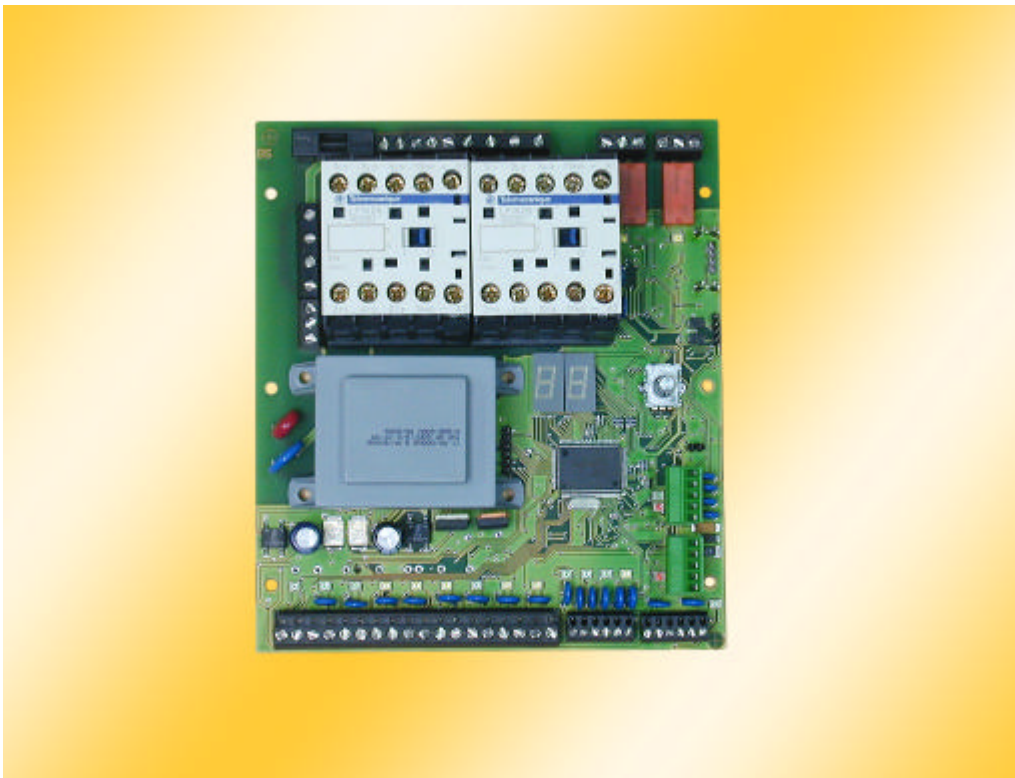


# WST 18

Operating Instructions  
No. 21.06.001.009



## Compact module control for

- Roller gates
- Sectional gates
- Sliding gates
- Hinged gates
- Folding gates
- Barriers

**Equipment:**

- silenced reversing contactor
- two signal relays
- Amplifier for primary closing edges on closing
- Amplifier for secondary closing edges on opening
- Plug-in terminals for controls station connection
- Segment display for basic menu-driven functions programming
- Status displays, e.g. cycle count
- Emergency push button
- Control keyboard in housing lid
- LEDs for clear connection and function control
- Connection for drives with mechanical limit switches
- Connection for GFA drives with digital DES limit switch
- Memory for statistical requests
- Display of last amendment
- Interface for modules which can be additionally obtained

**Safety:**

- Satisfies norms EN 12453 and EN 61508
- Hardware-like emergency shut-down circuit
- Current break in case of CPU failure
- Short circuit resistant control circuit
- Running time control
- Safety against permanent commands, e.g. defect switches
- Reversing delay

**Functions:**

- "Open" commands with automatic reverse
- Step-by-step function for 1-channel radio control
- Automatic closing after time
- Automatic closing after passing through
- Function for permanent operation
- Manual / automatic operation
- Photo-electric cell function with safety function and time reset
- Safety edge function with total or partial reverse
- Safety edge function with/without testing
- Pneumatic or contact edge connection
- Fraba safety system connection without extra amplifier
- Selectable functions for signal relay, from position status to traffic light control
- Automatic recognition of position transmitter
- Programming of end positions (in connection with DES)
- Extended menu (in connection with DES or additional modules)
- Special configuration possibilities for emergency operation following breakdown of safety facilities
- Cycle counter
- Storage of last errors that arose
- Storage of last configuration amendments made

**Extras:**

- Additional I/O card with 4 relays and 4 inputs for function add-ons, e.g. traffic light control to regulate right of way

## Table of Contents

<b>1. How the control concept works</b>		<b>9. Detailed description of functions</b>	
Set-up .....	4	Closing edges and contact edges .....	14
Digital limit switches .....	4	Automatic closing time.....	14
Add-ons .....	4	Close after release .....	14
<b>2. Safety guidelines</b> .....	<b>5</b>	Dead-man control .....	15
<b>3. Groundwork / Assembly guidelines</b>		Radio control - cable switch.....	15
Set-up .....	6	Partial opening.....	15
On-site measures .....	6	Manual/automatic operation .....	15
Assessing the unit .....	6	Advance warning .....	15
<b>4. Initial operation</b>		Running time control.....	15
Direction of rotation .....	7	Cycle counter.....	15
Segment display .....	7	Relays .....	15
Setting final positions.....	7	Level adjustment .....	15
Setting final positions with DES.....	8	Correcting the slowing-down path .....	16
<b>5. Controlling the installation</b>		<b>10. Retrieving information</b>	
with the help of the LED .....	8	Cycle counter.....	16
<b>6. Rotary switch - How it works</b> .....	<b>9</b>	Last occurred errors .....	16
<b>7. Numerical codes and menu structure</b> ..	<b>9</b>	Program version .....	16
<b>8. Configuring the control unit WST 18</b>		<b>11. Status display / Troubleshooting</b>	
Basic settings .....	10	Error codes .....	17
Positioning .....	11	Troubleshooting.....	19
Setting the functions .....	11	<b>12. Technical data</b> .....	<b>19</b>
Relays.....	13	<b>13. Appendix</b>	
Resetting to default settings .....	16	Summary of components 21.06.001.005 .	
		Terminal connection diagram 21.06.001.005	

## 1. How the control concept works

The WST 18 concept has been specially designed for use on doors and gates. One of the main features of the control unit is the universal configuration, its modularity and the program structure which enables specific customised designs.

The control unit offers an extensive range of functions which can be easily set via the segment display in connection with the rotary switch. At the same time, the operation and menu structure are always the same and the menus that cannot be used are blanked.

Conventional limit switches, inductive limit switches or a digital limit switch **DES** from GFA-Elektromaten GmbH can be connected to the control unit. Using a drive with DES will enhance the number of options even more. The end positions can be easily and conveniently programmed, for example. This is especially helpful for places which are difficult to access and considerably eases the workload.

In its standard design, the control unit comes equipped with two additional output relays. These output relays can be freely configured with an array of available functions. As a result, it is possible to set up a basic position indicator or a red/green traffic light control, for example.

Using the RM 44 I/O relay card, which is available as an optional extra, another 4 output relays can be switched. In doing so, the adaptation is detected automatically and the menus on the WST 18 extended accordingly. This means that the additional 4 relays can be individually supplied with one of the functions out of the range available which significantly increases its use for specific solutions. On top of this, permanent configurations can be pre-selected such as traffic light control to regulate the right of way or forward command for centrally controlling a second drive immediately via DIP switches.

The WST 18 unit has been produced in line with the high standards prescribed under EN 61508.

## 2. Safety guidelines

### WARNING!

Please read these operating instructions prior to operating the unit for the first time! Ensure that the unit has dead voltage prior to conducting any installation and maintenance work! **Performing work on a hot control board can result in death!** The unauthorised opening and improper intervention on the unit can result in physical injury and damage to property.

To avoid physical injury or significant damage to property, only qualified persons familiar with electrical drive equipment should be allowed to work on the control unit. Qualified persons are deemed to be those who are familiar with the setup, installation, initial operation and running of converters and who have the requisite qualifications for this kind of activity. They must be able to diagnose the tasks they are asked to conduct, recognise potential sources of risk and take adequate safety measures.

The control unit has been built and tested in accordance with EN 12453 "Safety in use of power-operated doors - Requirements" and prEN 12978 "Safety in use of power-operated doors – Requirements and testing procedures" and has left the works in fully safe and proper working order. In order to maintain this order and to ensure that it is operated without risk, the user must observe all of the instructions and warnings contained in these operating instructions.

The modification or conversion of the WST 18 control unit is only permissible upon prior consultation with the manufacturer. The operational safety of the supplied WST 18 control unit is only guaranteed if it is used in the manner prescribed. The limit values given in the technical specifications may not be exceeded under any circumstances (see relevant sections in the operating instructions).

### Safety regulations

When performing installation work, initial operation, maintenance jobs or testing the control unit, the valid safety and accident prevention regulations must be observed for the specific case in question. Above all, the following regulations must be adhered to. At the same time, no warranty is given for the completeness of the required regulations:

#### European norms

- EN 12445 Safety in use of power-operated doors – Testing methods
- EN 12453 Safety in use of power-operated doors – Requirements
- pr EN 12978 Safety in use of power-operated doors – Requirements and test methods

In addition to the above, the normative guidelines of the listed norms must be observed.

- VDE regulations
- DIN EN 418 Safety of machinery
- EMERGENCY OFF Set-up, functional aspects, design guidelines
- DIN EN 60204-1 VDE 0113-1 Electrical equipment with electric accessories
- DIN EN 60335-1 VDE 0700-1 Safety of household and similar appliances
- BGV A2 employer's liability insurance association regulations for health and safety
- ZH1/494 Guidelines for power-operated windows, doors and gates.
- Fire prevention regulations
- Accident prevention regulations

### 3. Groundwork

To ensure that the control unit is installed correctly, the following points, among others, must be checked and taken into account:

- The control board must be installed in a suitable housing. The housing must be suitable for use under the local conditions and environment.
- To maintain the IP protective class, it may be necessary to replace the cable entries with screwed cable glands. Where required, additional sealing measures should be taken.
- PVC insulated connecting leads may only be used in interiors!
- All of the poles on the control unit must be fuse protected against short circuiting and overload using a fuse rating of **max. 10 A** per phase. Depending on the design of the control unit, this can occur using a 1- or 3-pole automatic fuse breaker 'F0' (3 x 16 A) which is to be connected in series externally with the control unit in the house installation. In the event of an error, a higher fuse protection may result in the control unit being destroyed!
- When connecting the control unit via a permanent connecting lead using a 16 A CEE plug, please do the following: Install a CEE 16 A socket in the immediate vicinity of the control unit and fuse protect it as described above per phase conductor. Ensure that, once the control unit has been installed, the connecting lead with plug and socket can be accessed at all times!
- If the control unit is permanently connected to the house installation, please do the following: Connect the control unit via a permanently laid installation cable and fuse-protect the control unit as described above per phase conductor. To disconnect the control from the power supply, an additional all-pole cut-off device - such as a main circuit breaker which, at each pole, provides a contact gap which is in compliance with the conditions set forth in Overvoltage Category III for full disconnection - must be attached to the permanently laid installation!
- A risk analysis must be performed. The customer must ensure that the rolling gate, the sliding gate or the lifting element is protected and that no hazardous situations can arise if the final position is overrun.
- A minimum level of protection as well as adequate protective measures must be determined.
- The unit must be secured against the final position being overrun by limit stops, safety limit switches or other safety systems.
- The technical data of the connected power consuming devices such as photo cells or traffic lights must be checked. They must not exceed the permissible connected loads of the control unit.

## 4. Initial operation

- Detecting the position transmitter
- Position display - Segment display
- Setting end positions on contact or inductive limit switches
- Setting end positions on DES

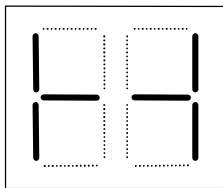
### **WARNING! Before accessing the terminal clamps, the control unit must be disconnected from the power supply network at all poles!**

Prior to initially switching on the mains power, connect the position transmitters to the terminal strips. Once the power supply is switched on, the control unit automatically detects what type of position transmitter is connected and configures the control unit accordingly. Should the control unit be wrongly configured by accident, it is very possible that no start is possible. In this instance, the control unit can be amended or reset via the menu.

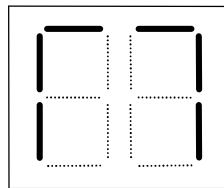
Once a power supply is fed in or a mains plug connected, the unit can then be run using the internal open and close buttons in the dead-man control\*. The direction of rotation **must** be in line with the command keys. If not, shut down the power supply and replace two motor leads.

Having checked the direction of rotation, the limit switches can be set or programmed:

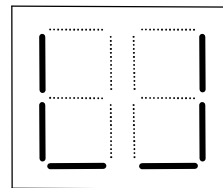
Position displays:



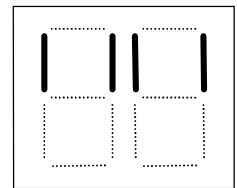
No limit switch



"Open" limit switch



"Close" limit switch



Command to program "open" limit switch

### **Setting the end positions of mechanical limit switches:**

- Move the door with the internal "open" button into the required final position "open".
- Fix the final "open" position at the correct stop point. The upper segments indicate the achieved end position. Check the shutoff point by opening again and adjust if necessary.
- Use the "close" button to move the door to the final "close" position.
- Fix the final position at the switch actuation point. The lower segments indicate the achieved end position. Check the shutoff point by opening again and adjust if necessary.

The unit can now be operated in dead-man control\*. For further settings, please go to 'Configuration'.

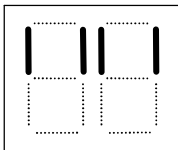
### **Setting the end positions with DES:**

The DES is a digital limit switch which is installed in drives by the company GFA-Elektromaten GmbH. The DES enables you to program the end positions and also offers further useful options which can be activated via the menus. Once it has detected a DES, the WST 18 will show a flashing segment display which indicates the need for programming.

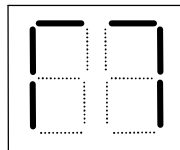
- a. Move the door with the internal "open" button into the required final position "open". Upper segment displays will flash.
- b. Press the internal STOP button for approx. 3 seconds until the display changes. The "open" position is now saved.
- c. Use the internal "close" button to move the door to the final "close" position. Lower segment displays will flash.
- d. Press the STOP button for approx. 3 seconds until the display changes. The "close" position is now saved.

The unit can now be run in dead-man control\*. For further settings, please go to 'Configuration'. The end positions can later be adjusted via a menu item.

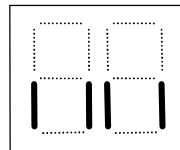
Displays:



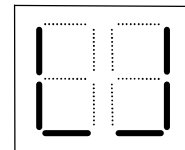
Request for programming of the upper end position



After programming: display of final "open" position



Request for programming the lower end position



After programming: display of the final "close" position

\*Dead-man control: The unit runs for as long as the command station is activated.

## **5. Controlling the installation**

With the help of the LEDs (light-emitting diodes) it is possible to run a concise check of the installation.

**Green LED:** The stop and safety circuits (normally closed). When in neutral position\*, all of the green LEDs should be lit up.

**Yellow LED:** When operating the command station (normally open). When in neutral position, all of the yellow LEDs should have gone off.

**Red LED:** When operating the closing edge. When in neutral position, the red LEDs should have gone off.

\*Neutral position: The display stands between the limit switches. Segment display Fig. 1



## 6. Rotary switch – How it works

The rotary switch has two functions. By turning the knob to the left or right, you will be able to retrieve the menu items (segment display), and by pressing the knob, you can confirm your selection.

The following list shows the main and sub-menus which have been assigned a numerical code or to a display. By setting the numerical code and then pressing the button, you will switch to the sub-menus and back again.

The means of programming is always the same:

1. **Switching on program mode:** Hold down the rotary switch for 3 secs. The main menu will be displayed.
2. **Selecting the main menu:** Turn the knob to set the relevant numerical code and then press to switch to the pertinent sub-menu
3. **Setting functions:** Make the relevant settings by turning to the pertinent numerical code and press to select. The display will switch to the main menu.
4. **Quit program mode: Turn the rotary switch** until the figure 00 appears in the display and then press the rotary switch.

## 7. Numerical codes - Menu structure

Explanations:

Certain menu items are only available in connection with the respective components. When using a DES or by connecting an I/O add-on, for example, other menus automatically become activated.

There are 3 types of menu structures:

a) As a rule, following a main menu will be a sub-menu which contains a variety of selection options.

Example:       Main menu 21 Function contact edge  
                  Sub-menus 1 to 3 for selection options

b) A main and sub-menu can also consist of a main menu and a setting parameter.

Example:       Main menu 23 Auto time lock  
                  Sub-menu 0...99 Setting the time (see blow)

c) Having selected a main menu, you will need to run a start.

Example:       Main menu 11 Correct end position  
                  Sub-menu -.- Command to run start

Please note:

The positions marked with a "(W)" have been configured as factory default settings.

A 3-digit number will be displayed when changing the display from hundreds digits to tens digits.

## 8. Configuring the WST 18 control unit

- .- = Position start. Once you have selected such a menu item, press the motion buttons.  
 (W) = Positions marked like this have been configured with factory default settings.

### Group 0: Basic functions

<b>01</b>	<b>Operating mode</b>		<b>save</b>
W	1	Dead-man control in open and close direction	Press rotary switch
	2	Self-stopping run in the direction of "open" and dead-man control in the direction of "close"	
	3	Self-stopping run in the direction of "open" and "close" Auto switching to dead-man control with internal key or key pad in the event of an error occurring in the safety device	
	4	Self-stopping run in the direction of "open" and "close" Auto switching to dead-man control with internal key or key pad in the event of an error occurring in the safety device	
<b>02</b>	<b>The safety edge "close" - How it works</b>		<b>save</b>
W	1	Without reverse	Press rotary switch
	2	With reverse 1 second after "open"	
	3	With reverse up to "open" position	
<b>03</b>	<b>The safety edge "open" - How it works</b>		<b>save</b>
W	1	Without reverse	Press rotary switch
	2	With reverse 1 second after "close"	
	3	With reverse up to "close" position	
<b>04</b>	<b>Change position transmitter – Special menu item</b>		<b>Save</b>
	0	The position transmitter must be connected. When selecting the function, a 0 will be displayed. Following this, press the "open" button. The display will switch to 1.	a. "Open" key
	1	Press the internal stop key for 3 seconds. The position transmitter will be scanned again. Function settings remain set.	b. 3 secs. stop key
<b>08</b>	<b>The photoelectric barrier "close" - How it works</b>		<b>Save</b>
W	1	Stop in close direction	Press rotary switch
	2	With reverse 1 second after "open"	
	3	With reverse up to "open" position	
	4	Stop following continuation in close direction	

### Group 1: Positioning

<b>11</b>	<b>Set final "open" position (only in connection with DES)</b>		<b>save</b>
	-.-	Use the internal keys to move to the required "open" position	Stop key
<b>12</b>	<b>Set final "close" position (only in connection with DES)</b>		<b>save</b>
	-.-	Use the internal keys to move to the required "close" position	Stop key
<b>13</b>	<b>Fine adjustment of final "open" position (only in connection with DES)*</b>		<b>save</b>
	-.0	The "open" position can be shifted to "open" or "close" by setting a value	Press rotary switch
	??0..9	Shift the "open" position to "open" by x values **	
	_.0..9	Shift the "open" position to "close" by x values ***	
<b>14</b>	<b>Fine adjustment of final "close" position (only in connection with DES)*</b>		<b>save</b>
	-.0	The "close" position can be shifted to "open" or "close" by setting a value	Press rotary switch
	??0..9	Shift the "close" position to "open" by x values **	
	_.0..9	Shift the "close" position to "close" by x values ***	
<b>15</b>	<b>Fine adjustment of premature shut down (only in connection with DES)*</b>		<b>save</b>
	-.0	Shut-down point for safety facilities shortly before the final "close" position is reached can be shifted to "open" or "close" by setting a value	Press rotary switch
	??0..9	Shift position to "open" by x values **	
	_.0..9	Shift position to "close" by x values ***	
<b>16</b>	<b>Set partial opening (only in connection with DES)</b>		<b>save</b>
	-.-	Use the internal keys to go to the desired partial opening position	Stop key

\* possible several times

\*\* turn clockwise

\*\*\* turn anti-clockwise

### Group 2: Setting the functions

<b>21</b>	<b>Safety edge "close" after premature shut down</b>		<b>save</b>
w	1	Safety edge stops without reversing	Press rotary switch
	2	Safety edge deactivated. Unit moves to final position (in the case of folding doors, for example)	
	3	Level adjustment. Safety edge stops without reversing. Adjustment to change in final position. Conditions: Only with DES, not in connection with pneumatic systems.	

<b>22</b>	<b>Correcting the slowing-down path (only in connection with DES)</b>		<b>save</b>
w	1	The slowing-down path of the unit is not taken into account	Press rotary switch
	2	Shut-down point is corrected around the slowing-down path (dyn. process)	
<b>23</b>	<b>Closing 1 - automatic locking by time</b>		<b>save</b>
w	0	Closing deactivated	Press rotary switch
	1..90	Time setting: 1-90 seconds Starts in end position "open"	
<b>24</b>	<b>Closing 2 – automatic locking through photo cells</b>		<b>save</b>
w	0	Closing deactivated	Press rotary switch
	1..90	Time setting: 1-90 seconds. Starts after passing the photo cells. In connection with Menu 23.	
<b>25</b>	<b>Radio control – cable switch</b>		<b>save</b>
	1	Terminal 14-15 for cable switch "Open-Close"	Press rotary switch
w	2	Function of terminal 14-15: for radio control, Open-Stop-Close as follow-up switch	
<b>26</b>	<b>Preliminary warning time "open"</b>		<b>save</b>
w	0	Advance warning deactivated	Press rotary switch
	3..50	Time setting: 3-50 seconds, starts after command "open" has been given	
<b>27</b>	<b>Preliminary warning time "close"</b>		<b>save</b>
w	0	Advance warning deactivated	Press rotary switch
	3..50	Time setting: 3-50 seconds, starts after command "close" has been given	
<b>28</b>	<b>Running time control for installations with limit switches</b>		<b>save</b>
	0	Running time control deactivated	Press rotary switch
w=300	5..300	Time setting: 5-300 seconds, starts after command has been given.	
<b>29</b>	<b>Partial Opening (see also further explanation)</b>		<b>save</b>
w	1	For partial opening (summer/winter).	Press rotary switch
	2	For control device partial opening	

**Group 5: Setting the relay switch points for functions 61.1 and 61.2 (only in connection with DES)**

<b>51</b>	<b>Relays K3</b>	<b>save</b>
	-. Use the internal keys to go to the required position	Stop key
<b>52</b>	<b>Relays K4 see Menu 51</b>	<b>save</b>
<b>53</b>	<b>Relays K5 see Menu 51 (with I/O card RM-4-4 and DIP 0)</b>	<b>save</b>
<b>54</b>	<b>Relays K6 see Menu 51 (with I/O card RM-4-4 and DIP 0)</b>	<b>save</b>
<b>55</b>	<b>Relays K7 see Menu 51 (with I/O card RM-4-4 and DIP 0)</b>	<b>save</b>
<b>56</b>	<b>Relays K8 see Menu 51 (with I/O card RM-4-4 and DIP 0)</b>	<b>save</b>

**Group 6: Setting the relay functions**

<b>61</b>	<b>Relays K3</b>	<b>save</b>
w	0 No function	Press rotary switch
	1 Impulse from internal stop position or prog. switch point (Menu 5) *	
	2 Permanent contact from internal stop position or prog. switch point (Menu 5)*	
	3 Traffic light function red	
	4 Traffic light function green	
	5 Position indicator "open"	
	6 Position indicator "close"	
	7 Flashing light function	
	8 Beacon	
	9 Fault alarm (safety circuit failure, etc.)	
	10 Power failure alarm	
	11 Control: brake motor	
	12 Door/gate moves into open direction	
	13 Door/gate moves into close direction	
	14 One of the safety edges is operated (no failure)	
	15 Impulse of 1 second during open command (e.g. light automation)	
	16 Traffic light function red, Traffic light off in close position	
<b>62</b>	<b>Relays K4 see Menu 61 (w=11)</b>	<b>save</b>
<b>63-66</b>	<b>Relays K5-K8 see Menu 61 (with I/O card RM-4-4 and DIP 0)</b>	<b>save</b>

\* int. stop pos. = intermediate stop position (additional limit switch required)

## 9. Detailed description of functions

### Closing edges / Contact edges

The control unit comes equipped with two amplifiers which provide the connections for the safety systems for fuse protecting "close", such as safety edge for the main closing edge, and for fuse protecting "open" phase, such as safety edges or cable switch as closing edges. See circuit diagram for installation.

The closing edge must be connected **prior** to switching on the power supply. The control unit will then evaluate the connected resistance value and thereby define the type of safety facility. Should the safety facility then need to be replaced again by a different type of safety facility, the power supply will need to be switched off and then on again after connecting. If a system should be faulty, a corresponding error alarm will be given and it will only be possible to operate in dead-man control.

The WST 18 control unit can evaluate various types of closing edges:

#### **Type 1: Pressure wave switch (break contact) with 1 K2 resistance connected in series (only for primary closing edge)**

Pressure wave switches with a terminal resistance of 1K2 (colour code: brown-red-red-gold). The functioning of this system is tested in the final "close" position. The pre limit switch "close" or the premature shut down on DES (Menu 15) is used to initiate the test function.

After premature shut down (shortly before reaching the final "close" position), a period of 2 seconds will count down. Within this time, it is necessary to actuate the system by touching down the contact edge. This actuation tests whether the pressure wave edge is intact. It is then possible to perform a run.

#### **Type 2: Self-monitoring contact edge (closing contact) with 8K2 parallel resistance**

This type of closing edge evaluation is for electric contact edges with a terminal resistance of 8k2 (colour code: grey-red-red-gold). The terminal resistance must be connected at the end of the contact edge or already be integrated.

#### **Type 3: Fraba system optical contact edge**

The principle behind this function is based on that of a one-way photo cell. When the contact edge is actuated, the ray of light is interrupted.

#### **Type 4: Cable switch as a closing edge (break contact principle) with 1K2 resistance connected in series**

For the closing edge, rope switches are to be used which can be pre-tensioned and activate a break contact when pulled or when the rope tears.

### Timer for close

If this function has been activated, the set time will expire once the final "open" position is reached. After the time has expired, the unit will automatically close. The switching of the photo cells automatically resets the time. A stop command will result in the automatic closing being interrupted.

### Closing after release

Each vehicle that passes through is registered by the safety photo cell in the "open" position. So long as the photo cell has been actuated, the safety function will remain intact. Once it has become free or a vehicle has crossed the photo cell, closing will occur after a set time. A stop command leads to the automatic closing being interrupted.

Please note: The door will only close if the photo cell has been actuated. Should no vehicle pass through, the door will remain open. If this is not what is needed, automatic closing 1 can also be activated after a lengthier period of time.

### **Advance warning**

In order to warn people that activity will be occurring at the door (e.g. by means of a red light), an advance warning time can be set. Only after the advance warning time has elapsed will the door motion be triggered. If an advance warning time has been set in "close", an advance warning will also be made upon automatic closing.

### **Dead-man control**

The door will only operate for as long as the command is actuated. This function is set for initial operation upon delivery. The function can also be activated as an emergency step via Menu 01 in the event that the safety facility should fail.

### **Radio control - cable switch**

Connection of a single push button, single key switch, radio control contact or cable switch possible via terminal 14-15. If activated, the function sequence will, irrespective of which way the door is moving, be in the steps Open...Stop...Close...Stop...Open... with movements in the final "open" and "close" positions. As an option, the function can be amended to Open-Close from the end positions in Menu 25.

### **Partial opening**

A selector switch allows you to select between two opening positions. To perform this option, it will be necessary to have an additional limit switch or to program a partial opening position on drives with DES.

### **Manual/automatic operation**

A selection switch allows you to deactivate the automatic timed closing actions. It is possible to operate this manually.

### **Running time control**

An additional protective mechanism for drives with slip clutch. If the current motion exceeds the standard running time, the door will be stopped.

### **Cycle counter**

The cycle counter is started upon initial operation and cannot be reset. Using the cycle counters, it is possible to check or set the maintenance intervals for the unit.

### **Relays:**

The WST 18 has integrated several functions for the output relays. These functions can be configured independently and individually for each relay. In the standard design, a simple red/green traffic light control with advance warning can be used. However, it is also possible to provide two "OPEN" position indicators, for example. This is especially useful for meeting special requirements. Where drives with brakes are concerned, a control function is integrated. The factory default setting for the function is set to relay K4.

**WARNING! Please observe the maximum load of the relays. Under certain circumstances, it may be necessary to fuse protect the circuit.**

### **Activation of a separate DC-break**

The brake is usually supplied by AC-voltage of the motor power line. Thus it is switched off in normal operation at the same time and therefore with a short delay related to the drive. In case of emergency, i.e. in case of activated safety edges the fastest possible stop must be realized. Therefore an additional with the option ' control break' (Menu 61/11) can be switched into the DC circuit. The brake relay is as fast as possible operated if the safety edges are activated.

The function cannot be applied to pneumatic systems. The WST 18 has the means to adapt the shut-down point of the drive to the changing ground conditions (e.g. installation of the unit prior to the floor being laid). At the same time, the shut-down point "close" undergoes constant change. The unit continues to edge forwards until the safety edge activates. As soon as it activates, the shut-down point is once again brought a little further forward.

### **Level adjustment (only in connection with DES)**

The function cannot be applied to pneumatic systems. The WST 18 has the means to adapt the shut-down point of the drive to the changing ground conditions (e.g. installation of the unit prior to the floor being laid). At the same time, the shut-down point "close" undergoes constant change. The unit continues to edge forwards until the safety edge activates. As soon as it activates, the shut-down point is once again brought a little further forward.

### **Correcting the slowing-down path (only in connection with DES)**

The WST 18 incorporates a function that allows the open and close position of the unit to be kept constant. The path between shutting down the contactors and the unit actually coming to a standstill (slowing-down path) may vary depending on the external influences. This is possible, for example, in the case of thermal loads or when the brake has worn down. The WST 18 registers any overrunning of the programmed shut-down position and shuts down the contactors correspondingly sooner on the next run. **WARNING!** This function may only be activated if the unit regularly undergoes maintenance! This must be performed to ensure that the unit does not take on a dangerous state through prohibited wear and tear or a lack of readjustment, for example (full loss of brake power).



## 10. Retrieving information

### Group 9: Information and resetting to default settings

91	Cycle counter (7-digit)		Selection
	0..7	Upon pressing the adjusting knob, 7 digits will be displayed one after another in the <u>right-hand</u> segment. By overlaying the graduation lines in the left-hand segment, it is possible to see how far the digit sequence has run. The first graduation line is for digit 1, the second for digit 2 and so on. The digits written one after another in the <u>right-hand</u> segment represent the number of cycles as a figure. Example: 0003526 for 3526 cycles.	Press adjusting knob
92	Display of the last 2 errors		Selection
	F..	Upon pressing the adjusting knob, the numerical codes for the last two errors which have occurred will be displayed alternately.	Press adjusting knob
93	Last configuration amendment		Selection
		Upon pressing the adjusting knob, 7 digits will be displayed one after another in the <u>right-hand</u> segment. By overlaying the graduation lines in the left-hand segment, it is possible to see how far the digit sequence has run. The first graduation line is for digit 1, the second for digit 2 and so on. The digits written one after another in the <u>right-hand</u> segment represent the cycle number when the last program amendment was performed.	Press adjusting knob
94	Displaying the program version		Selection
		The program version is displayed.	Press adjusting knob
95	Resetting to default settings (factory condition)		save
	0	On selecting the function, a 0 is displayed. To activate the reset, then actuate the internal Open key. The display will switch to 1.	a. Open key
	1	Press the internal stop key for 3 seconds. A reset will be performed.	b. 3 sec. stop key

## 11. Status display / Troubleshooting

When the unit is running as normal, the current status of the control unit will be displayed. The display of errors and commands occurs as a series of letters and numbers which are displayed alternately.

- Upon activating a command, flashing lower or upper segments will be displayed on the control unit to indicate the direction of movement currently in operation. Once the position has been reached, the segments will switch from a flashing to a permanent display.
- The activation of a command is indicated by means of an **E** followed by a code.
- An error is indicated by means of an **F** followed by a code.

Display	Description	Remedy	Terminals	
F 11	Safety circuit triggered	Check the emergency manual operation, arrester contact. Is the unit overloaded or blocked?	X3	3-4
F 12	Slip door contact opened	Check whether the slip door is closed or whether a line has been disconnected in the cabling.	X6 X7	4-5 4-5
F 13	Safety circuit DES	Check whether the slack rope contact is closed or whether a line has been disconnected in the cabling.	X5	1-5
F 14	Emergency Off contact activated	Check whether the emergency Off control unit is activated or whether a line has been disconnected in the connecting lead.	X3	1-2
F 17	Slip door switch defective	The slip door switch with monitoring device registers a defect. Check the switch and the line.	X6/X7	4-5
F 18	Inlet for slip door switch	Power supply for slip door switch has fallen short. Check power supply.	X6/X7	4-5
F 20	"Close" safety edge not recognised	Check that the safety edge is properly connected or whether the wrong operating mode has been set	X6	1-2-3
F 21	Photo cell activated	Check whether the photo cell has been properly aligned or whether a line has been disconnected in the connecting lead.	X3	12-13
F 22	The "close" safety edge is activated twice in a row during closing	Check whether any obstacles are in the vicinity of the door or whether a line has been disconnected in the connecting lead or the connecting lead has short circuited. Perform the closing operation until the end position "close" is reached	X6	1-2-3
F 24	Close safety edge 8k2 activated	Check the activation of the safety edge. The connecting lead may have short circuited.	X6	2-3
F 25	Close safety edge 8k2 defective	Check the safety edge and connecting lead for possible interruption.	X6	2-3
F 26	Pneumatic safety edge 1k2 activated	Check the activation of the pneumatic safety edge. The connecting lead may have been interrupted.	X6	2-3
F 27	Pneumatic safety edge 1k2 defective	Check the pneumatic safety edge and whether the connecting lead may have short circuited.	X6	2-3
F 28	Pneumatic safety edge 1k2 testing negative	Check function. The activation must occur in the lower final position (confirmation).	X6	2-3
F 29	Optical close safety edge activated or defective	Check the activation of the closing edge or whether the connecting lead has been interrupted.	X6	1-3-5
F 30	No door position set	Door positions must be set.		
F 31	Upper emergency limit switch range activated	With the unit idle (dead voltage), back up the unit using the emergency manual handle or reset the upper final position.		
F 32	Lower emergency limit switch range activated	With the unit idle (dead voltage), back up the unit using the emergency manual handle or reset the lower final position.		
F 33	No limit switch	Both limit switches (open and close) are activated		

Display	Description	Remedy	Terminals	
F 51	ROM error	Reset the control unit by switching off and on and replace the control unit if necessary.		
F 52	Register error	Reset the control unit by switching off and on and replace the control unit if necessary.		
F 53	RAM error	Reset the control unit by switching off and on and replace the control unit if necessary.		
F 54	Internal control error	Reset the control unit by switching off and on and replace the control unit if necessary.		
F 55	DES not active	Check the connection to the DES. Reset the control unit by switching off and on and replace the DES if necessary.		
F 56	Drive not running	A phase des mains is blocked or has failed. Check the door mechanics. Check the rotary movement of the limit switch shaft. Check the motor connection.		
F 57	Rotating field incorrect (in connection with DES)	Exchange the phases on the power supply cables or the motor.		
F 58	Failure cycloconverter (in connection with cycloconverter)	Failure in cycloconverter		
F 59	Running time error	The normal running time for a complete run is exceeded. The drive is blocked. Slip clutch too loose or defective. The limit switch is not yet adjusted, see Troubleshooting.		
F 60	Open safety circuit not recognised	Check that the safety edge is properly connected or whether the operating mode has been incorrectly set.	X7	1-2-3
F 64	Open safety circuit 8k2 activated	Check the activation of the safety circuit. The connecting lead may have short circuited.	X7	2-3
F 65	Open safety circuit 8k2 defective	Check the safety circuit and whether the connecting lead has been interrupted.	X7	2-3
F 66	Open safety circuit 1k2 activated	Check the safety circuit and whether the connecting lead has been interrupted.	X7	2-3
F 67	Open safety circuit 1k2 defective	Check the activation of the safety circuit. The connecting lead may have short circuited.	X7	2-3
F 69	Optical open safety edge activated or defective	Check the activation of the closing edge or whether the connecting lead may have short circuited.	X7	1-3-5
F 81	Operation Timing error	Programmed operation time too short. The control has not registered off-carriage, yet. Longer operation in position.		
E 11	An open command is triggered		X3	7
E 12	A stop command is triggered		X3	5-6
E 13	A close command is triggered		X3	8

## Troubleshooting:

Problem	Cause	Remedy
No start possible and no error is displayed	No limit switches connected	Connect limit switches to terminal strips
	"Open" and "close" limit switches both open	Check limit switches. Check wiring.
	Wrong position transmitter configured	Reset the position transmitter via Menu 04
	No position transmitter DES connected when device switched on	Reset the position transmitter via Menu 04
No reverse function when safety facility activated	The "close" pre limit switch is not connected or no bridging has occurred or no break contact installed (see wiring diagram)	Connect the pre limit switch or bridge
no or limited menu settings available	safety circuit e.g. emergency stop is activated.	close safety circuit. Set control into operating mode.

## 12. Technical data

Line voltage: 3 Ph 400 V/N/PE ±10%, 50/60 Hz (Standard)  
 3 Ph 230 V/N/PE ±10%, 50/60 Hz  
 3 Ph 400 V/PE ±10%, 50/60 Hz  
 1 Ph 230 V/N/PE ±10%, 50/60 Hz

ext. fuse protection for mains: max. 10 A t  
 max. power capacity: 1,1 KW acc. standards (equipment 2,2 KW)  
 max. motor current: 5 A

Control voltage: 24 V DC  
 Control current: 10 mA  
 Control fuse: 1 A t

ext. power supply: 24 V DC  
 max. output current: **150 mA**  
 Fuse protection: 200 mA self-resetting

Control inputs: 24 V DC, 10 mA,  
 Wiring of inputs: use only floating contacts

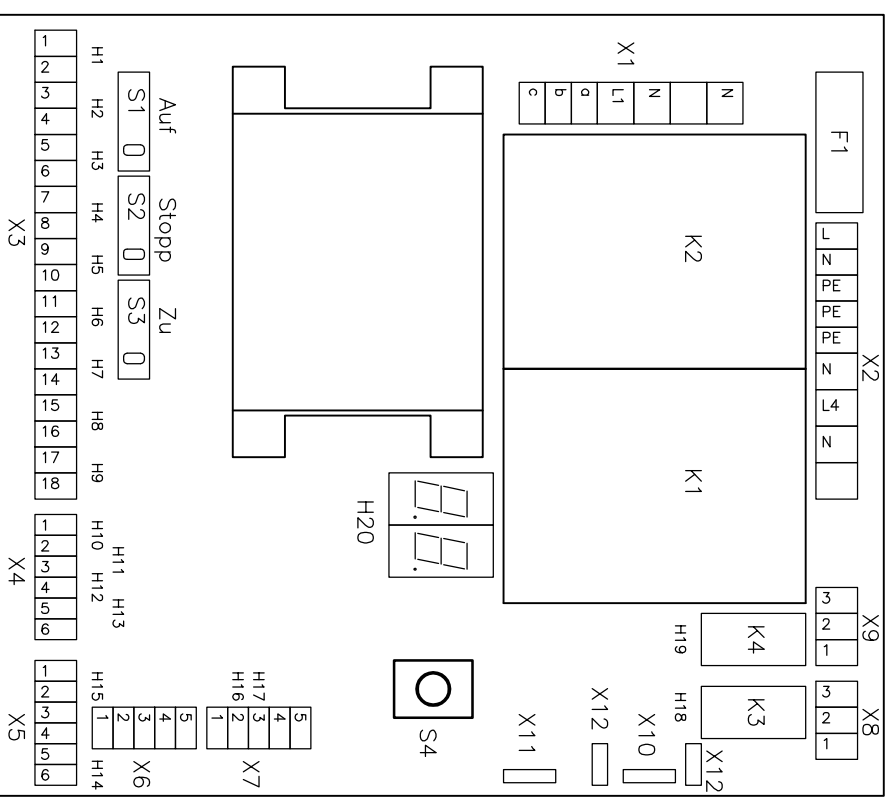
Relay outputs: floating, 2-way contacts  
 max. switching current: ohmic load 1A

Temperature range: -10...+50°C  
 Moisture range: max. 95%, non-condensing

Protective class: in housing IP 55  
 Life time cycle: 500.000

# A1

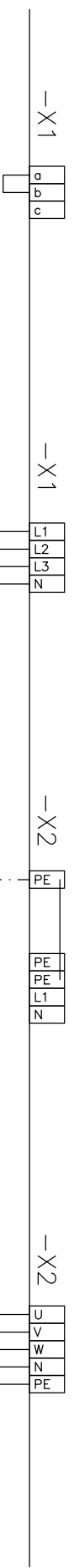
## Assembly Diagram



- A1 Control circuit WST 18
  - F1 Control circuit fuse 1A
  - H1...19 refer to terminal connections
  - H20 Segment display
  - K1 contactor 'OPEN'
  - K2 contactor 'CLOSE'
  - K3 Signal relay, max. current 2A
  - K4 Signal relay, max. current 2A
  - S1 Command switch 'open'
  - S2 Command switch 'stop'
  - S3 Command switch 'close'
  - S4 menu switch
  - X1 Terminal strip mains supply
  - X2 Terminal strip motor connection
  - X3 Terminal strip control devices
  - X4 Terminal strip position limit switch
  - X5 Terminal strip digital limit switch DES
  - X6 Terminal strip protection in close direction
  - X7 Terminal strip protection in open direction
  - X8 Terminal strip signal relay K3
  - X9 Terminal strip signal relay K4
  - X10 adapter extension
  - X11 Interface for add-on modules
  - X12 Connector for safety section contactor
- enclosed:
- R1 8,2K resistor (grey-red-red-gold)
  - R2 8,2K resistor (grey-red-red-gold)
  - R3 1,2K resistor (brown-red-red-gold) for pneumatic system

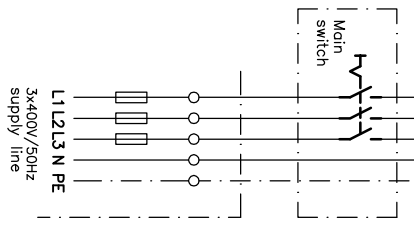
Ensure that the unit has dead voltage prior to connecting any installation or maintenance work!

gez.	04.04.08	Reise	Datum		Name	
gez.			Blatt-Nr.		Blatt	
gez.			21.06.001.009-01		1	
gez.			Projekt-Nr.		von	
gez.			XXXX		5	
Gesellschaft für phys. Technologie und Elektronik GTE Industrieelektronik, Heimholzstr. 38-40, D-41747 Versen			Benennung		assambley A1	
Kunde			Blattinhalt		assambley diagram WST 18	

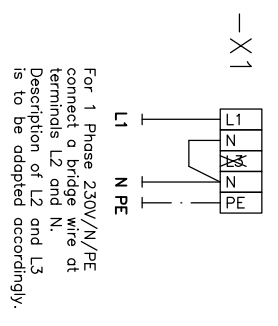


Meins Voltage Selection:  
 Bridge Wire a-b 1~230V/N/PE  
 3~230V/N/PE

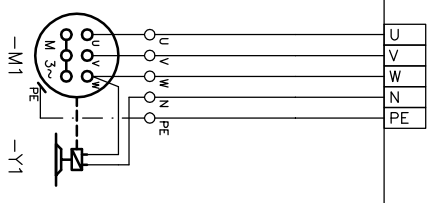
ATTENTION!  
 A wrong connection of the bridge wire  
 can damage the circuit!



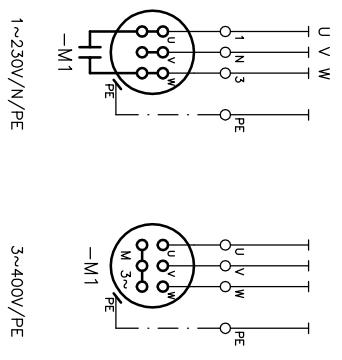
Fuse protection according  
 current consumption of motor.  
 Max. 10 A



Power supply 230V/N/PE for  
 external equipment for  
 example photocell or detector.  
 Max. current consumption 2A



3~400V/N/PE  
 motor with break 230V

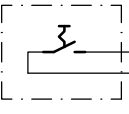
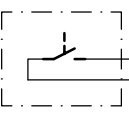
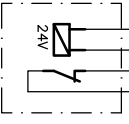
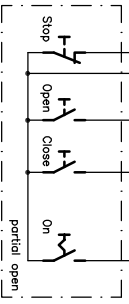
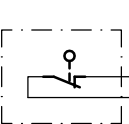
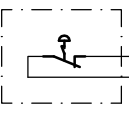


gez.	04.04.08	Datum	Resse	Name	<p>Gesellschaft für              phys. Technologie              und Elektronik              GTE Industrietechnik, Heimholzstr. 38-40, D-41747 Versen</p>	Kunde	Benennung WST 18 Circuit	Blattinhalt Terminal Strip X1, X2 Supply, Motor, Relays	Zeich.-Nr. 21.06.001.009-02 Projekt-Nr. XXXX	Blatt 2 von 5
gez.										
gez.										
gez.										
gez.										

LED: H1 H2 H3 H4 H5 H6 H7 H8 H9

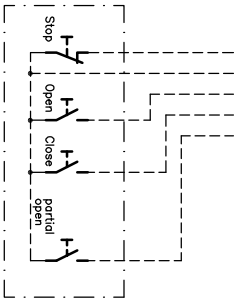
Terminal 10+11:  
24VDC power supply for  
external loads. Maximum  
current 150mA !

24VDC  
Positive  
Pole



Remove bridge wires if connecting!

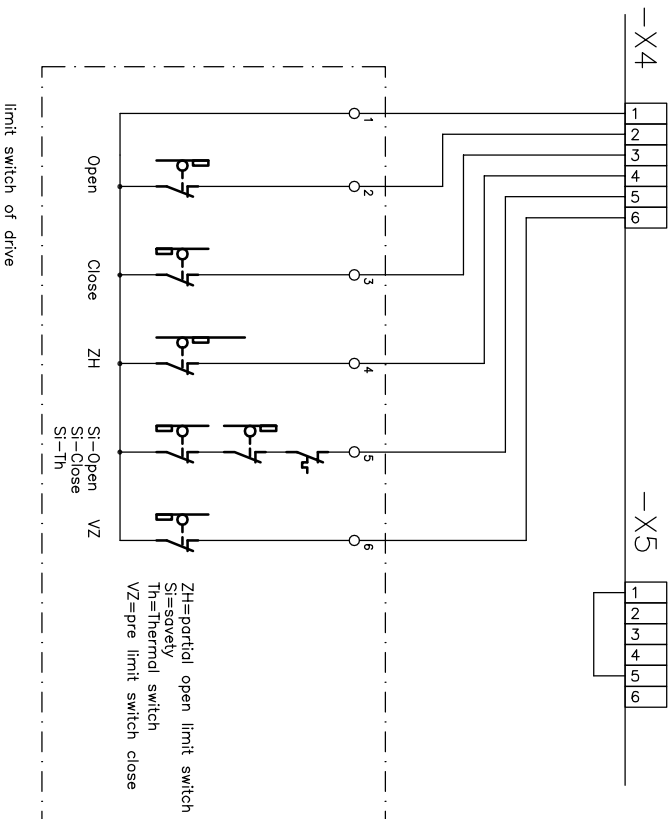
option:  
To functional change see menu 29



gez.	04.04.08	Nome	Rose	<p>Gesellschaft für phys. Technologie und Elektronik GTE Industrieelektronik, Heimholzstr. 38-40, D-41747 Versen</p>	Kunde	Benennung	WST 18 Circuit	Blattinhalt	Terminal X3 Command Devices	Zeich.-Nr. 21.06.001.009-03	Projekt-Nr. XXXX	Blatt	3	von	5
gez.															
gez.															
gez.															
gez.															

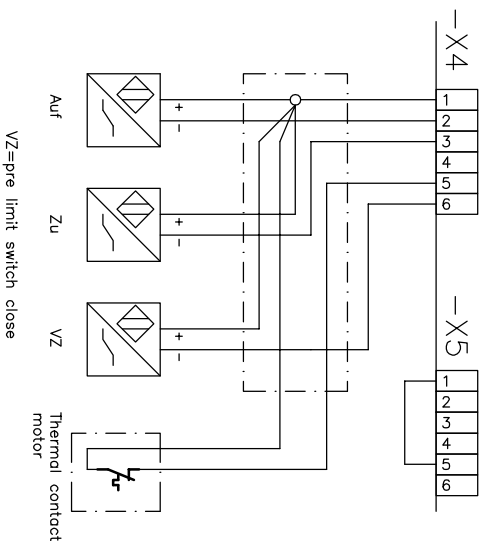
LED: H10 H11 H12 H14 H13

X4: Connection for drives with limit switch



Information to connect limit switches on X4:  
Remove bridge wire at terminals 1-5 before connecting the safety limit switch.  
The pre limit switch VZ is used to start the test phase if pneumatic safety edges are applied. If other safety systems are integrated the limit switch stops the rewind.  
For installation without pre limit switch connect bridge wire to terminals 1-5.

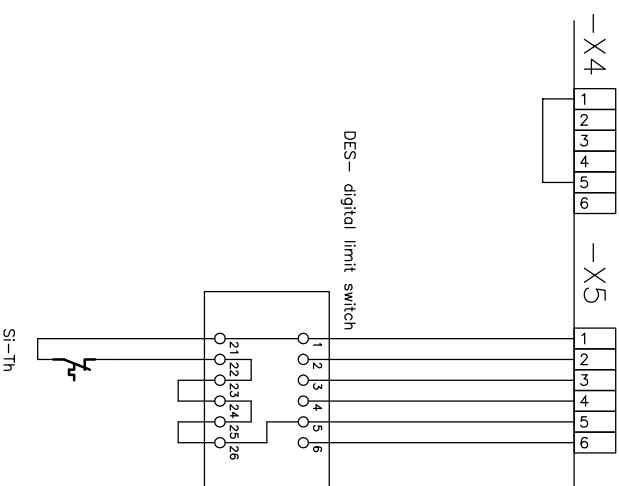
option  
X4: Connection when inductive limit switch (gates with limit stopper)



Specification of inductive limit switches:  
Namur 2-cable Sensor normal closed  
Operating voltage 5...25V DC  
Current consumption activated < 1,0 mA  
Current consumption not activated > 2,5 mA  
e.g. Sick IM18-08N-N-ZWO Namur

Information to connect inductive switches on X4:  
Please pay attention to use only suitable limit switches!  
Remove bridge wire at terminals 1-5 before connecting the safety limit switch or thermal fuse contact.  
The pre limit switch VZ is used to start the test phase if pneumatic safety edges are applied. If other safety systems are integrated the limit switch stops the rewind.  
For installation without pre limit switch connect bridge wire to terminals 1-5.

X5: Connection for drives with digital limit switch DES



Attention! Remove bridge wire 1-5 if connecting DES.

gez.	04.04.08	Datum
gez.		Name
gez.		Rosse
gez.		
gez.		
gez.		

**GTE** Gesellschaft für phys. Technologie und Elektronik  
GTE Industrieelektronik, Heimholzstr. 38-40, D-41747 Versen

Kunde

Benennung  
WST 18 Circuit

Blattinhalt  
Terminal X4 + X5  
Limit Switch Options

Blatt	4
von	5
Zeich.-Nr.	21.06.001.009-04
Projekt-Nr.	XXXX



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

LED:

H15

Protection of close direction

H17

H16

Protection of open direction/draw-in protection

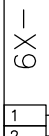
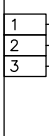
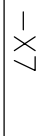
H17

H18

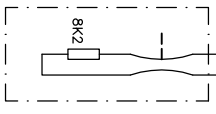
-K3

H19

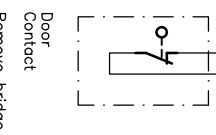
-K4



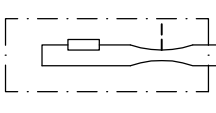
Contacts for warning beacon, flashing lamp, failure indicator, position indicator.  
Configuration of relays with aid of WST 18 menu.



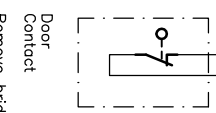
Safety edge with BK2 resistor for protection of the closing direction.  
Resistor color code grey-red-red-gold



Remove bridge wire when connecting.  
Door Contact

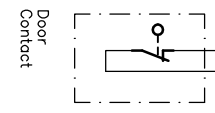
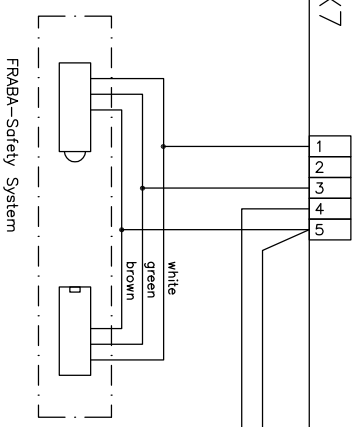
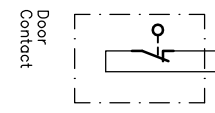
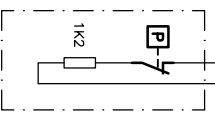
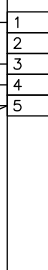
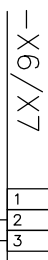


Safety edge with BK2 resistor for the draw-in or for shear protection in open direction.  
Resistor color code grey-red-red-gold



Remove bridge wire when connecting.  
Door Contact

Optional Application for X6,X7:



Pneumatic safety edge.  
Connect enclosed 1K2 resistor to pneumatic safety switch. Resistor color code brown-red-red-gold

gez.	04.08.08	Datum	Reise	Name	 Gesellschaft für phys. Technologie und Elektronik GTE Industrietechnik, Helmholzstr. 38-40, D-41747 Versen	Kunde	Benennung	WST 18 Circuit	Blattinhalt	Terminal X6, X7, X8, X9 Closing Edge Protection	Zeich.-Nr. 21.06.001.009-05	Projekt-Nr. XXXX	Blatt 5 von 5
gez.													
gez.													
gez.													
gez.													