn.-Nr.: **EHS-3**  
 PROJECT/Projektbezeichnung: **PRINCIPAL WIRING**  
 LOCATION/Ort: **EHS-3**  
 ORDER/Auftrag: **EHS-3**  
 PLANT/Anlage: **EHS-3**  
 PAGE/Bl.: **5**  
 10

Enclosure of "Operation Instruction + Functional Description" EHS-CM



Enclosure of "Operation Instruction + Functional Description" EHS-CM

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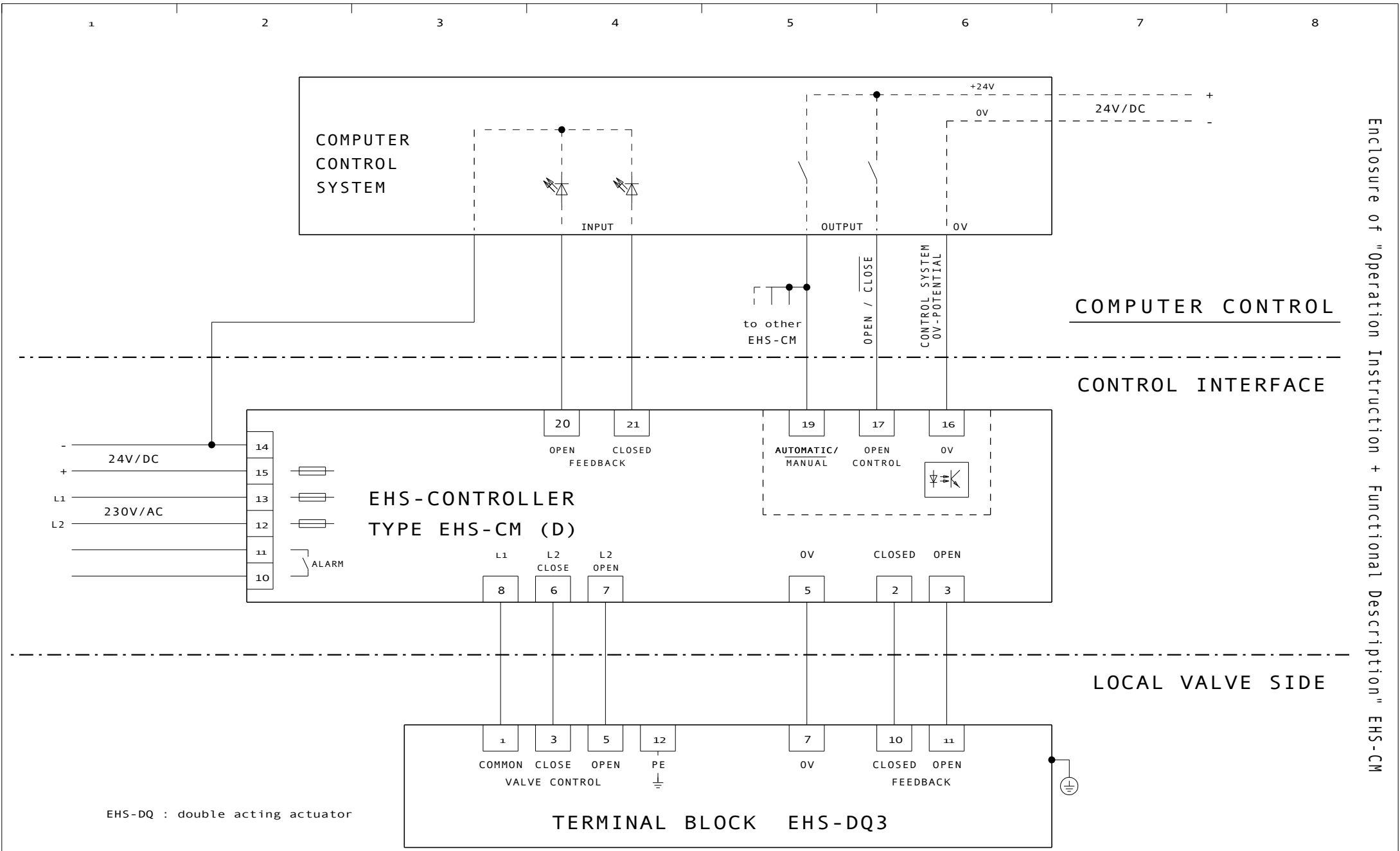
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a	POTENTIAL CONNECTION	17.09.99	Sch.	DRAWN	MANUAL CONTROL	EHS-3		
b	EHS/DQ3 TERMINAL 7 - 0V	09.12.99	Sch.	gez.				
c	SER. NO. / LAMP TEST	28.01.00	Sch.	APPROVED	PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl: 6
d				REP.	PRINCIPAL WIRING			10



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DESIGNATION/Bezeichnung <b>MANUAL CONTROL</b>	DRWG. NO./Zeichn.-Nr.: <b>EHS-3</b>	LOCATION/Ort: 	PLANT/Anlage: 
PROJECT/Projektbezeichnung <b>PRINCIPAL WIRING</b>	ORDER/Auftrag: 		PAGE/Bl: 6 10





Enclosure of "Operation Instruction + Functional Description" EHS-CM

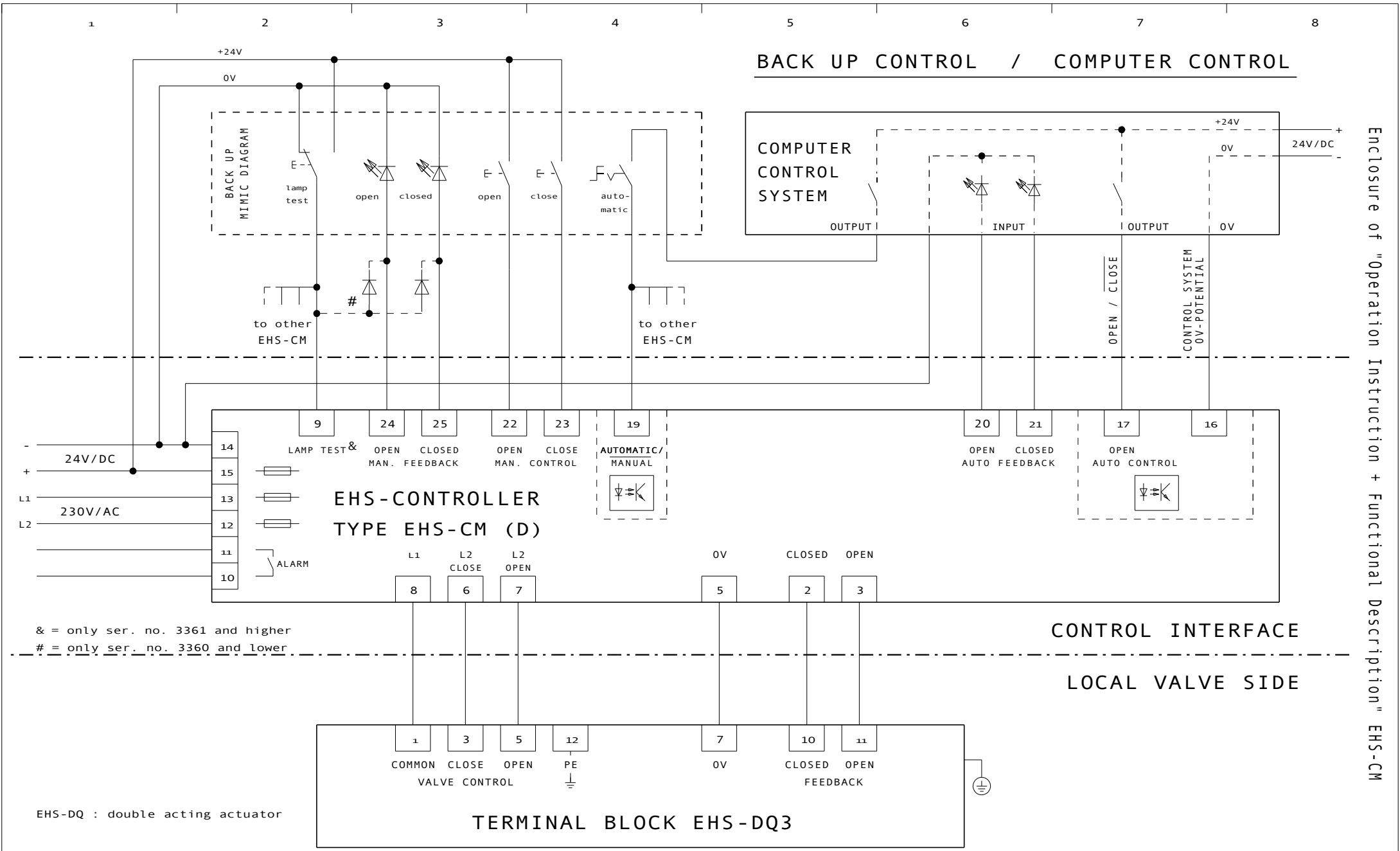
REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name
a POTENTIAL CONNECTION	17.09.99	Sch.	17.03.99	Schuster
b EHS/DQ3 TERMINAL 7 - 0V	09.12.99	Sch.		
c COMPUTER CONTROL	28.01.00	Sch.		
d				



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DESIGNATION/Bezeichnung	COMPUTER CONTROL
PROJECT/Projektbezeichnung	PRINCIPAL WIRING

DRWG. NO./Zeichn.-Nr.:	EHS-3	LOCATION/Ort:	PLANT/Anlage:
ORDER/Auftrag:		PAGE/Bl.:	7
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EHS-DQ : double acting actuator

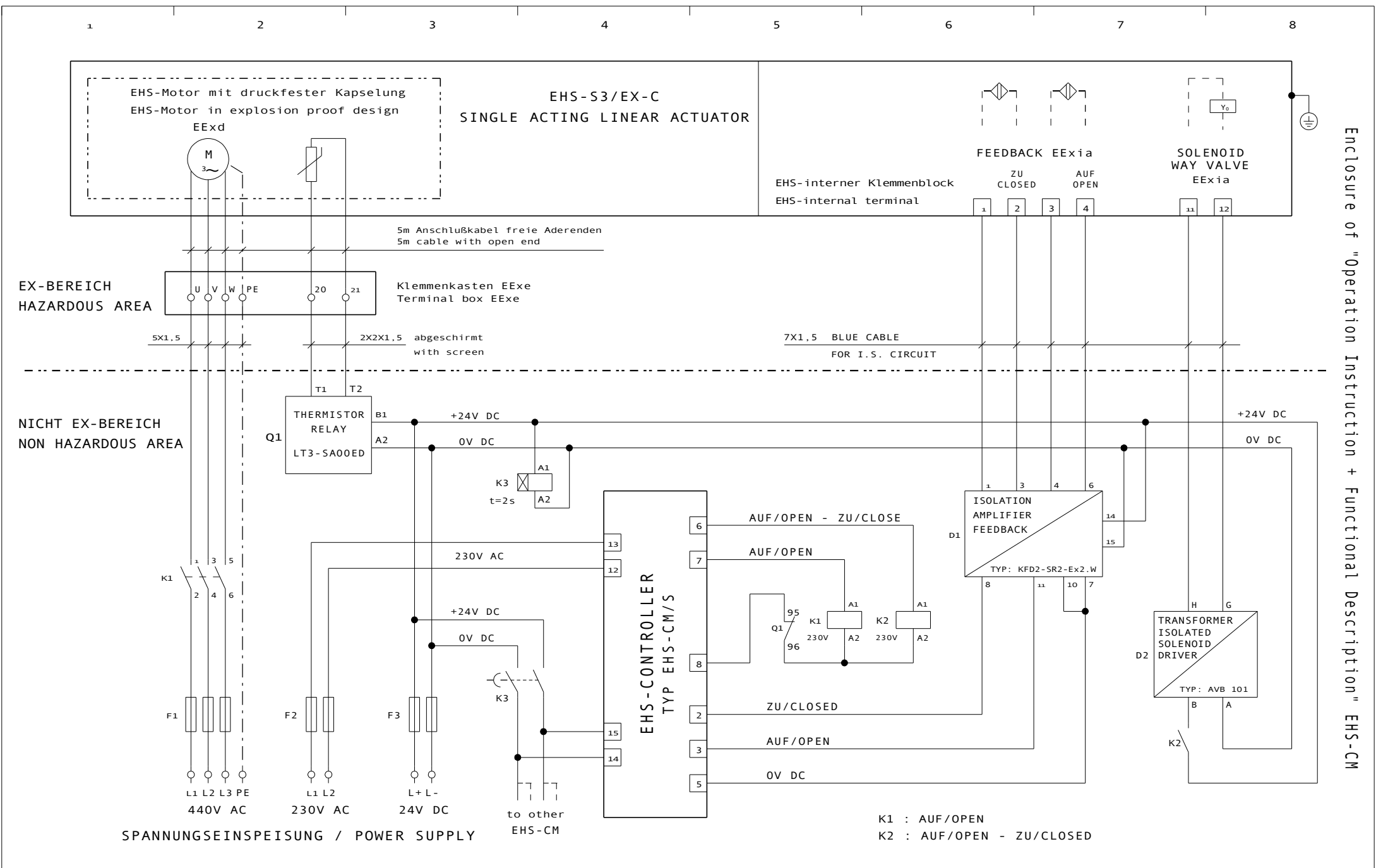
Enclosure of "Operation Instruction + Functional Description" EHS-CM

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name	DESIGNATION/Bezeichnung	DRWG. NO./Zeichn.-Nr.:	LOCATION/Ort:	PLANT/Anlage:
a	POTENTIAL CONNECTION	17.09.99	Sch.	DRAWN	BACK UP / COMPUTER CONTROL	EHS-3		
b	EHS/DQ3 TERMINAL 7 - 0V	09.12.99	Sch.	gez.				
c	SER. NO. / CONTROL	28.01.00	Sch.	APPROVED	PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl: 8
d				gep.	PRINCIPAL WIRING			10



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DESIGNATION/Bezeichnung	DRWG. NO./Zeichn.-Nr.:	LOCATION/Ort:	PLANT/Anlage:
BACK UP / COMPUTER CONTROL	EHS-3		
PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl: 8
PRINCIPAL WIRING			10



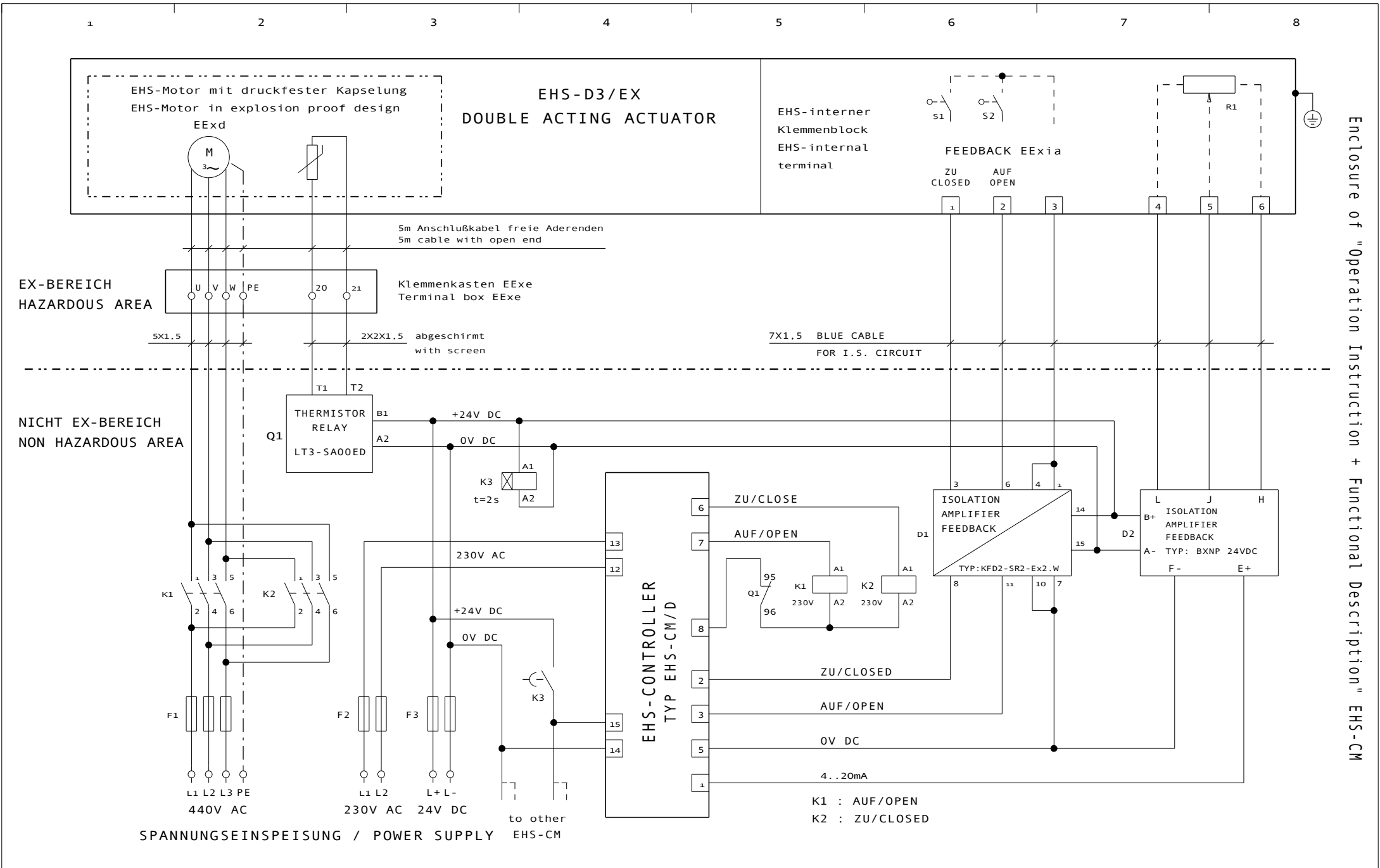
Enclosure of "Operation Instruction + Functional Description" EHS-CM

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name
a K3 / FEEDBACK	28.01.00	Sch.	01.12.99	Schuster
b PAGE 10 --> PAGE 9	14.04.00	Sch.		
c				
d				



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EHS-S3-EX / C // 440V AC	EHS-3		
PROJECT/Projektbezeichnung	ORDER/Auftrag:		PAGE/Bl: 9
PRINCIPAL WIRING			10



Enclosure of "Operation Instruction + Functional Description" EHS-CM

REVISION/Änderung	DATE/Datum	NAME/Name	DATE/Datum	NAME/Name	DESIGNATION/Bezeichnung	DRWG. NO./Zeichn.-Nr.:	LOCATION/Ort:	PLANT/Anlage:
a					EHS-D3-EX // 440V AC	EHS-3		
b								
c								
d					PRINCIPAL WIRING			

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