MANUAL DOOR CONTROL DC 1500   SWV-039

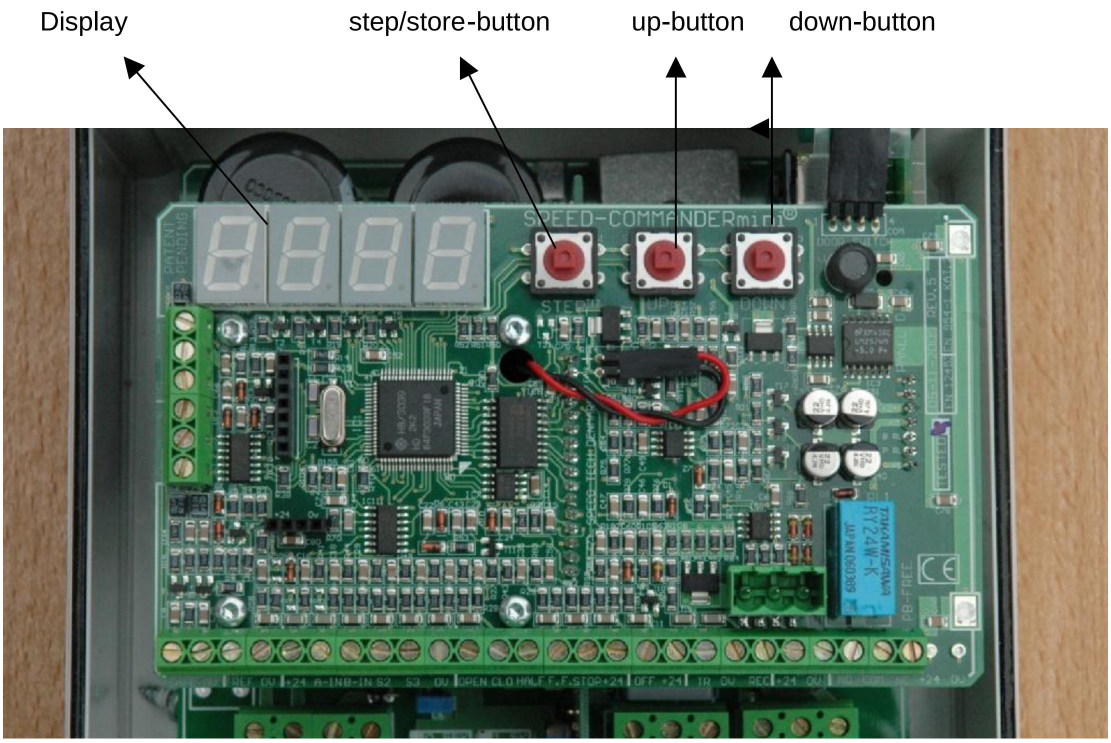
1 Contents

2. Product overview

The Door Control has been designed to open and close doors. The control system communicates with an encoder in the electric motor. The door can be set in the required position by means of parameters, and the speed, half-open position, opening and closing force as well as various other functions, can be programmed-in. For a complete overview of the parameters see Chapter 4.

On the circuit board, you will see 3 push buttons. Each of these buttons have a function, namely:

- **Step/store button** enables you to step through the list of parameters and set changes. To exit the list of parameters, press and hold this button for 3 seconds. The parameters will be shown in green on the display.
- **Up and down button** enables you to change the value of the selected parameter. After exiting the list of parameters, changes can be definitively saved by pressing and holding the up and down buttons simultaneously for 10 seconds. The operation automatically starts-up again and the changes are saved. The up and down buttons are also used for programming the correct door positions. The value of the parameters will be shown in red on the display. .



The encoder gives off pulses per rotation of the motor. The control counts these pulses and accordingly determines the position of the door. To do this, the control needs to be pre-programmed with what to do with each number of pulses.

When a MIG encoder is used, first of all, the point of reference needs to be established. This is the zero point from where the control begins to count the pulses. It is from this point of reference that: the ‘door closed’, ‘collision safeguard switched-off’, ‘accelerate’, ‘open position’ and ‘personnel entrance’ positions, are determined. During normal operation, these positions are shown on the display as numbers. For example, the open position is 12837. This means that the control has counted 12837 pulses from the zero point and, at that moment, the open position has been reached.

The point of reference can be set in two different ways:
- By a mechanical block horizontally sliding doors
- By using and end switch NPN-NC, used at vertical sliding doors

Firstly, following a power failure, the door will slowly look for the point of reference (after any command), in order to move from there to the required position.

Also absolute encoders are being used at motors from Tornado or MFZ. These encoders do not us a reference point and therefore do not need to seek for the reference point after a power failure.

The control has 54 programmable parameters. Many of these can remain as set by the manufacturer. The parameters are shown as numbers (1- 9) and letters (A-K). Other differences between the parameters are illustrated by permanently showing the letters or numbers, either flashing or fast-flashing. This is represented in the manual as follows:
- A (‘A’ shown permanently)
- A* (‘A’ slowly flashing)
- A** (‘A’ quickly flashing)

In addition to this functionality, the following settings (among others) can be programmed:
- Automatic closing with variable time
- Various relay exits for switching components such as traffic lights, warning signals or an engine breakdown.
- Connection to fire detector centre
- Electrical engine is provided with a base current, so that it can be warmed during deep-freeze conditions.
- Activate break-resistance as heat provider when control is fitted in a cold environment.

Safety components

The Door Control can be connected to various safety components. Light weight door scan do without any. The system detects a blockade by itslef and the door will open. Heavier doorswill be equipped with a 8k2 ohm safety frame or photocell safeguard. Due to an advanced measuring process, the control is able to detect obstacles. In such a case, the door will stop and then move in the opposite direction. The force with which the Door Control reacts is adjustable. In order to comply with the guidelines, we would advise you to mount an extra safety component on the door, so that it complies with the guidelines in force within the Construction Regulations.

3. Making operational

General:

In order to programme the control correctly, the following conditions need to be adhered to:

- All the drive components, such as the motor, reverse wheel, safety components, drive belt and transporter must be assembled in accordance with the rules.
- the control cabinet must be assembled in accordance with the rules
- the impulse providers, encoder and electro-motor must be assembled and connected at the correct position in conformance with the drawing.
- the mains voltage agrees with the indication shown on the type-plate of the control cabinet

In order to operate correctly, you need to clearly differentiate between the terms 'up and down buttons' and 'open and close buttons'. The former applies to the circuit board and the latter applies to the cover. By pressing the step/store button, you can view the parameter settings. When you want to exit the parameter list, push and hold the step/store button for three seconds. The display again shows the actual value of the encoder or potential fault codes.

Checking rotation direction of motor and encoder:

Connect to the mains voltage. The control will start up and show a number of values on the display, such as power, type of operation and programme number.

Step 1: Start position
Slide the door manually to the middle position.

Step 2: Control rotation direction of motor
Check the rotation direction of the motor and encoder by pressing and holding the open switch on **the cover**. The door should now open and count-up the encoder value on the display. It could occur that the door closes and/or the encoder value counts down. If so, check that the operation has been set up correctly.

Programming positions:

1: Horizontally sliding, MIG encoder, reference point by mechanical block

Using the step/store button, release the programme by setting J at value 7 and confirm this with the step/store button. Then set the value at 5 and once again confirm this by pressing step/store. **Opn** will now appear on the display. Next, guide the door using the up-button until the desired open position has been reached (**Note**: do not let it touch the buffer) otherwise close it a little using the down-button. Then press step/store, and **CLo** will subsequently appear on the display. Now, close the door using the down-button until it is completely shut (**Note:** do not let it touch the buffer) otherwise open it a little with the up-button. Then press step/store. **Ref** will now be displayed. Subsequently, press 'open' on the **foil keys on the cover**, and the door will open and bump into the buffer. The door is now ready to be tested. Let the door open and close again and test the safety devices such as the collision safeguard and the photoelectric cell (where present). If everything is functioning correctly, simultaneously press the up and down buttons until the operation restarts. The parameters are now fixed and the door can be used.

2: Vertically sliding, Kostal encoder (MFZ or Tornado motor)

Using the step/store button, release the programme by setting J at value 7 and confirm this with the step/store button. Then set the value at 5 and once again confirm this by pressing step/store. **Opn** will now appear on the display. Next, guide the door using the up-button until the desired open position has been reached. Then press step/store, and **CLo** will subsequently appear on the display. Now, close the door using the down-button until it is completely shut. Then press step/store.Setting a reference position is not necessary. The door is now ready to be tested. Let the door open and close again and test the safety devices such as the collision safeguard and the photoelectric cell (where present). If everything is functioning correctly, simultaneously press the up and down buttons until the operation restarts. The parameters are now fixed and the door can be used

3: Horizontally sliding, MIG encoder, NPN-NC end switch

Using the step/store button, release the programme by setting J at value 7 and confirm this with the step/store button. Then set the value at 5 and once again confirm this by pressing step/store. **Opn** will now appear on the display. Next, guide the door using the up-button until the desired open position has been reached (**Note**: do not let it touch the buffer) otherwise close it a little using the down-button. Then press step/store, and **CLo** will subsequently appear on the display. Now, close the door using the down-button until it is completely shut (**Note:** do not let it touch the buffer) otherwise open it a little with the up-button. Then press step/store. **Ref** will now be displayed. Subsequently, press ‘open’ on the **foil keys on the cover**, and the door will open till the switch “position close” is switched off. The door is now ready to be tested. Let the door open and close again and test the safety devices such as the collision safeguard and the photoelectric cell (where present). If everything is functioning correctly, simultaneously press the up and down buttons until the operation restarts. The parameters are now fixed and the door can be used

2: Optional adjustments to the personnel entrance (position “half open” parameter 3*)

It is recommended to use a photoelectric cell safety device.
Connect a NO contact to the terminal block at 13 and 16 and test the half-open position.
If the opening is not sufficient, this can be altered in the following way:
Go to parameter J and set this at 7 utilising the up/down button; then press step/store.
Press step/store once again and go to parameter 3*
Using the up or down button, guide the door to the desired personnel entrance position. Fix the position by briefly pressing the step/store button. Press the step/store button again and keep holding it until you are out of the parameters/menu.
Next, simultaneously press the up and down buttons in order to restart the door control.
Let the door carry out the reference run and re-test your personnel entrance once again.
The door will automatically close the personnel entrance after 3 seconds.

Programming automatic closure

ATTENTION! Setting up automatic closure may only be carried out in combination with an installed and connected photoelectric cell safety device.
Changing this parameter doesn’t do anything if an automatically closing door has not been delivered.
Using the step/store button, go to parameter 5* and, with the aid of the up and down buttons, key in the desired time for the door to automatically close. The values are represented in seconds.
Next, confirm with the step/store button and then press step/store again and keep holding it until you are out of the parameter list.
Then simultaneously press the up and down buttons in order to restart the door control.
Now, by pressing close on the lid, the door will make a reference run.
If you now open the door, it will close automatically.
When crossing the photoelectric cell, the time set in parameter 5* will start running.
The door will automatically close when the time stands at ‘0’.
When crossing the photoelectric cell or if the collision safeguard is pressed, the door will reverse direction. The time set in parameter 5* will start running again.

4. Overview of parameters and altering parameter settings

Par.	Function	Value	Def.	Comments
1	Frequency 1	0,5-150 Hz		Open speed between P0-P4
2	Frequency 2	0,5-100 Hz		Close speed between P4-P2
3	Frequency 3	0,5-100 Hz		Speed between P2-P0
4	Timer 1	0-999sec		Automatic close timer without operating the photocell
5	Timer 2	0-999sec		Pre-warning timer
6	Timer 3	0-999sec		(Traffic) Lighting timer switch off
7	Acceleration	0,1-250Hz/sec		Acceleration when opening
8	Acceleration	0,1-100Hz/sec		Acceleration when closing
9	Brake-time 1	0,1-100Hz/sec		Brake-time for open or close command
A	V/F ratio	10,0-100Hz		Voltage/Frequency characteristic
B	Boost	0,0-100%		Boost voltage when starting-up
C	Number of revolutions	300-3000		Motor revolutions at 50Hz
D	Encoder	1,0-1000		Number of pulses per rotation
E	Tolerance	1-999		Tolerance open and close position
F	Tolerance	1-999		Tolerance potential free relays
G	Brake-time 2	Max 999Hz/sec		Brake-time photocell or stop button
H	Brake-time 3	Max 999Hz/sec		Brake-time collision safety
J	Optional control	1-4	1	See Programming paragraph
0*	Position p0	-32000/32000		Position close door
1*	Position p1	0-32000		Position collision safety switch off
2*	Position p2	0-32000		Position open and close slow down
3*	Position p3	0-32000		Position personnel entrance
4*	Position p4	0-32000		Position open door
5*	Timer 4	0,0-999sec		Automatic close timer after operating the photocell
6*	Timer 5	0,0-999sec		Duration restriction
7*	Function timer 1	1-7	1	Multiple programmable timer
8*	Function timer 2	1-7	2	Multiple programmable timer
9*	Function timer 3	1-7	5	Multiple programmable timer
A*	Function timer 4	1-7	9	Multiple programmable timer
B*	Power relay contact COM-NO	1-15,16, 17		- 1, function relay K0 - 15, relay high with door open - 16, relay high with door close - 19, traffic light function
C*	Relay k1 contact 24-25	1-15,16, 17		- 1, function relay K0 - 15, relay high with door open - 16, relay high with door close
D*	Not available			
E*	Power setting close	10,0-100Hz		Force when closing (slip detection)
F*	Boost	0-100%		Force when starting-up
G*	Speed	0,5-25Hz		Speed emergency control
H*	DC brake	0,0-25%		Power strength DC brake
J*	DC brake	1-100s		Time DC brake
0**	Display	0-13	0	Reproduce settings on display
1**	Fault analysis	0-or fault code		Fault reporting on display
2**	Rotation direction	0-1		- 0=rotation direction motor - 1=reverse rotation motor - 2=reverse direction encoder - 3=reverse direction rotation motor and encoder
3**	Engine noise	2,0-8,0kHz	5,0	Reducing the engine noise
4**	Frequency p4	0,50-10Hz		Minimum frequency when

				opening/closing
5**	Counter	0-320.00		Number of door movements x 10
6**	Photocells	0-1	1	Safety edge
7**	Safety edge	1-2-9	1	- 1= Bircher contact strip - 2= optic sensor - 9= same as 1 but only in opening direction
8**	Point of Reference	10, 9, 7		- 12= with limit switch (vertical lift door) - 10=MIG encoder (pos. close) - 9=absolute encoder - 7=MIG encoder (pos. open)
9**	Photocell	-32000/32000		Switched off position - Photocell
A**	Heating	0-50%		Setting heated switch cabinet
B**	V/F ratio	0-10		Voltage/Frequency characteristic
C**	Maintenance	0-320.00		Time-frame door maintenance
D**				
E**				
F**				
G**				

5. Fault reporting (power supply problems)

Code	Problem	Solution
UU	Electricity supply too low	Check electricity supply
OU	Electricity supply too high	- Check electricity supply - Deceleration value is too high - Use brake resistance
OH	Door Control is too hot	- Check position of controller. - The cabinet must not be placed in direct sunlight
OC1	Current too high, currently 190% too high.	Could be a mechanical problem
OC2	Current too high. Value is higher than 150% for 30 sec long.	Capacity of controller or motor is too low.
OC3	Current too high during acceleration	Acceleration value (par. 7) is too high, adjust this downwards.
OC4	Current too high during deceleration	Deceleration value (par. H*) too high, adjust this downwards.
OC5	Peak current too high	Short circuit in connection.
SO.5	Display value flashes	Nominal current is too high, controller capacity is too low.

6. Fault reporting and solving malfunctions (miscellaneous)

Code	Problem	Solution	Situation
E01	- Mechanical blockage - encoder defect	- Check mechanical parts - reset the error code with an open or close command - reset the control by taking off the voltage	Door stops and displays error code.
E02	Rotation Direction Encoder fault	Check value parameter 2**	Display shows this value when operating emergency control
E03	Encoder gives no pulses	Check encoder and connections	Display shows this value when operating emergency control
E04	Wrong direction	Direction to point of reference is not correct, see parameter 8**.	Stops and displays this error code
E05	Reference switch not working	Check the cabling and parameter 8**	Display shows this value when operating in dead-man's mode
E06	Incorrect reference switch position	- Position of switch has been moved, check endorsements – - Check operation NO/NC.	Display shows this value when operating in dead-man's mode
E07	Duration exceeded	- Mechanical blockage - value parameter B too low - value paramater 6* too low	Door stopps and shows error code
E08	Safety edge does not work during test	- Check spiral cord and connections - Check value parameter 7**	Controller switches to emergency control. Reset controller.
E09	Incorrect safety edge connection	- Check connections - Check spiral cord	Controller switches to emergency control. Reset controller.
E10	Safety edge in operation	- There is an obstacle, free-up sliding area - Check parameter 1* - Check connections - Check if the rubber in the profile is fitted correctly	Enter a new command after restoration
E12	Blockage detection	Overload in opening direction, check sliding direction for obstacles	Enter a new command after restoration
E13	Parameters blocked	Wrong password or password has not been entered	Enter password at parameter J

7. Terminal connection blocks

Code	Signal		Connection	Error
J09	Transmitter/receiver photocell	NC	09, normal 24V	Connect transmitter/receiver or place a bridge on 16/9
J11	Open	NO	11, normal 0V	Connection of this function
J12	Close	NO	12, normal 0V	Connection of this function
J13	Half-open	NO	13, normal 0V	Connection of this function
J14	Pull switch	NO	14, normal 0V	Connection of this function
J15	Stop	NC	15, normal 24V	Connection of this function
J17	Out	NC	17, normal 24V	Connection of this function
J19	Photocell transmitter		19	- Adjust and aim photocell - Check connections Connection of this function
J21	Photocell receiver		21	- Adjust and aim photocell - Check connections Connection of this function
REF	Setting point of reference		See this manual	Power supply disconnected
ABL	Fire alarm	NC	8, normal 24V	Check fire alarm signal

8. Technical information

Door Control

Model	Capacity	Current	Supply	Out. voltage	Fuse
SCD 750	0.75 kW	3 x 4A	230V	3 x 230V	13A
SCD 1500	1.5 kW	3 x 7A	230V	3 x 230V	16A
Supply voltage			12-24V		
Output signal			2 channels A and B, 90 degree shifted		

Encoder

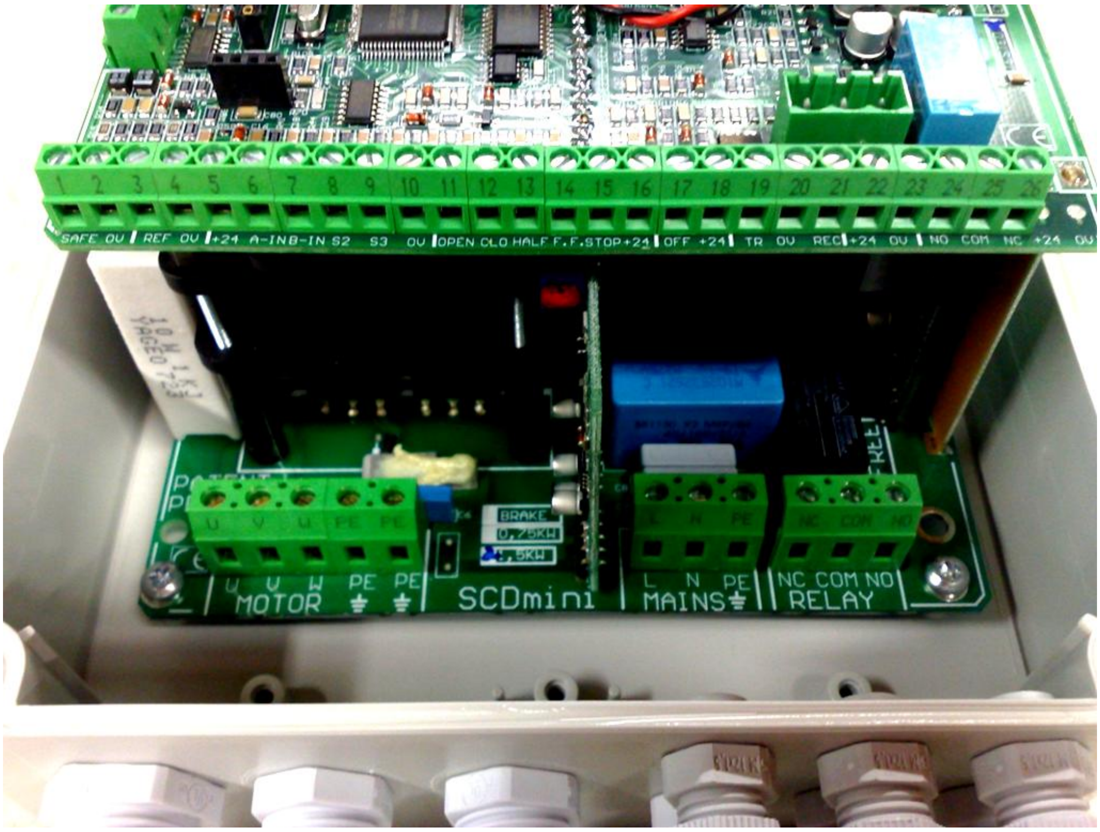
Signal strength	-high > 6V, U-low < 1,5V
Maximum frequency	0 kHz
Number of pulses per rotation	ependant upon application

Relay

Relay status	Left upper segment is green	Green dot in display
	K1 mini relay is active	K0 power relay is active

Relay

Model	Max. switch capacity	Function: stop light	Function: Lock	Function to adjust in parameter:
Mini relay	230 V / 25W	25 watt light bulb	COM-NO-NC	C*
Power relay	230 V / 120W	25 watt light bulb	COM-NO-NC	B*



9. Connecting and adjusting

Stop light function

	Max. switch capacity	Function to adjust in parameter:	Function parameter set at:
Mini relay	230 V / 25W	C*	15
Power relay	230 V / 120W	B*	19
Relay function		7*	1
Relay function		8*	4
Relay function		9*	5
Parameter		5*	Time to close from open position 0 – 999 sec
Parameter		5	Time from warning signal 0 – 999 sec
Parameter		6	Time for light to go out 0 – 999 sec
Flashing red light upon opening. When open, green light will burn and red is out. After ..secs, red light will flash as			
a pre--warning. Green light will then go out and red light will remain flashing as door is being closed.			
When the door is closed, red light will continue burning for ..secs and will then go out.			

Automatic closure function

	Function to adjust in parameter:	Parameter value
Relay function	7*	1 = standard
Relay function	A*	9 = standard
Parameter	4	Time for closing from open position without activating photocell 0 – 999 secs
Parameter	5*	Time for closing from open position after activating photocell 0 – 999sec
When fully open, the time set in parameter 4 will start running. Once '0' is reached, the door will close.		
However, the time set in parameter 5* will only start counting down once it has passed the photoelectric cell.		
As standard, parameter 4 is set at 20 secs. Parameter 5* can be altered by the customer.		

Display function

Display	Function to adjust in parameter:	Parameter value	Made visible in the display:
Parameter	0**	0	Counter value
		1	Motor ampere
		9	Boost to open
		12	The counter value is visible in between Opn and Clo,
		13	Nothing is visible between Opn and Clo

Relay function

Mini relay and Power relay	Parameter value:	Relay function
Function	1	Switches when speed is above 0 Hz
Function	2	Switches when speed is equal to 0 Hz
Function	12	Flashes when speed is above 0 Hz
Function	14	Switches when operating collision safeguard
Function	15	Switches when open
Function	16	Switches when closed
Function	18	Switches if not closed

Function	19	Flashes upon opening and closing and is constant when open Flashes as a pre-warning and burns constantly when closed for the time set in parameter 5
Function	20	Switches when closed and during opening motion.