



Electrical operating instructions

Door control panel TS 956

Software 1.1 - (Design and functions subject to change)



OPERATING INSTRUCTIONS

	Page
SAFETY DIRECTIONS	4
INSTALLATION ADVICE	6
INSTALLATION OVERVIEW	7
ENCLOSURE INSTALLATION	8
CONNECTING THE CONTROL AND THE ELEKTROMATEN®	8
LIMIT SWITCH CONNECTION	9
Plug - in system	9
Terminal version (until year 1997)	10
MAINS SUPPLY	11
MOTOR CONNECTION (internal wiring)	12
PHASE ROTATION	12
LIMIT SWITCH - ADJUSTMENT	13
HARDWARE OVERVIEW	14
WIRING DIAGRAM	15
CONTROL PROGRAMMING	16
Operating mode	17
Functions	17
Maintenance cycle counter	17
MEMORY CHECK	17
SAFETY DEVICES	18
Mounting the spiral cable	18
Emergency stop X3	18

	Page
FUNCTION DESCRIPTION	18
Internal push button / Three push button / Key switch X5	18
Fully closed control.....	18
Potential free changeover contact X9	19
Maintenance cycle counter.....	19
Short circuit / overload monitor.....	19
OPERATING STATUS DISPLAY	20
TECHNICAL DATA.....	21
LIFETIME / DOORCYKLES	22
DECLARATION OF INCORPORATION.....	23
FUNCTION OVERVIEW	24

SAFETY DIRECTIONS

Basic Directions

This control has been built in accordance with **EN 12453 Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements**; and left the factory in perfect condition from the point of view of safety. To maintain this condition and to ensure safe operation, the user must observe all the directions and warnings contained in these operating instructions.

In principle, only trained electrical craftsmen should work on electrical equipment. They must assess the work which has been assigned to them, identify potential danger sources and take suitable safety precautions.

Reconstruction of or changes to ELEKTROMATEN® are only permissible with the approval of the manufacturer. Original replacement parts and accessories authorised by the manufacturer guarantee safety. Liability ceases to apply if other parts are used.

The operational safety of an ELEKTROMATEN® is only guaranteed if it is used in accordance with the regulations. The limiting values stated in the technical data should not be exceeded under any circumstances (see corresponding sections of the operating instructions).

Safety Regulations

During the installation, initial operation, maintenance and testing of the ELEKTROMATEN®, it is necessary to observe the safety and accident-prevention regulations valid for the specific application.

In particular, you should observe the following regulations (this list is not exhaustive):

European normativ

- EN 12453
Safety in use of power operated doors - Requirements
- EN 12445
Safety in use of power operated doors - Test methods

Please check normative´s bellow.

VDE-regulations

- EN 418
Safety machinery
Emergency stop equipment functional aspects
Principles for design
- EN 60204-1 / VDE 0113-1
Safety of machinery - Electrical equipment of machines - Part 1:
General requirements
- EN 60335-1 / VDE 0700-1
Safety of household and similar electrical appliances - Part 1:
General requirements



Regulations

- Please ensure that the local regulations relating to the Safety of Operations of Doors are followed

SAFETY DIRECTIONS

Explanation of warnings

These operating instructions contain directions which are important for using the ELEKTROMATEN® appropriately and safely.

The individual directions have the following meaning:



DANGER

This indicates danger to the life and health of the user if the appropriate precautions are not taken.



CAUTION

This warns that the ELEKTROMATEN® or other materials may be damaged if the appropriate precautions are not taken.

General warnings and safety precautions

The following warnings are to be understood as a general guideline for working with the ELEKTROMATEN® in conjunction with other devices. These directions must be observed strictly during installation and operation.



Check that all screw connections are secure before operating the control and adjusting the limit switches.



- Please observe the safety and accident prevention regulations valid for the specific application. The installation of the ELEKTROMATEN®, the opening of covers or lids and electrical connection must be carried out when the supply is switched off.
- The ELEKTROMATEN® must be installed with the authorised coverings and protective devices. Care should be taken that any seals are fitted correctly and screw couplings are tightened correctly.
- In the case of ELEKTROMATEN® with a permanent mains connection, an all-pole main switch with appropriate back-up fuse must be provided.
- Check live cables and conductors regularly for insulation faults or breakages. When a fault is detected in the cabling, the defective cabling should be replaced after immediately switching off the mains supply.
- Before starting operation, check whether the permissible mains voltage range of the devices corresponds to the local mains voltage.
- With three – phase motor connection it must have right phase rotation

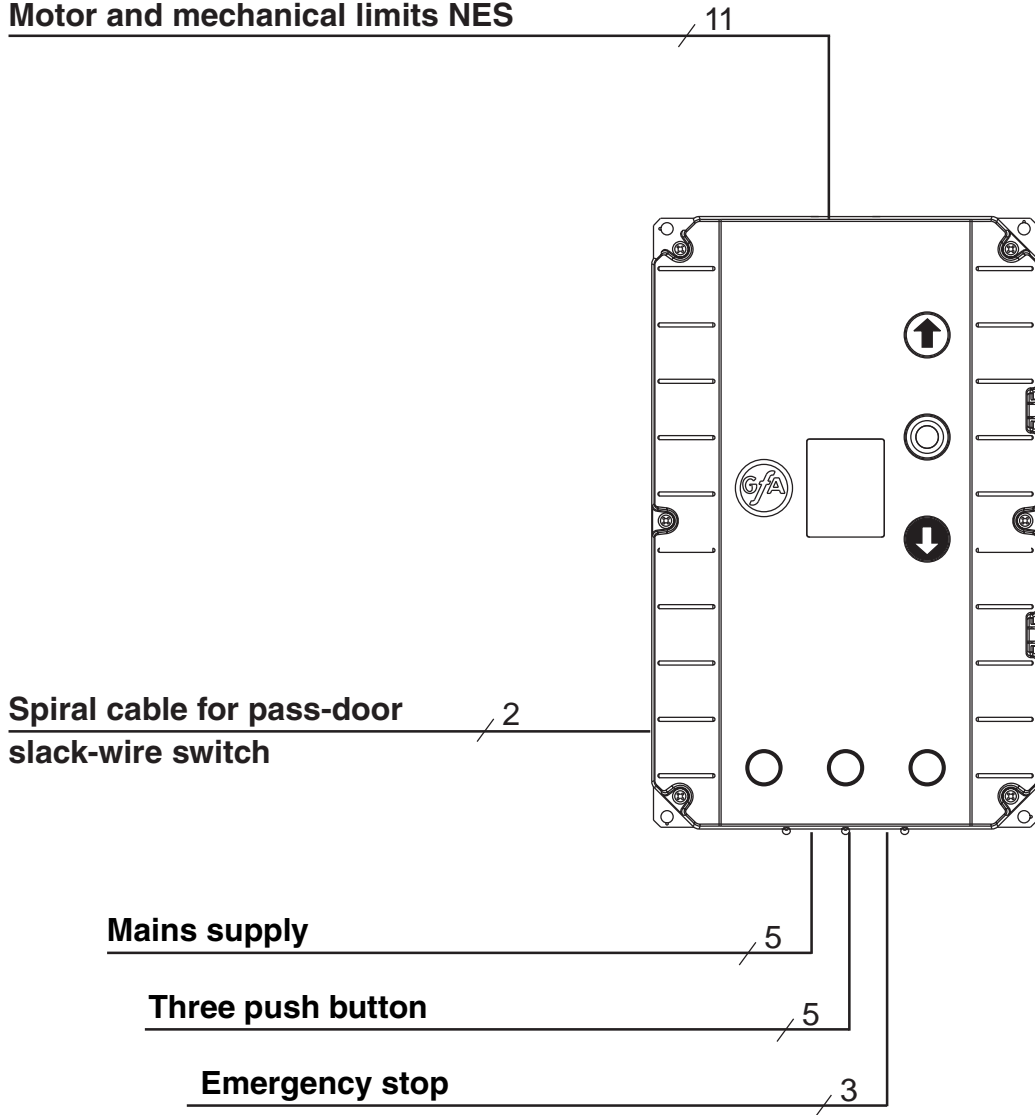
INSTALLATION OVERVIEW



Important!

Using the connection cable out side the building is not permitted.

**Connection cable ELEKTROMAT® for
Motor and mechanical limits NES**



 () Number of cores in the cable

ENCLOSURE INSTALLATION

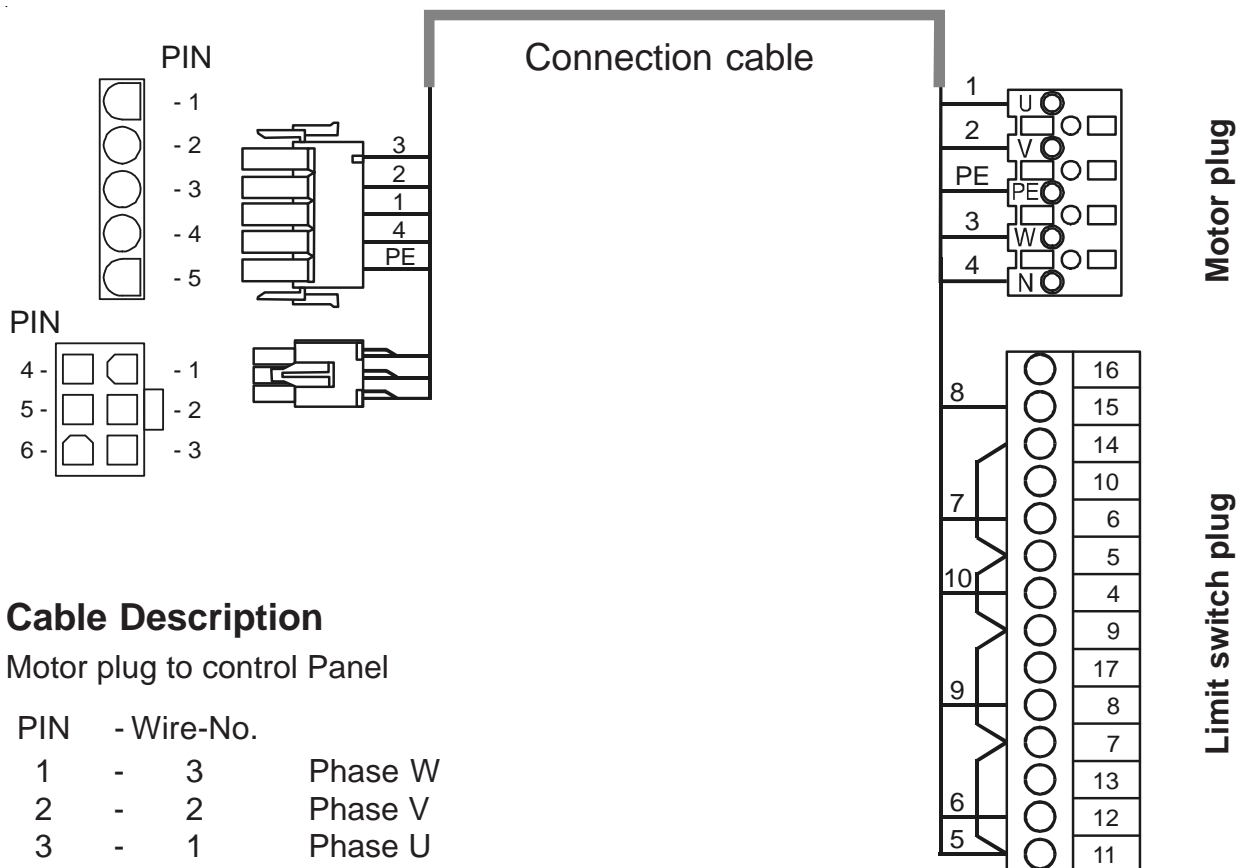
Before mounting the enclosure, the surface has to be checked for flatness, slope and freedom from vibrations. Mounting must be vertical. It is important that the door can be clearly seen from the position of the control through-out its travel.

CONNECTING THE CONTROL AND THE ELEKTROMATEN®

After the drive and control are fitted they can be connected with a plug-in cable. The cable has plugs on each end and for easy fitting. The plugs for motor and control panel are different and cannot be interchanged.

Control panel TS 956

ELEKTROMAT®



Cable Description

Motor plug to control Panel

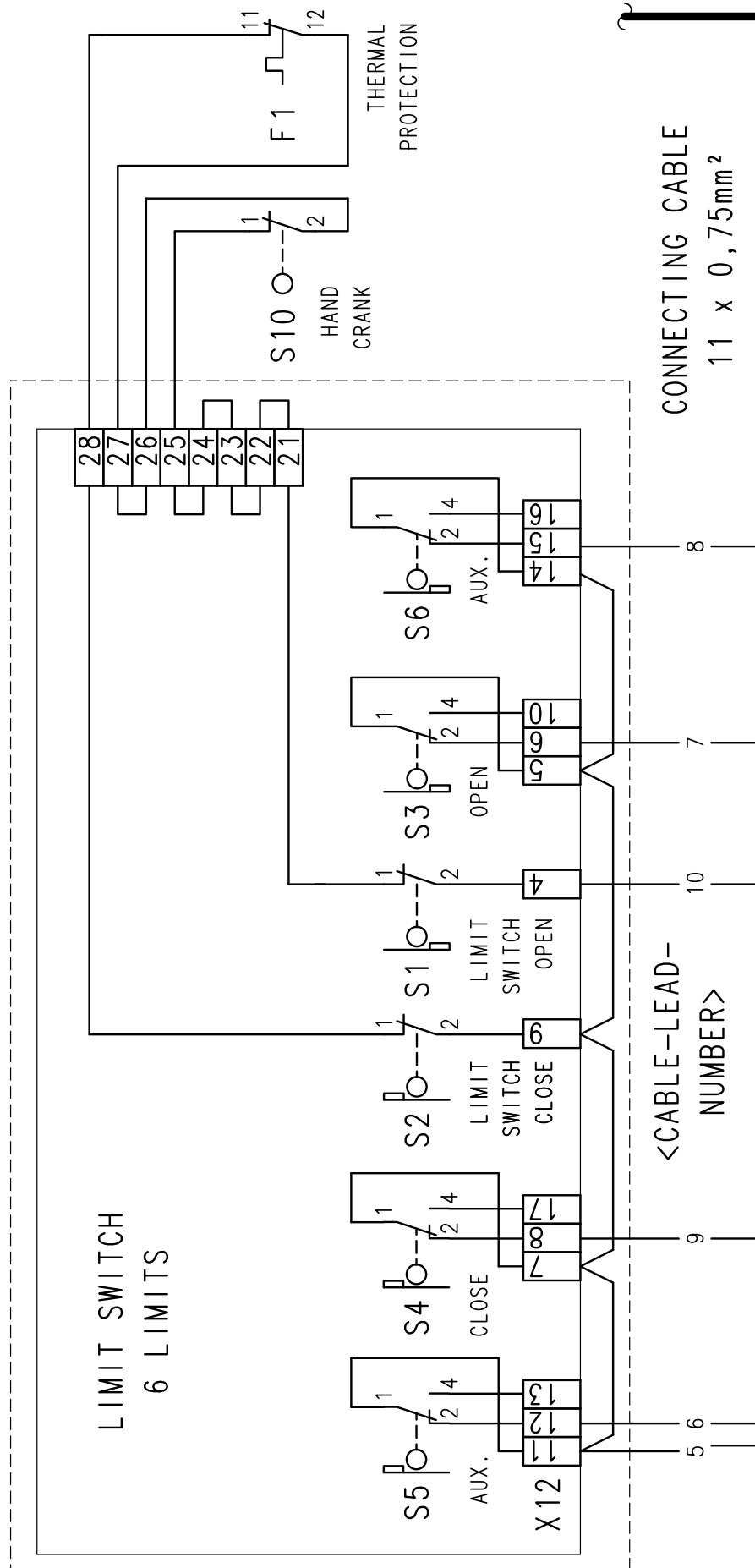
PIN	-	Wire-No.	
1	-	3	Phase W
2	-	2	Phase V
3	-	1	Phase U
4	-	4	Neutral (N)
5	-	PE	Earth

Limit switch plug to control panel

PIN	-	Wire-No.	
1	-	5	supply + 24V
2	-	6	S 5 aux. limit for fully closed control only
3	-	7	open - limit
4	-	8	S 6 aux. limit potential-free relaiscontact
5	-	9	close limit
6	-	10	safety circuit common limit

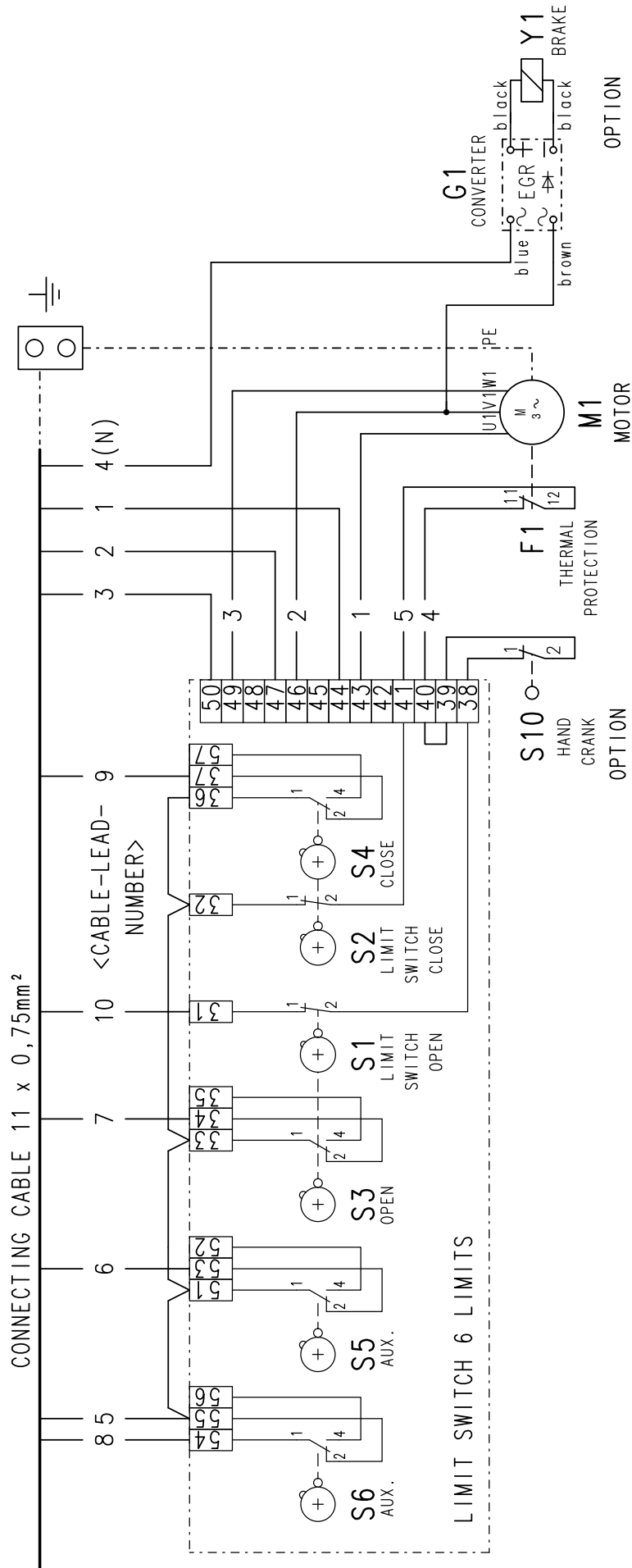
LIMIT SWITCH CONNECTION

Plug - in system



LIMIT SWITCH CONNECTION

Terminal version (until year 1997)



MAINS SUPPLY



DANGER! To the life and health thru electric shock.
Before mounting the mains supply must be switched OFF.



Important note!
The bridge must be fitted into the right terminal otherwise the print could be destroyed.



External fuse!
Control must be saved against short circuit and overload by an external fuse, max. 10A delayed, in the mains supply. An automatic cut off switch is required, regarding the supply for three-phase or single-phase.

When connecting control to mains supply a mains isolator switch or (16A CEE – plug) according EN 12453 is required.

The supply disconnect device (Main switch or CEE plug) must be installed between 0,6m and 1,7m above floor level.

The CONTROL PANEL TS 956 has a universal electric supply and works with the following supplies. (See diagram Fig.1-5)

Mains supply terminal

Fig.: 1

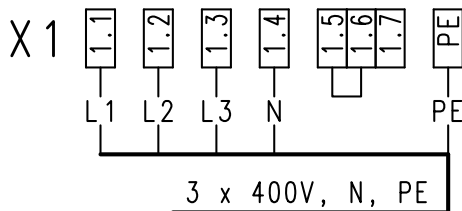


Fig.: 4

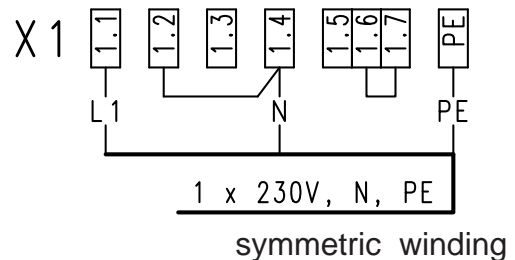


Fig.: 2

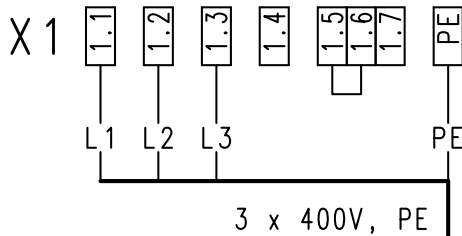


Fig.: 5

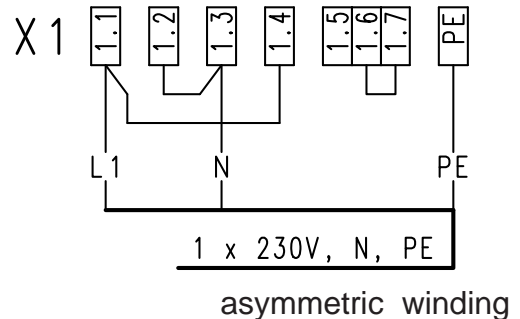
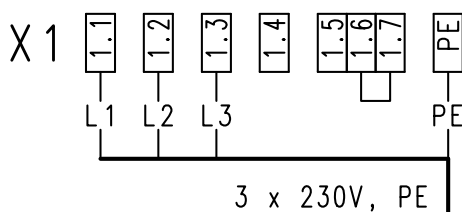


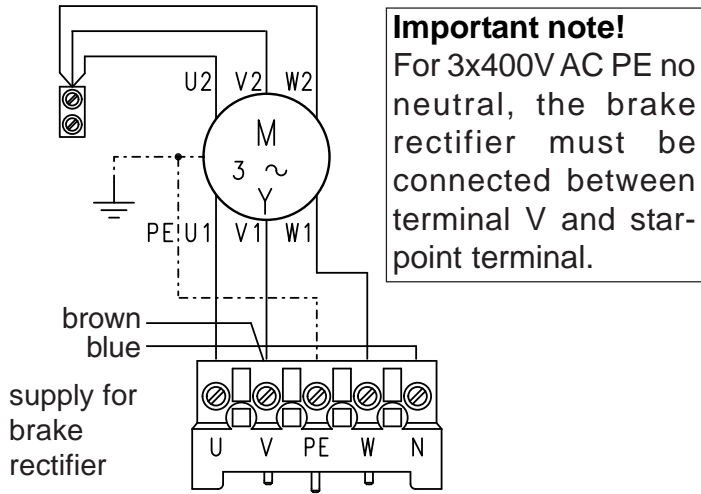
Fig.: 3



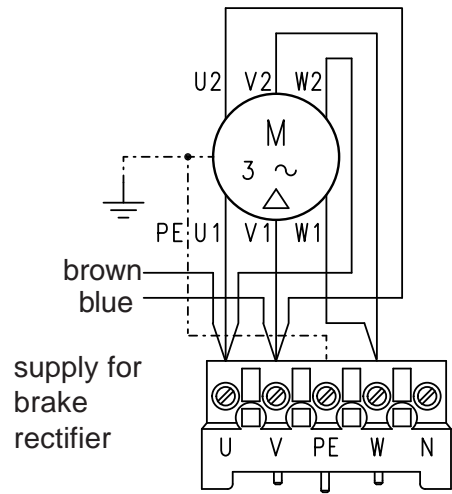
400V – mains supply = 1.5 / 1.6
230V – mains supply = 1.6 / 1.7

MOTOR CONNECTION (internal wiring)

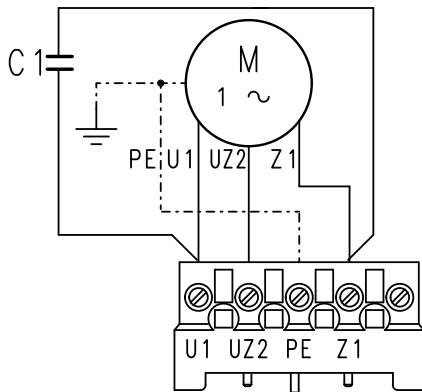
Three-phase 3 x400 V AC, N, PE
Star connection



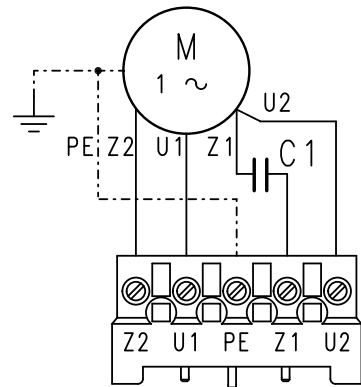
Three-phase 3 x230 V AC, PE
Delta connection



Single-phase 1x230 V AC, N, PE
symmetrical winding



Single-phase 1x230 V AC, N, PE
asymmetrical winding



On several ELEKTROMATEN® the connection U1 und V1 on the motor-plug are interchanged.

PHASE ROTATION



Important Notice!

After the Mains supply has been connected by inserting the CEE plug in the appropriate socket or turning on the main switch, confirm that the phase rotation is correct by checking that the door opens when the OPEN push button is operated.

If the door closes when operating the OPEN push button reverse two phases at the terminal X1.



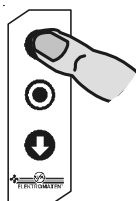
DANGER! To the life and health through electric shock.

Before changing phase rotation the mains supply must be switched OFF.

LIMIT SWITCH - ADJUSTMENT

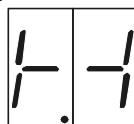
After checking the phase rotation, the limit switches must be adjusted in the following steps. When open and close position limits have been set the safety limits are automatically pre-adjusted. Eventually fine adjustment could be required. Please see Mechanical Operating Instruction.

1. Move the door to final open position

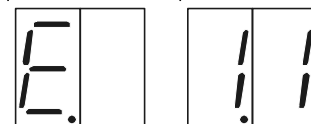


Door open

press button to reach upper limit



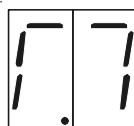
Display shown - door between final limit positions



Display flashing during the door upwards movement

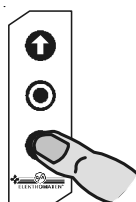
2. Adjustment final open limit

After reaching the final open position the limit S3 must be switched with green limit cam S3 and panel display changes to „Door final open position“



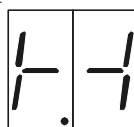
Display shown - door open

3. Move the door to final close position

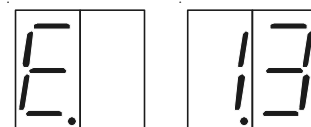


Door close

press button to reach lower limit



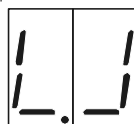
Display shown - door between final limit positions



Display flashing during door downwards movement

4. Adjustment final close position

After reaching the final close position the limit S4 must be switched with green limit cam S4 panel display changes to „Door final close position“

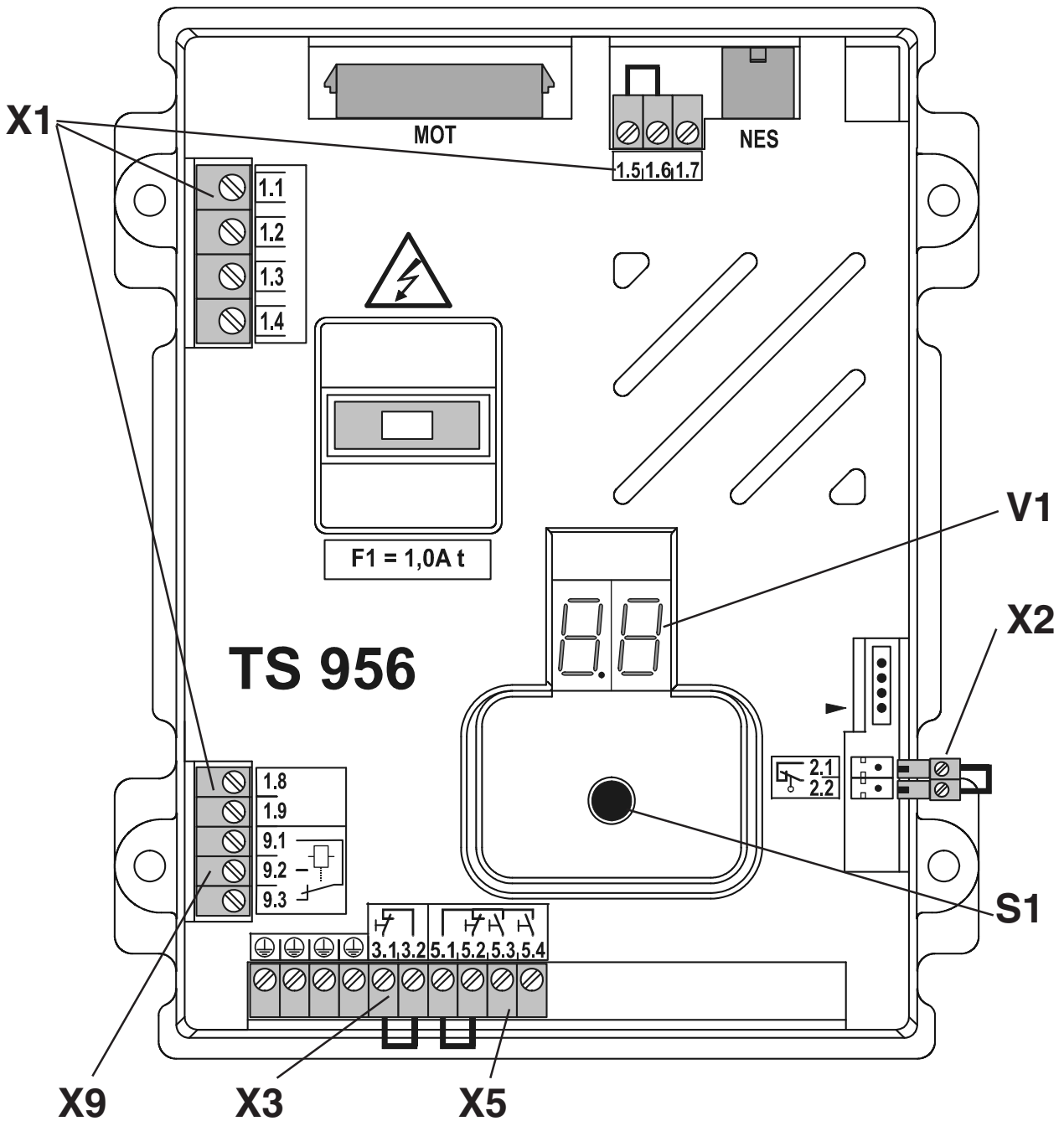


Display shown - door closed

Working limit adjustment is complete

**The door could be moved in DEADMAN mode UP/DOWN
Further adjustments see programming mode (Page 16)**

HARDWARE OVERVIEW



Description Print:

X1 Mains supply
external supply 230V
1.9 = L1 fused with **F1** = 1A
1.8 = N
(only with 3 x 400V, N, PE und 1 x 230V, N, PE)

X2 Pass-door plug

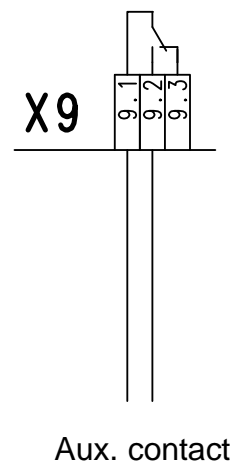
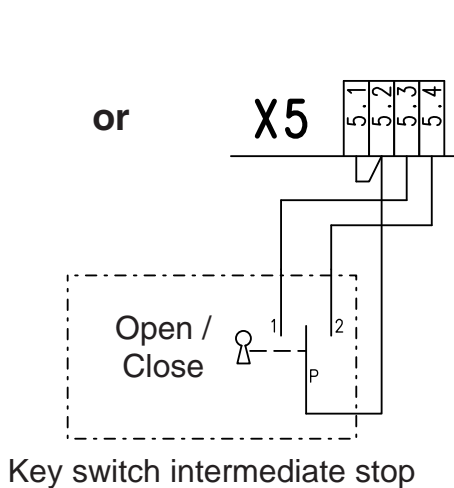
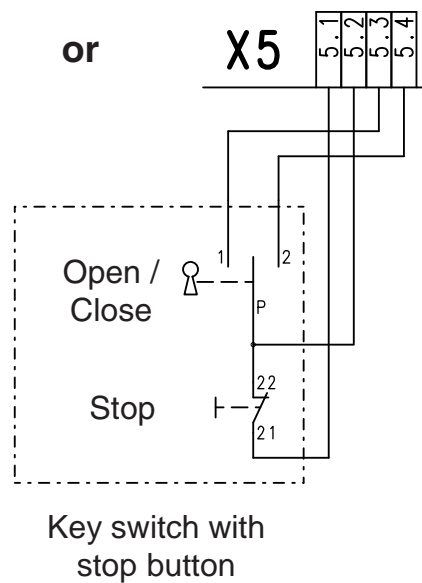
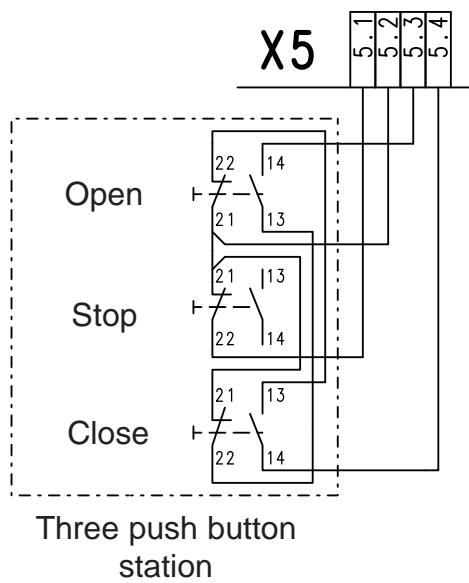
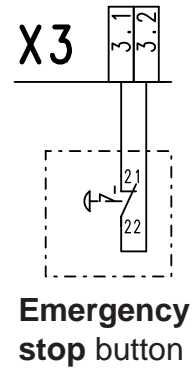
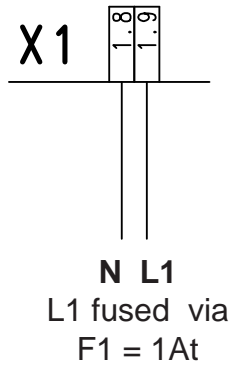
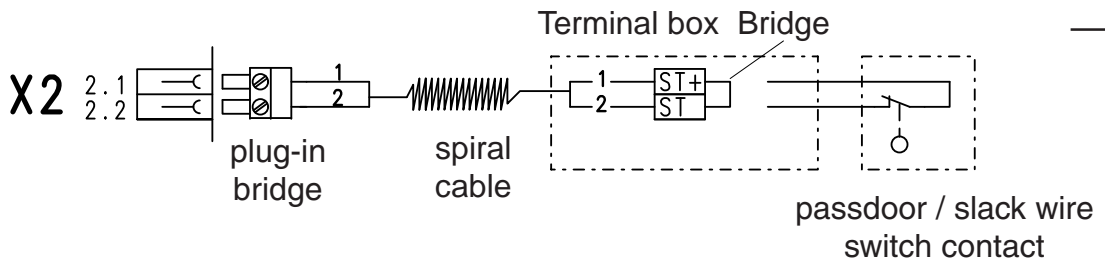
X3 Emergency push button

X5 Three push button / key switch

X9 Potential free relay contact

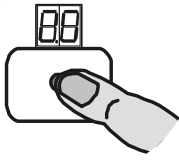
S1 Selector switch
V1 7-segment display
MOT Motor connection
NES Mechanical limit connection
▶ Internal push button

WIRING DIAGRAM



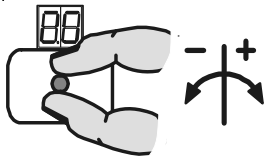
CONTROL PROGRAMMING

1. Enter programming Mode



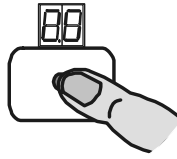
Press selector switch for 3 sec. until **display = 00**

2. Chose program and confirm

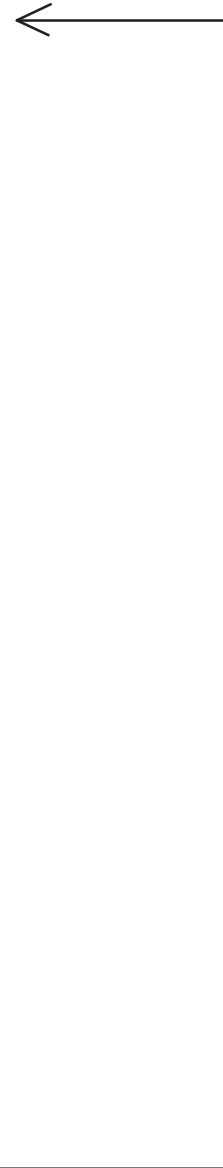


Turn selector

and

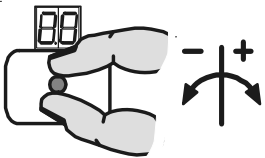


press selector



3. Adjustment

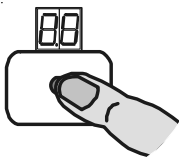
Functionen



Turn selector

4. Memorise

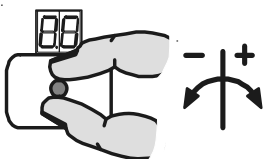
Functionen



Press selector

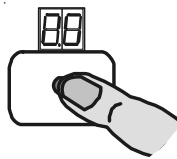
further adjustments

5. Exit programming



Turn selector until display = 00

and



Press selector

CONTROL PROGRAMMING

2. Choose program and confirm		3. Adjustment		4. Memorise	
Operating mode					
Door function		Dead man OPEN Dead man CLOSE	Self-hold OPEN Dead man CLOSE	fully closed control	<input type="radio"/> Press selector
Functions					
Relay function		OFF	Switch contact impulse signal	Switch contact continuous	<input type="radio"/> Press selector
Maintenance cycle counter					
Counter adjustment		01-99 correspond from 1.000 up to 99.000 Count down cycles	<input type="radio"/> Press selector		
Reaction when reaching 0		Display appears „CS“ and adjusted number of cycles	<input type="radio"/> Press selector		
		Changing to Hold-to-run mode in upwards direction, if adjusted Menu 0.1 door function			

MEMORY CHECK

2. Chose program and confirm		Displayed	
Info Cycle counter 7- digit	<input type="radio"/> Press selector		<p>The cycles would be displayed as follow.</p> <p>M = 1.000.000 H = 100 HT = 100.000 Z = 10 ZT = 10.000 E = 1 T = 1.000</p>
Info Program version	<input type="radio"/> Press selector	Program version will be displayed	

SAFETY DEVICES

Mounting the spiral cable

A bush is provided on both sides of the control box for mounting the spiral cable. Push the plugs through, into the enclosure until there is sufficient cable to allow the plug to be connected to the board.

If passdoor / slack wire switch contact exists, remove bridge at terminal ST and ST+ in the terminal box. The plug at terminal X2 must be removed.

Emergency stop X3

These terminals are to connect an emergency stop button according to EN 418. Alternatively the terminals can be used to connect a safety device against entrapment (e.g. self-testing light barrier).

FUNCTION DESCRIPTION

Internal push button / Three push button / Key switch X5

Internal and external push button

Internal and external push button working separately from each other. Pushing at the same time, the internal push button has priority.



Important note!

In Dead man mode the user shall be in full view of the door throughout its travel.

Fully closed control

At this function the self-hold should be activate. The pushbutton must be pressed until the shutter reaches the final limit. Otherwise the door opens in self-hold automatically.

To activate this function, set **Menu 0.1 Adjustment 0.5** - and set pre limit S5 before the final limit close.



Important note!

If pre limit S5 is not adjusted, shutter closing is not possible.

FUNCTION DESCRIPTION

Potential free changeover contact **X9**

In **menu 2.5** this contact is able to work for several functions.



Important note!

It is only possible to work with one adjusted function.

For functioning as a switching contact, impulse or continuous, the switching position must be adjusted by limit switch S6.

Impulse signal On reaching the limit switch the relay contact is made for 1 second.

Continuous signal Relay contact is activated as long the limit switch is made.

Maintenance cycle counter

Free adjustable maintenance cycle counter **Menu 8.5** makes it possible to pre-adjust a max. No of cycles until a maintenance is agreed.

The no of cycles can be adjusted from 1.000 up to 99.000; the adjustment is possible in steps of 1.000 cycles.

Different reactions can be chosen if the point of pre- adjusted maintenance cycles has been reached, see **Menu 8.6**

Whenever the final open limit has been contacted the pre-adjusted number will be reduced with 1 until 0 is reached.

When maintenance was done the cycle counter could be re-adjusted to a new maintenance period and count down starts again.

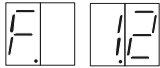





Short circuit / overload monitor




The control TS 956 provides 230V AC for external devices.

230V AC; max. 1A

OPERATING STATUS DISPLAY

The control TS956 can display up to three different status conditions one after another. Each status is displayed with a letter and a number. The letter and the number are flashing alternately, thereby the control differentiates between a FAULT = **F** and a command = **E**.

Report	Description	Measure to solve the problem
	Pass door contact open	Check the proper operation of pass door contact, or whether the supply cable is broken
	Emergency stop activated	Check the emergency stop is activated, or whether the supply cable is broken
	Failure pass door contact X 2.1- X 2.2	Check pass door circuit's transition resistance and whether pass door switch works
	Failure input pass door X 2.1- X 2.2	For reset switch control panel OFF-ON
	Safety open or close limit operated	Turn mains supply OFF and move the shutter downwards - with the manual operator- until the safety limit is free or the open limit should be re-adjusted.
	Emergency operator or motor-winding thermal protection operated	Check emergency operator or whether the drive unit is overloaded.
	Phase rotation failure	Check main supply phase rotation turns right

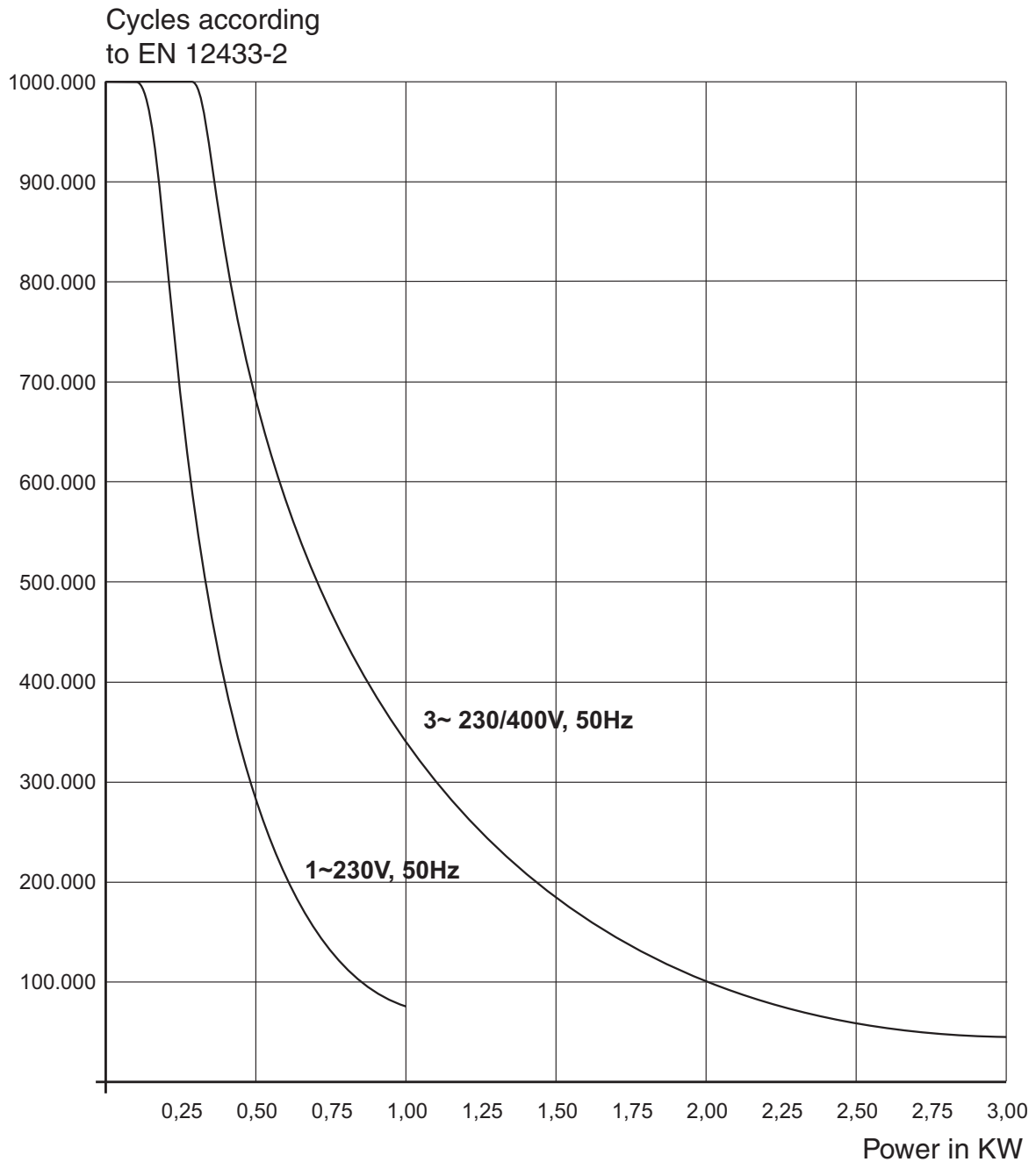
Report	Command description
	open command being given
	stop command being given
	close command being given

	adjusted cycles for maintenance reached
---	---

	Display off = short circuit or overload at the 24V DC supply
---	--

LIFETIME / DOORCYKLES

The GfA control panels working with electro mechanical contactor boards. Contactor boards having generally a limited life time; this depends on the switched power of ELEKTROMATEN® in use and the amount of switching cycles. Therefore we recommend a replacement for control boards in use after doors having reached their confirmed lifetime cycles. Coherence between power and amount of cycles for ELEKTROMATEN® describes diagram bellow.



TECHNICAL DATA

Housing Dimensions	190mm x 300mm x 115mm (B x H x T)
Mounting	vertical
ELEKTROMATEN® Supply	Three-phase 3 x 230 / 400V AC ± 5%, 50...60Hz Single-phase 1 x 230V ± 5%, 50...60Hz Power max. at 3 x 400V AC, max. 3kW
Control supply via L1,L2	400V AC or 230V AC + - 10%, 50-...60Hz, voltage changing with bridge to 3- pol terminal, safety fuse F1 (1A t)
External supply fuse	10A delayed
Permitted Load	ca. 15 VA (without motor and ext. 230V)
External supply 1	230V via L1 and N, safety fuse F1 (1A t)
Inputs	24V DC / typ. 10mA signal length must be more than 100ms
Relay output	If inductive loads are to be switched (e.g. other relays) those have to be protected with free-wheeling Diodes contact load at 230V max. 1A
Temperature	Working: -5.... +40°C Storage: +0....+50°C
Humidity:	To 93% not condensing
Vibration:	Vibration free mounting, e.g. on flat built wall
Protection class	CEE Plug IP54, IP65 deliverable

DECLARATION OF INCORPORATION

in the terms of Machinery Directive 2006/42/EC
for partly completed machinery, Appendix II Part B



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Telefon: +49 (0) 211-500 90 0
Telefax: +49 (0) 211-500 90 90
www.gfa-elektromaten.de

Declaration of conformance

in terms of EMC Directive 2004/108/EC

We, the
GfA - Gesellschaft für Antriebstechnik
hereby declare that the following products are conform with the
above EC Guidelines and are only intended for installation in door equipment.

Door control panel TS 956

Standards applied

- DIN EN 12453** Doors - safety in use of power operated doors
- DIN EN 60335-1** Safety of household and similar electrical appliances
Purposes - Part 1 : General requirements
- DIN EN 61000-6-2** Electromagnetic compatibility (EMC) Part 6-2
Generic standard – Emission standard for industrial environments
- DIN EN 61000-6-3** Electromagnetic compatibility (EMC) Part 6-3
Generic standard – Emission standard for residential,
commercial and light-industrial environments

We undertake to transmit in response to a reasoned request by the appropriate regulatory
authorities the special documents
on the partly completed machinery.

Authorised representative for the compilation of the relevant technical documents

(internal EU address)

Dipl. Ing. Bernd Synowsky
Documentation representative

Incomplete machines within the meaning of the EC Directive 2006/42/EC shall only be intended
to be integrated into other machines (or into other incomplete machines/systems) or to be
assembled with them to form a complete machine within the sense of the Directive. Therefore,
this product cannot be commissioned before it is determined that the entire machine/system to
which it was integrated shall comply with the provisions of the Machinery Directive indicated
above.

Düsseldorf, 01. 01. 2010

Stephan Kleine
CEO


Signature

FUNCTION OVERVIEW

- **Control panel for ELEKTROMATEN®** up to. 3 kW at 400V / 3~ phase with mechanical limits
- **7- Segment led display showing**
 - Programming the control panel
 - Displays Command - / Info- / Fault
- **Mains supply**
 - 400V / 3~ with and without Neutral
 - 230V / 3~
 - 230V / 1~ (for single-phase motors)
- **Door operating modes**
 - Dead-man open- and close
 - Self-hold open- and dead-man mode close
 - Fully closed control
- **Supply for external devices**
 - 230V (at 400V / 3~ with N), up to 1A load
- **Plug connection for the motor (5 - pole) and limit switches (6- pole)**
- **Plug for spiral cable (safety edge and pass-door contact)**
- **Internal pushbutton OPEN / STOP / CLOSE**
- **Additional terminals for different control equipment**
 - Emergency stop (LATCHING)
 - Additional safety stops
 - External three push button OPEN / STOP / CLOSE
 - 1x potential free relay output (NC / NO), output signal from aux. limit