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**DOOR COMPANY**

TS723

(Model Years 11/01 thru 11/06)

Microprocessor Control System for three-phase drive units

The TS723 control system is designed for three-phase motors to open and close sliding doors and is to be used for industrial applications only. The acceleration and deceleration of the motor is adjustable as well as the travel speed of the door. The positions of the door are controlled by an integrated position control system (encoder). As the drive unit is equipped with a position control system, the TS723 control system recognizes this automatically. Both drive unit and control system are electronically protected against damage from overload or a short circuit. All programming and adjustments are carried out with membrane keys located on the outside of the closed case - after all connections have been done. For safety reasons, no adjustments are possible within the case.



TECHNICAL DATA

Mains voltage 208 / 230 / 400 / 460 / 480 VAC / 1 / 60

Power consumption 4.0 amps

Output voltage (secondary) 24VDC

Power supply (secondary) max. 1020 mA

Output voltage to motor 230 VAC (3-phase)

Motor rating max. 370 watts

Dimensions HxWxD = 6 1/2" x 20 1/2" x 4 5/8"

I. Electrical Connection

I/1 Connection of external devices

Connect all wires (maximum length: 90 feet) from the external devices (operating switches, reversing edges, etc.) to the external leads of the controller per instructions below in Section I/2 & I/3. When using the control system together with drive units with an electronic position control system (encoder), no additional limit switches are required. The encoder is recognized automatically by the control system. Make sure there is a lockable switch in the supply line to control system that will cut off the power supply completely. **Furthermore, a separate fuse must be provided on the site to protect the supply line and the connection terminals of the control system.**

I/2 Wiring connections for pull switch stations, 2-button switch, locks

Note: Pull switch stations & 2-button switches (if supplied) must be wired normally open & in parallel. Locking device (if supplied) must be wired normally closed & in series with reversing edge.

Connect pull switch stations to leads labeled "Pull Switch/Push Button"

Connect "Open/Close" feature of 2-button switch (if supplied) to leads labeled "Pull Switch/Push Button"

Connect "Partial Open" feature of 2-button switch (if supplied) to leads labeled "Partial Open"

Connect locking device (if supplied) to leads labeled "Lock/Stop"

I/3 Wiring connections for reversing edge

Connect reversing edge to leads labeled "Reversing Edge"

Note: Reversing edge must be wired normally closed & in series with locking device (if supplied) and/or photocell (if supplied).

I/4 Wiring connections for photocell (if applicable)

Run wires from terminals 1 & 3 (in photocell) to leads labeled "Reversing Edge"

Run wires from power supply terminals (in photocell) to leads labeled "24 Volt/Aux Power"

Make sure that photocell switch is set to "LIGHT"

Note: If using a photocell & reversing edge together, they must be wired in series

I/5 Wiring connections for radio receiver (if applicable)

Connect RED wire from radio receiver to lead labeled "24 Volt/Aux Power"

Connect BLACK wire from radio receiver to lead labeled "24 Volt/Aux Power"

Connect GRAY wires from radio receiver to leads labeled "Pull Switch/Push Button"

I/6 Wiring connections for motion detector (if applicable)

#1 wire from motion detector to lead labeled "24 Volt/Aux Power"

#2 wire from motion detector to lead labeled "24 Volt/Aux Power"

#3 wire from motion detector to lead labeled "Pull Switch/Push Button"

#4 wire from motion detector to lead labeled "Pull Switch/Push Button"

Dips on motion detector

#1 - on

#2 - off

#3 - off

#4 - on

Note: Both "Open" & "Close" Controls must be set at "Full Travel"

"Automatic Closing" must be set to "On"

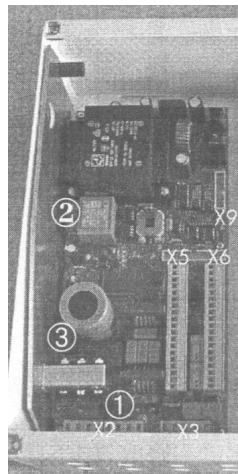
I/7 Location of fuses

1 Fuse F1: T 4.0 A Main fuse (time-lag fuse)

(Complete 230V AC supply)

2 Fuse F2: T 0.25 A 24VDC power pack (time-lag fuse)(primary protection)

3 Fuse F3: FF 10 A Intermediate circuit



II. Adjustment/Programming

All adjustments and programming are carried out with the membrane keys and the LCD

display on the lid of the control system. On the following page, you will find the adjustment menu with all adjustable functions and values. Please mark in the right hand column, the values you adjusted in your control system. Detailed information on how to adjust the speeds and the positions of the door can be found on pages 9 and 10.

WARNING: Never make any adjustments when the door is moving!

II/1 Operation

- 1) Switch on the mains power supply. The LCD display on the lid will show for a short time, the number of the software update used in this control system. Afterwards, it switches to "POWER ON / SYSTEM OK". You can now start programming the control system.
- 2) Pressing the "ENT" key allow you to access the adjustment menu. When placing the control system into operation for the first time, the display will ask you to select a language. You can choose between English, German, French, Italian, and Spanish.
- 3) The password is preset in the factory at "0000". When the display asks for a password, press the "ENT" key. This will allow you easy access to all functions of the controller. Once you have finished making adjustments, go to "Select New Password" in the menu and enter a new password to protect your adjustments. Please note your password and keep in a secure place. Detailed information on how to select a new password can be found on page 15.
- 4) If none of the keys are pressed for more than 10 minutes, the display returns back to the highest level of the menu ("POWER ON / SYSTEM OK"). This is a safety function that prevents anyone from making any adjustments without the proper password.

II/2 Functions of the keys

With the "ENT" key (ENTER)

...you select the just displayed point of the menu

...you go to the next lower level of the menu

...you open the input area within the angle brackets (input area is flashing)

...you confirm and enter the values adjusted in the flashing input area

...you confirm (=yes)

With the "ESC" key (ESCAPE)

...you go back to the previous, higher, menu level

...you leave the opened flashing input area without selecting and entering the adjusted values

With the arrow keys (UP & DOWN)

...you select a function within one menu level

...you adjust the value in the opened flashing input area

II/3 Adjustment/Programming

a) Adjustment of the Position Control System

If you adjust these values for the first time: when selecting the function "Adjust Door Limit Encoder Values", the display of the control system will ask you to move the door by pressing the "OPEN" or "CLOSE" switch to the 4 different positions and to register these values. The control system sets the control function automatically to "Dead Man Function" and the motor adjustment to "Crawling Speed".

Position Door CLOSED: Normally the door is closed when you start with the adjustments. Press the "ENT" key to register this position.

Position CRAWL CLOSE: Press the "OPEN" switch to move the door from the closed position to the position where you want the door to switch to the creep speed before reaching the closed position (normally 8 inches before the CLOSED position). Press the "ENT" key to register this position.

Position CRAWL OPEN: Press the "OPEN" switch to move the door to the position where you want it to change to crawling speed (normally 12 inches before the OPEN position). Press the "ENT" key to register this position.

Position Door OPEN: Press the "OPEN" switch to move the door to the required opened position. Press the "ENT" key to register this position.

Make sure that the values for the encoder positions "CLOSED", "CRAWL CLOSE",

"CRAWL OPEN", and "OPEN" are each larger than the previous one. The value of the encoder for the CLOSED position must be higher than 030.

II/4 Adjustment/Programming

Modification of the encoder values: The point of the menu "Adjust Door Limit Encoder Values?" also offers you the possibility to modify or correct at a later time the adjusted values. The registered values should be modified only in small steps.

IMPORTANT: Every time you modify the encoder values, the control system sets the function back to "Dead Man Function". After having finished the modification, you have to select again the control function you require. The door can be positioned to 1 cm exactly (1 digit of the encoder value is approximately 1/4").

b) Programming the Control Functions

Apart from selecting between "Dead Man Function", "Full Travel" (impulse) or alternating "OPEN-CLOSE" function, you can adjust the automatic closing. If the "Automatic Closing" is activated, you can adjust the "Hold Open Time" between 0 and 999 seconds.

The "Position for Partial Opening" is adjusted as well in this point of the menu. This position is determined by a time of between 2 and 99 seconds (the door opens for the adjusted time and then stops).

c) Motor adjustments when putting the installation into service the first time

Before adjusting the parameters for the "Opening Speed", "Soft Start" and "Quick Stop", you should try the parameters of the default configuration (see the values in the angle brackets on the menu page 8). *Make sure you change the values only in small steps. The parameter for the nominal motor power has to be adjusted for the connected drive unit.*

-Function Soft Start:

This value determines inclination of the starting ramp, i.e. the acceleration when the motor starts. The same ramp applies for the deceleration of the motor when the motor is switched off by a limit switch, the internal position control system or a "STOP" push-button. The ramps can be set at different values for opening and closing.

-Function Quick Stop:

With this value, you select how fast the door stops when the safety device has been

activated.

II/5 Adjustment/Programming

d) Adjust the safety device

"Safety Device causes": different functions of the safety devices are possible:

- "Temporary Stop @ Close": the door automatically continues to close, 2 seconds after the safety device is free again.
- "Permanent Stop @ Close": the door stops until it gets a new command.
- "Door Opening 2 s.": the door reopens for 2 seconds when the safety device responds and then remains in this position until it gets a new command. If the automatic closing is activated, the door will close automatically after the adjusted time.
- "Complete Opening": the door opens completely when the safety device responds. This function is recommended and pre-set at the factory.
- "Stop @ Open + Close": the door stops when the safety device responds, both in opening and closing direction.

e) Set Relay contact K1

"Contact K1 active on": the relay contact can be used to activate for example, a flashing light, as long as the door is moving. Or it can connect with a security central to pass on information on the position of the door (e.g. door closed).

"K1-Time Before Door Motion": this is necessary , for example, for flashing lights that normally should already start flashing before the door starts to move.

"Operation of K1": Impulse 1 or 5 seconds is necessary for the operation of locking magnets. If you adjust the operation to "Flashing Contact", a normal lamp can be used as a flashing light.

f) Bypass of a defective safety device:

This function should be set to "Yes" if the connected safety device is out of order. The signal of the defective safety device is ignored. The bypass-function permits to operate the door in the deadman function until the safety device has been repaired.

INSTRUCTIONS FOR MAKING ADJUSTMENTS TO THE DOOR VIA CONTROLLER

We preset all of the parameters in the factory prior to shipping your door. However, there are times when some adjustments must be made once the door has been installed, such as opening & closing speeds and the door's four positions (closed, crawl closed, crawl open, & open). All adjustments are easily made by pressing the keys on the keypad located on the front of the controller.

The parameter sheet in your instructions contains all of the information and values for your door. At the top of the page you will find the date that the system was set up, our customer's name, the door size & type, and the serial numbers for the door, controller and motor. These serial numbers are recorded to help keep track of your system and its values. If you experience any problems with your door or if you are having trouble making adjustments, these numbers can be used for reference when you call our customer support (1.800.877.2255). The parameters, located below this information, contains the menus which are set up in the same order as in the system itself.

To adjust speeds:

WARNING: Never make any adjustments when the door is moving!

01. Press "ENT" ("Basic Settings?" appears on screen)
02. Press "ENT" ("Enter Password Please" appears on screen)
03. Enter your password by using the arrow up key until you reach your password number
04. Press "ENT" ("Set Control Functions?" appears on screen)
05. Press arrow down key once ("Motor Adjustment?" appears on screen)
06. Press "ENT" ("Adjust Nom. Motor Power:" appears on screen)
07. Press arrow down key once ("Opening Speed" appears on screen)
08. Press "ENT" (the set value will start flashing)

09. Press arrow up key to increase door opening speed or arrow down key to decrease door speed (MAKE SURE THAT YOU INCREASE DOOR SPEED IN SMALL INCREMENTS!)
10. Press "ENT" (the value that you selected will stop flashing)
11. Press arrow down key once ("Closing Speed" appears on screen)
12. Repeat steps 8-10
13. Press arrow down key once ("Crawling Speed" appears on screen)
14. Repeat steps 8-10
15. Press arrow down key once ("Soft Start (In Opening)" appears on screen)
16. Repeat steps 8-10
17. Press arrow down key once ("Soft Start (In Closing)" appears on screen)
18. Repeat steps 8-10
19. Press arrow down key once ("Quick Stop" appears on screen)
20. Repeat steps 8-10
21. Press "ESC" 3 times ("Power On/System OK" appears on screen)

To adjust the positions of the door:

WARNING: Never make any adjustments when the door is moving!

01. Press "ENT" ("Basic Settings?" appears on screen)
02. Press "ENT" ("Enter Password Please" appears on screen)
03. Enter your password by using the arrow up key until you reach your password number
04. Press "ENT" ("Set Control Functions?" appears on screen)
05. Press arrow down key 2 times ("Adjust Door Limit Encoder Values?" appears on

screen)

06. Press "ENT" ("Modify Limit Value Pos. Open:" appears on screen)

07. Press "ENT" (the set value will start flashing)

08. Press arrow up key to lengthen door open position or arrow down key to shorten door open position (MAKE SURE THAT YOU INCREASE OR DECREASE USING SMALL INCREMENTS! EACH INCREMENT IS APPROXIMATELY 1/4")

09. Press "ENT" (the value that you selected will stop flashing)

10. Press "ESC" ("Adjust Door Limit Encoder Values?" appears on screen)

11. Press arrow up key 2 times ("Set Control Functions?" appears on screen)

12. Press "ENT" ("Open Control: Dead Man Function" appears on screen) Note: As a safety feature, the system will always default back to "Dead Man Function" whenever a change is made to any door position.

13. Press "ENT" ("Dead Man Function" will start flashing)

14. Press arrow down key 2 times ("Altern. Open/Close" appears on screen)

15. Press "ENT" (the value that you selected will stop flashing)

16. Press "ESC" ("Set Control Functions?" appears on screen)

17. Press arrow down key 2 times ("Adjust Door Limit Encoder Values?" appears on screen)

18. Press "ENT" ("Modify Limit Value Pos. Open:" appears on screen)

19. Press arrow down key once ("Modify Limit Value Pos. Crawl Open:" appears on screen)

20. Press "ENT" (the set value will start flashing)

21. Press arrow up key to shorten door crawl open position or arrow down key to lengthen door crawl open position (MAKE SURE THAT YOU INCREASE OR DECREASE USING SMALL INCREMENTS! EACH INCREMENT IS APPROXIMATELY 1/4")

22. Repeat steps 9-18

23. Press arrow down key 2 times ("Modify Limit Value Pos. Crawl Close:" appears on screen)

24. Press "ENT" (the set value will start flashing)

25. Press arrow up key to lengthen door crawl close position or arrow down key to shorten door crawl close position (MAKE SURE THAT YOU INCREASE OR DECREASE USING SMALL INCREMENTS! EACH INCREMENT IS APPROXIMATELY 1/4")

26. Repeat steps 9-18

27. Press arrow down key 3 times ("Modify Limit Value Pos. Close:" appears on screen)

28. Press "ENT" (the set value will start flashing)

29. Press arrow up key to shorten door close position or arrow down key to lengthen door close position (MAKE SURE THAT YOU INCREASE OR DECREASE USING SMALL INCREMENTS! EACH INCREMENT IS APPROXIMATELY 1/4")

30. Repeat steps 9-16

31. Press "ESC" 2 times ("Power On/System OK" appears on screen)

To select a new password:

01. Press "ENT" ("Basic Settings?" appears on screen)

02. Press arrow down key once ("Special Functions?" appears on screen)

03. Press "ENT" ("Enter Password Please:" appears on screen)

04. Press "ENT" ("Set Relay-Contact K1" appears on screen)

05. Press arrow down key 4 times ("Select New Password?" appears on screen)

06. Press "ENT" ("Enter Password, Please:" appears on screen & "0000" will start flashing)

07. Press arrow up key to select a new password

08. Press "ENT" ("Select New Password?" appears on screen)

09. Press "ESC" 2 times ("Power On/System OK" appears on screen)

DATE _____		DOOR S/N _____		
CUSTOMER _____		CONTROLLER S/N _____		
DOOR SIZE _____		MOTOR S/N _____		
MENU LEVEL 1	MENU LEVEL 2	MENU LEVEL 3 <DEFAULT SETTINGS>	SELECTION TABLE FOR LEVEL 3	YOUR VALUE
MAIN MENU: BASIC SETTINGS?	SET CONTROL FUNCTIONS?	OPEN CONTROL <DEAD MAN FUNCTION>	-DEAD MAN FUNCTION -PUSH TRAVEL -ENTER, OPEN/CLOSE	
		CLOSE CONTROL <DEAD MAN FUNCTION>	-DEAD MAN FUNCTION -CALL TRAVEL	
		AUTOMATIC CLOSING <OFF>	-ON -OFF	
		TRIP LOCK TIME FOR ADJ (TO CLOSE) <45s>	0...999s	0
		MOTOR TIME PARTIAL OPENING <6s>	2...99s	1
	MOTOR ADJUSTMENT?	ADJUST NOMINAL MOTOR POWER <250W>	50...370 W	370
		OPENING SPEED <07s>	5...250% (100% = 50 Hz)	
		CLOSING SPEED <07s>	5...250% (100% = 50 Hz)	
		CRAWLING SPEED <02s>	5...80% (60% = 30 Hz)	
		SOFT START (IN OPENING) 1(HARD)...100(SOFT) <2s>	1...100	5
		SOFT START (IN CLOSING) 1(HARD)...100(SOFT) <2s>	1...100	5
		QUICK STOP: 1(HARD)...100(SOFT) <0s>	1...100	2
	ADJUST MAGNETIC BRAKE?	BRAKING METHOD: 0(HARD)...3(SOFT) <0>	0...9	0
	ADJUST DOOR LIMIT ENCODER VALUES?	MODIFY LIMIT VALUE POS. OPEN <XXXX>	000...999	
		MODIFY LIMIT VALUE POS. CRAWL OPEN <XXXX>	000...999	
MODIFY LIMIT VALUE POS. CRAWL CLOSE <XXXX>		000...999		
MODIFY LIMIT VALUE POS. CLOSE <XXXX>		000...999		
ADJUST SAFETY DEVICE?	SAFETY DEVICE CHAISE: -TEMPORARY STOP @ CLOSE	-TEMPORARY STOP @ CLOSE -PERMANENT STOP @ CLOSE -DOOR OPENING 2 SEC. -COMPLETE OPENING -STOP @ OPEN & CLOSE -STOP @ OPEN & CLOSE		
MAIN MENU: SPECIAL FUNCTIONS	SET RELAY-CONTACT K1?	CONTACT K1 ACTION ON: <LEACH DOOR MOTION>	-RELEASE TO OPENING -OPENING MOTION -CLOSING MOTION -DOOR COMPLETE OPEN -DOOR COMPLETE CLOSED	
		K1-TIME BEFORE DOOR MOTION <0>	0...99s	0
		OPERATION OF K1: <MAINTAINED CONTACT>	-MAINTAINED CONTACT -PULSE 1 SEC. -PULSE 5 SEC. -FLASHING CONTACT	
	RESTORE DEFAULT CONFIGURATION?	ARE YOU SURE? THEN PRESS ENT		
	BYPASS DEFECTIVE SAFETY DEVICE <NO>		-NO -YES	
	SELECT OPERATING LANGUAGE?	OPERATING LANGUAGE: <DEUTSCH>	-DEUTSCH -ITALIANO -ENGLISH -FRANCAIS -ESPANOL	
	SELECT NEW PASSWORD?	PLEASE ENTER NEW PASSWORD: <XXXX>	0000...9999	
MAIN MENU: DIAGNOSTICS	OVERVIEW OF CONTROL UNIT STATUS	A S Z P G C O U V W P L K X0X X0X X0X X0X X0X PLEASE WAIT, SELF-TEST RUNNING!!		
MAIN MENU: STATISTICS?	PERFORM SELF-TEST?			
	OPENING CYCLES TOTAL			
	CLOSING CYCLES TOTAL			
	DOOR STOPS WHILE OPENING			
	DOOR STOPS WHILE CLOSING			
	SAFETY DEVICE TRIPS TOTAL			
	OPERATING HOURS TOTAL			
MAIN MENU: SYSTEM INFO?	MOTOR OPERATING TIME			
	MOTOR OVERLOADS TOTAL			
	SYSTEM START-UPS TOTAL			
	WATCHDOG-RELEASES			
	SOFTWARE-RELEASES			
MAIN MENU: SERVICE HOTLINE?	SERIAL NO			
	TELEPHONE # / FAX #			
	OF REPRESENTATIVES			

III. Diagnostics/Error Correction

The "Diagnostics" part of the menu helps to locate errors fast and without problems, and to check the correct connections of switches, etc. This also allows an effective support from our service hotline as it permits to look systematically for errors.

III/1 Integrated diagnostic function "Overview of Control Unit Status"

In the upper row of the display, letters are shown whose significance is explained on the following page. The column "Indication of possible mistakes" gives examples of errors that could be indicated by this letter. Of course the status letters will be shown also, when corresponding switch/device is just actuated normally (e.g. "A" when the switch "OPEN" is pressed.)

The 5 figures shown in the lower row of the display have the following significance:

Adjusted encoder value "Door Closed"

Adjusted encoder value "Position Crawl Close"

Adjusted encoder value "Position Crawl Open"

Adjusted encoder value "Door Open"

Present encoder value (= actual position of the door)

XXX XXX XXX XXX XXX

If the encoder values set for the positions "Door Closed", "Crawl Close", "Crawl Open", and "Door Open" are faulty (e.g. value of "Door Closed" is higher than in "Door Open"), the door might not move. ATTENTION: If the encoder has not yet been adjusted, wrong values may be shown.

III/2 Further error messages

The message "SYSTEM ERROR" in the display indicates that the microprocessor has located a grave error in the control system. Please check whether this problem is solved by pressing the "ESC" key. If the problem is not solved, then briefly switch off the power supply of the control system and then re-boot it. If this does not work, please call 1-800-877-2255.

III/3 Service

In the operating menu "Service Hotline", you will find the telephone numbers and addresses of our facilities. Please do not hesitate to call if you have any questions.

IV. Overview of control unit status

Status letter	Indicated when...	Terminals	Type of contact	Indication of possible mistakes
A	...the switch "OPEN" is pressed	X5: 1/2	make (NO)	If the letter is shown all of the time, check whether the type of contact is correct or whether instead of a "make" contact, there is a "break" contact.
S	...the switch "STOP" is pressed	X5: 3/4	break (NC)	
Z	...the switch "CLOSE" is pressed	X5: 5/6	make (NO)	
P	...the switch "Part. Open" is pressed	X5: 7/8	make (NO)	
G	...the limit switch "Door Closed" is actuated	X5: 9/10	break (NC)	If the letter is shown all of the time, check whether the type of contact is correct or whether the limit switch is not fixed correctly and is actuated all of the time.
C	...the limit switch "Crawling Speed Open" or "Crawling Speed Close" is actuated	X5: 11/12 or X5: 13/14	break (NC)	
O	...the limit switch "Door Open" is actuated	X5: 15/16	break (NC)	
U	...the encoder signals "Door Closed"	-	-	If the position of the door indicated in the display (U, V, W) does not correspond with the actual position of the door, the connection of the encoder might be faulty.
V	...the encoder signals "Crawling Speed Open" or "Crawling Speed Close"	-	-	
W	...the encoder signals "Door Open"	-	-	
F	reserved			
L	...the safety device (SHE) responds	X6: 27/29	break (NC)	If the letter is shown all of the time, check whether the safety device is installed correctly or whether it is out of order.
K	...the signal contact K1 is actuated	X3: 42/ 43/44	-	Set the relay contact K1 (Menu: Special Functions); check which function has been set.

V. Error Lists

ERROR 02: • The internal device for measuring the motor current may be defective (call customer service at the factory)

ERROR 04: • The door fails to complete the open or close cycle (re-adjust the door limits)

- The "Crawling Speed" is set too low (raise the "Crawling Speed")
- No door movement (check wiring connections of all control stations)
- A wire between controller & Positioning Control System is broken or not connected (check for broken or disconnected wire)
- Motor is wired opposite of the Positioning Control System (re-wire properly)
- Controller is not connected to the motor (connect controller to motor)

ERROR 10: • External Device output does not maintain 24 volts (check wiring)

- Possible component failure within power supply (call customer service at the factory)

MOTOR OVERLOAD: • Improper voltage (check voltage)

- Door has hit an object (remove the obstruction & press "ESC" on the keypad)

- Door not moving freely (adjust the door to minimize friction & press "ESC" on the keypad)
- Very large doors or doors located in freezers (increase the "Soft Start" settings)

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