



Electrical operating instructions

Door control panel TS 958

Software 1.2 - (Design and functions subject to change)



OPERATING INSTRUCTIONS

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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 TS 958 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 TS 958 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 Control Panel, 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 normative

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

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:
Prescriptions générales
- 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 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

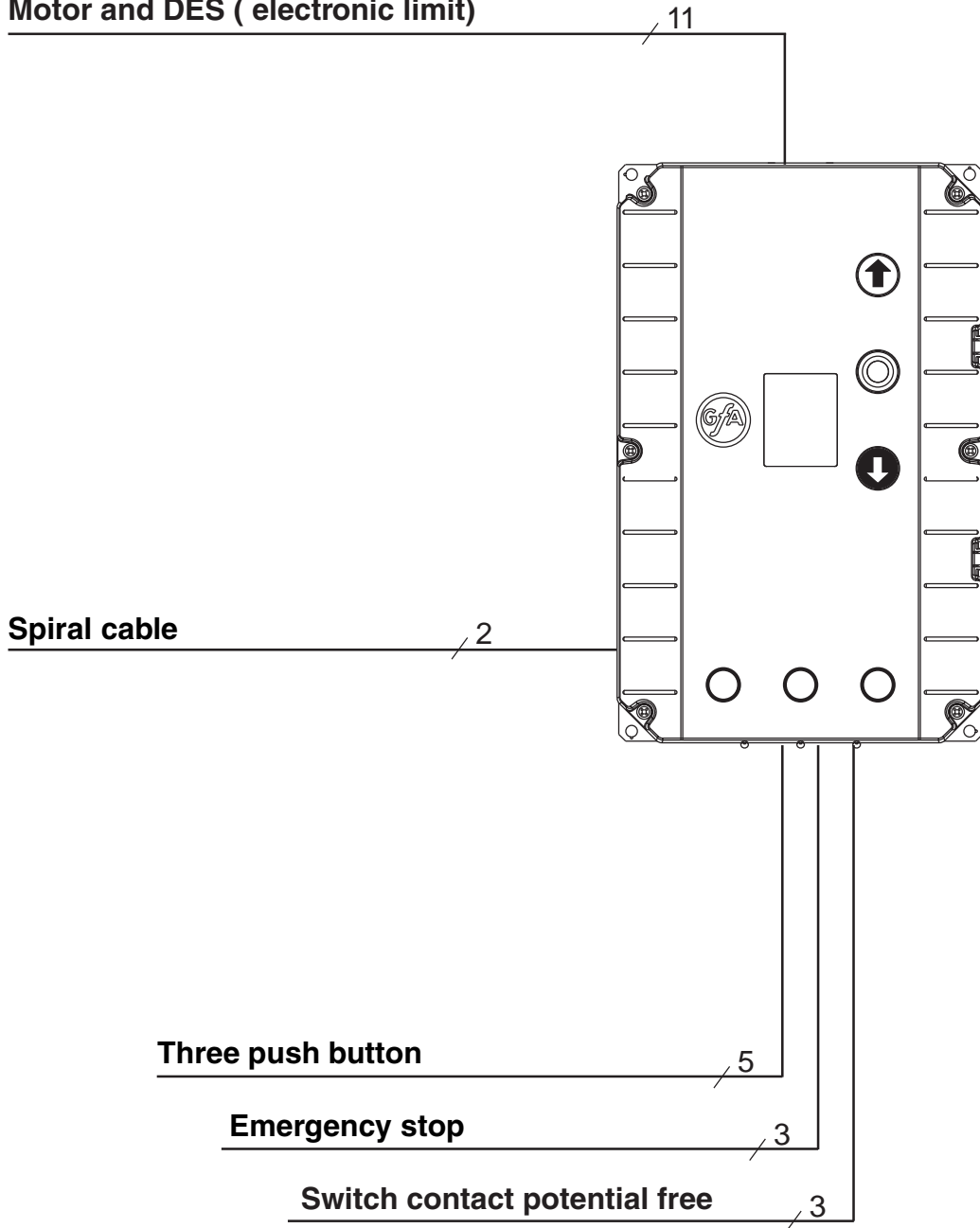
INSTALLATION OVERVIEW



Important!

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

**Connection cable ELEKTROMAT® for
Motor and DES (electronic limit)**



 () 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®

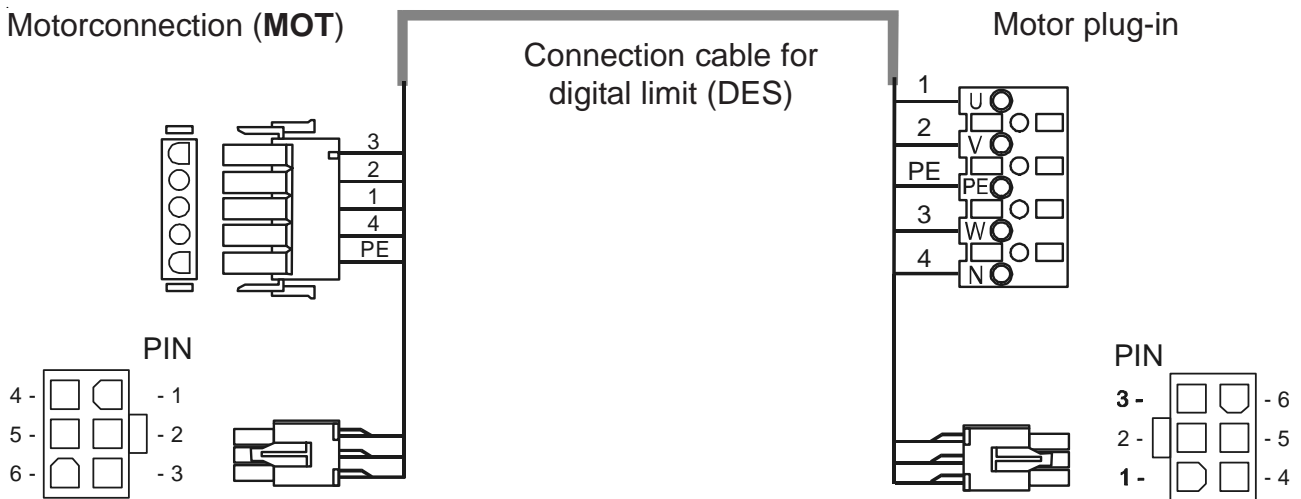
After the drive and control are fitted they can be connected with a plug-in cable. The cable has plugs on each end and for easy fitting. The plugs for motor and control panel are different and cannot be interchanged.

Control panel TS 958

ELEKTROMAT®

Motorconnection (MOT)

Motor plug-in



Cable identification

Motor plug to control unit

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

Limit plug-in to control panel TS 958 (DES)

| PIN | - Wire-No. | Excution: |
|-----|------------|---------------------|
| 1 | - 5 | Safety chain 24V DC |
| 2 | - 6 | RS485 B |
| 3 | - 7 | GND |
| 4 | - 8 | RS485 A |
| 5 | - 9 | Safety chain |
| 6 | - 10 | 8V DC |

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 958 has a universal electric supply and works with the following supplies. (See diagram Fig.1-5)

Mains supply terminal

Fig.: 1

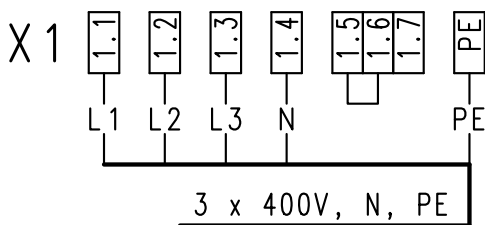


Fig.: 4

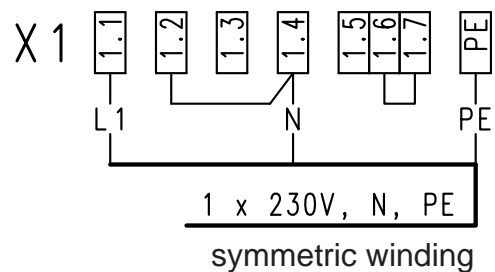


Fig.: 2

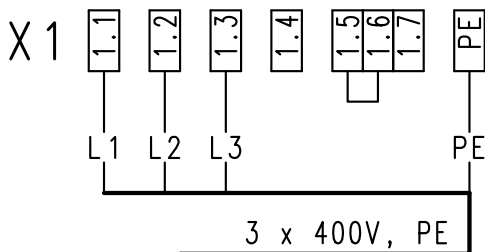


Fig.: 5

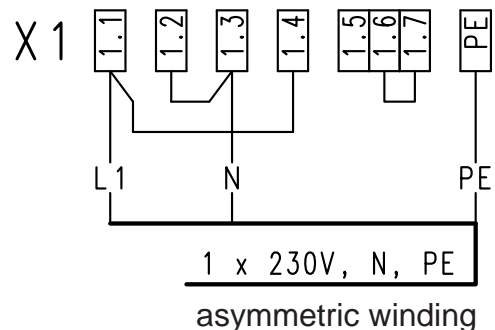
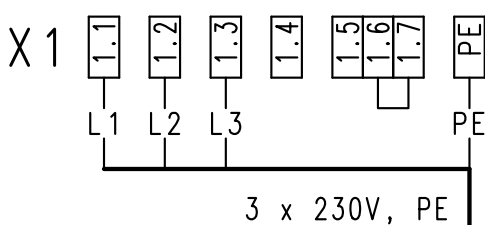


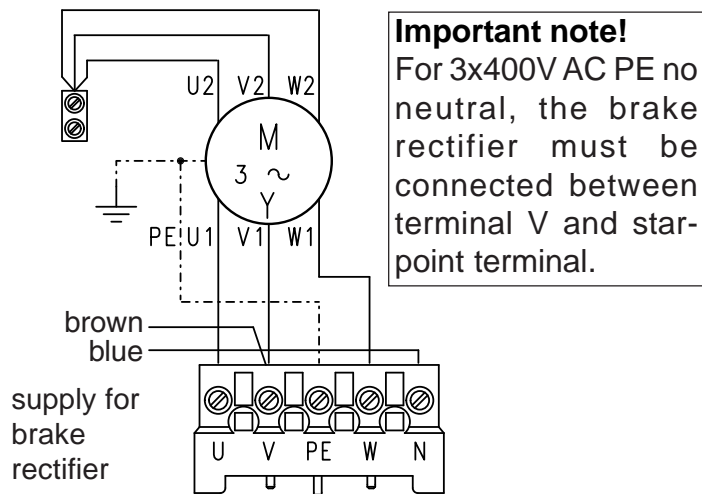
Fig.: 3



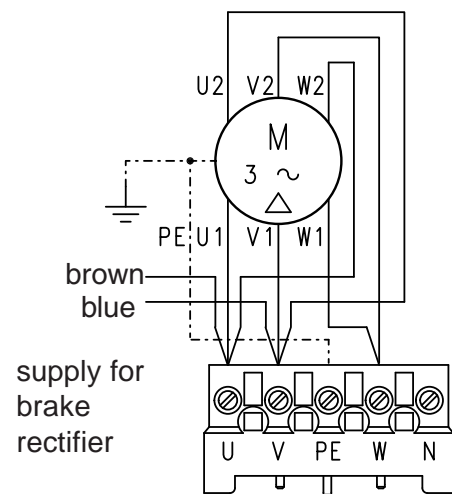
400V – mains supply = 1.5 / 1.6
230V – mains supply = 1.6 / 1.7

MOTOR CONNECTION (internal wiring)

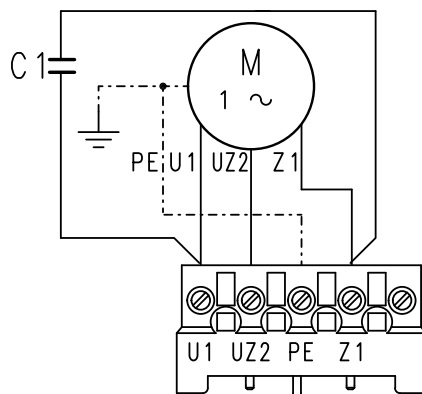
Three-phase 3 x 400 V AC, N, PE
Star connection



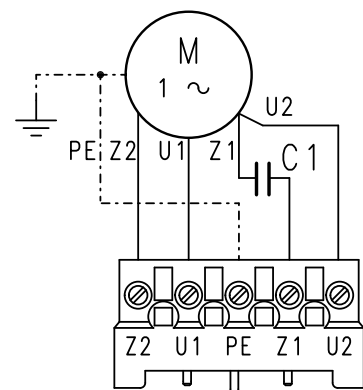
Three-phase 3 x 230 V AC, PE
Delta connection



Single-phase 1 x 230 V AC, N, PE
symmetrical winding



Single-phase 1 x 230 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.



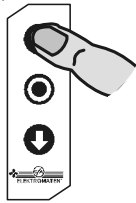
DANGER! To the life and health through electric shock.

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



RAPID ADJUSTMENT OF THE LIMITS

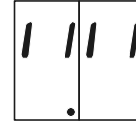
When the phase rotation has been checked the Rapid limit adjustment can be made. The final setting can be made with the fine adjustment (Control Programming page 15). Safety limits and pre-limits are automatically adjusted.

1. Setting final limit open



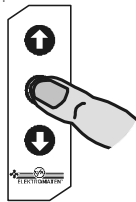
Door open

press button to reach upper limit 


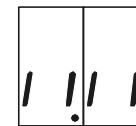


Display
blinking

2. Memorise the final limit open



Press stop-button for 3 sec. until
the display changes

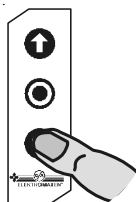


Display
changes





The final limit OPEN is memorised when the door moves for at least one second from close into the upper limit position.

3. Setting the final limit close



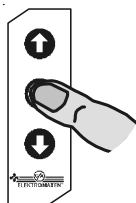
Door close

press button to reach lower limit 


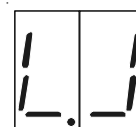


Display
blinking

4. Memorise the final limit close



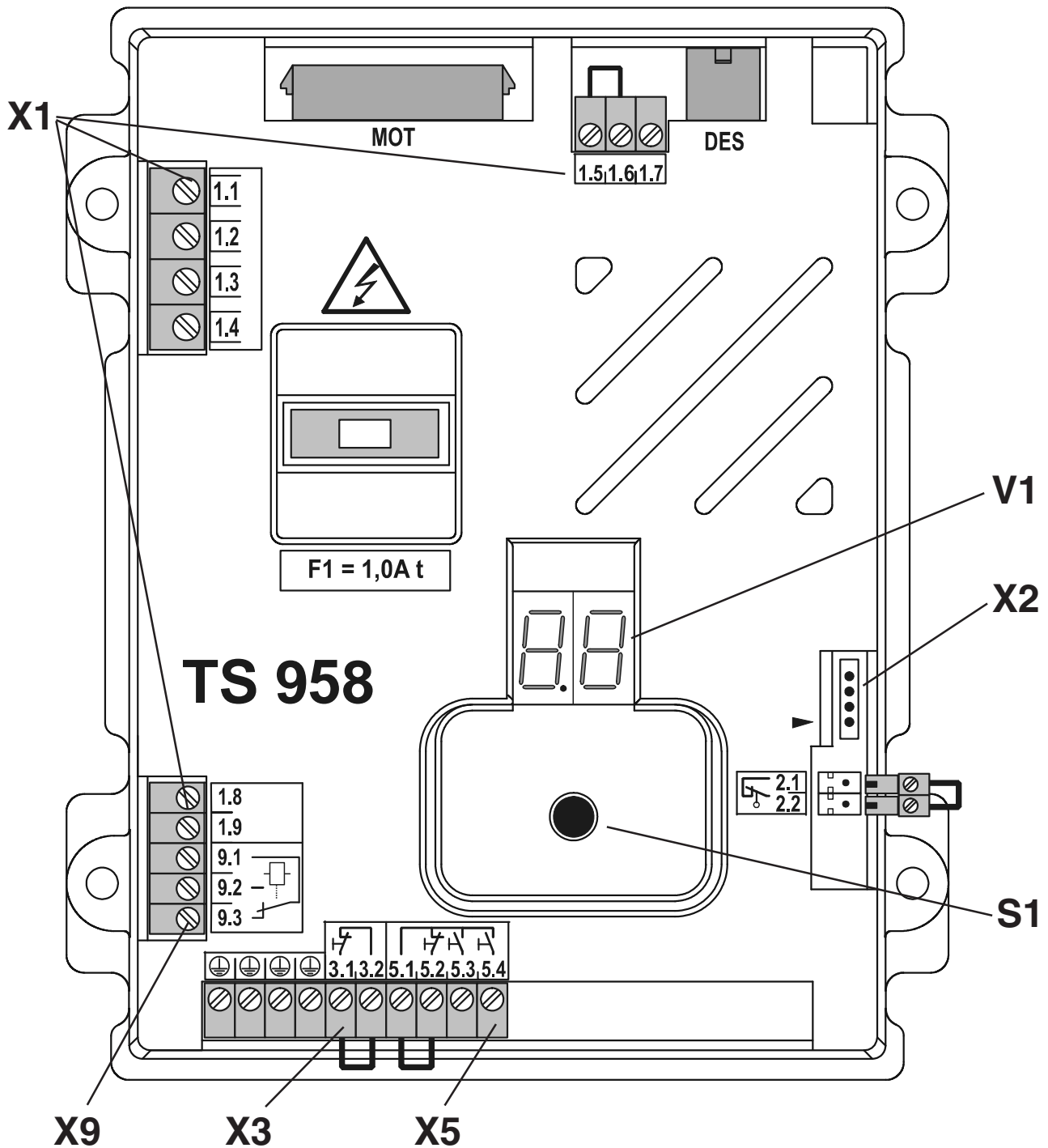
Press stop-button for 3 sec. until
the display changes



Display
changes

The Rapid adjustment is finished
The door could be moved in DEADMAN mode UP/DOWN
Further adjustments see programming mode

HARDWARE OVERVIEW

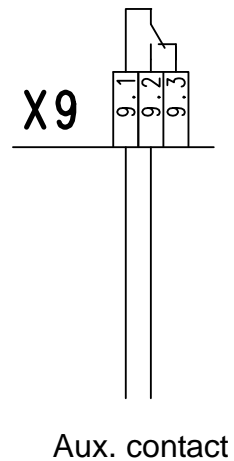
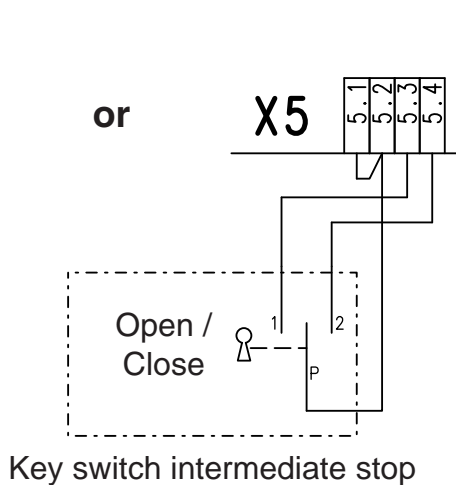
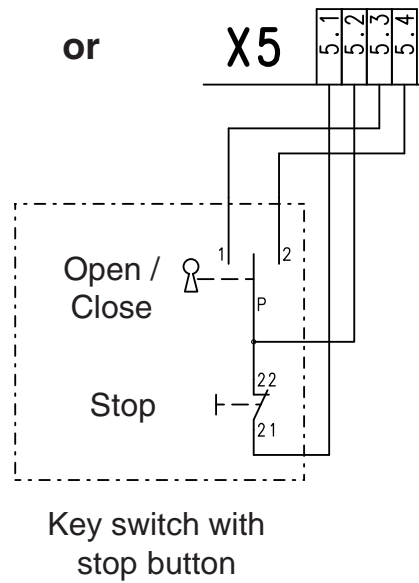
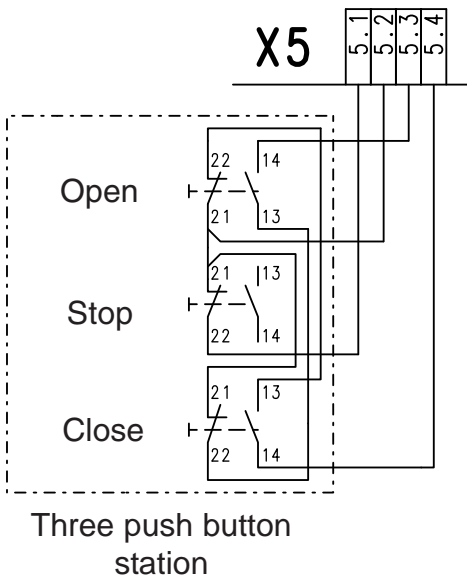
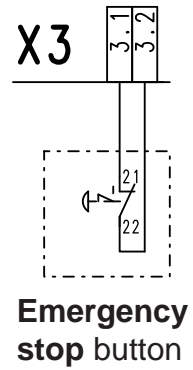
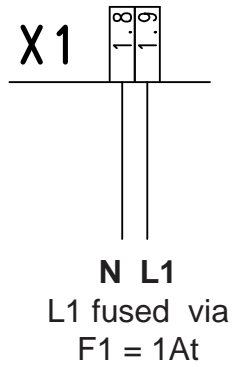
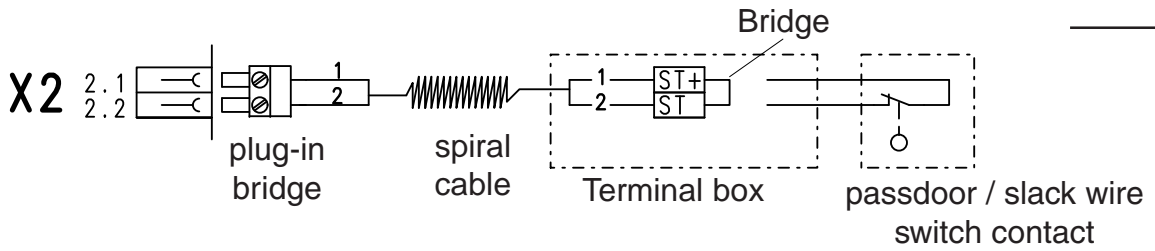


Description Print:

- 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** Safety edge system and pass-door plug
- X3** Emergency push button
- X5** Three push button / key switch
- X9** Potential free relay contact

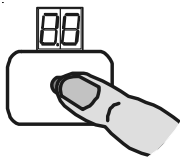
- S1** Selector switch
- V1** 7-segment display
- MOT** Motor connection
- DES** Limit connection
- ▶ Internal push button

WIRING DIAGRAM



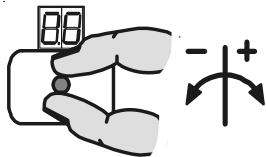
CONTROL PROGRAMMING

1. Enter programming Mode



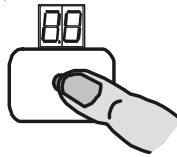
Press selector switch for 3 sec. until **display = 00**

2. Chose program and confirm



Turn selector

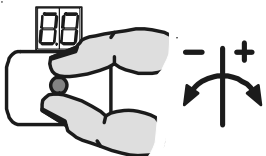
and



Press selector

3. Adjustment

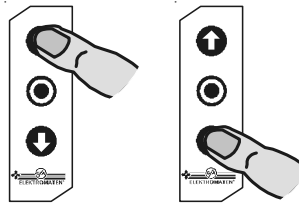
Functionen



Turn selector

or

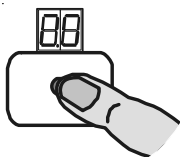
Door position



Press foil buttons

4. Memorise

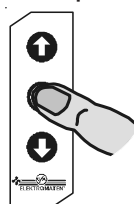
Functionen



Press selector

or

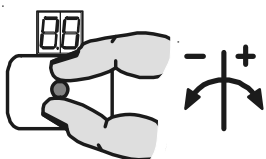
Door position



Press stop-button

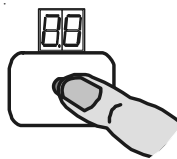
further adjustments

5. Exit programming

































Turn selector until display = 00

and












Press selector

CONTROL PROGRAMMING





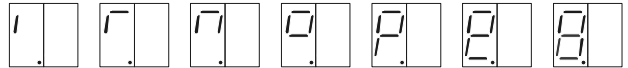

| 2. Choose program and confirm | 3. Adjustment | 4. Memorise |
|---|---|---|
| Operating mode | | |
|  Door function |  Dead man OPEN Dead man CLOSE  Self-hold OPEN Dead man CLOSE  fully closed control |  Press selector |
| Door position | | |
|  Final limit open coarse adjustment |  Move door upwards or downwards |  Press stop Button |
|  Final limit close coarse adjustment |  Move door upwards or downwards |  Press stop Button |
|  Final limit open fine adjustment |  Final limit open can change without door movement using +/- |  Press selector |
|  Final limit close fine adjustment |  Final limit close can change without door movement using +/- |  Press selector |
|  Relay switch position |  Move to relay switch position |  Press stop Button |
| Functions | | |
|  Relay function |  OFF  Switch contact impulse signal  Switch contact continuous |  Press selector |
| Safety functions | | |
|  Door overload monitor |  OFF  sensitive  insensitive |  Press selector |

See page 11: [Limit switch rapid - Adjustment](#)




CONTROL PROGRAMMING

| 2. Chose program and confirm | 3. Adjustment | 4. Set |
|--|---|--|
| Maintenance cycle counter | | |
|  Counter adjustment |   01-99 correspond from 1.000 up to 99.000 count down cycles |  Press selector |
|  Reaction when reaching 0 |   Display appears „CS“ and adjusted number of cycles  Changing to Hold-to-run mode in upwards direction, if adjusted Menu 0.1 door function |  Press selector |

MEMORY CHECK

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

RESET

| 2. Chose program and confirm | 3. Adjustment | 4. Set |
|---|--|--|
|  RESET except cycle- and Program change counter |   Reset | <input checked="" type="radio"/> Press stop button 3 sec. |

SAFETY DEVICES

Pass door / slack rope switch input X2

The pass door switch Entrysense features a protective function complying with safety category 2 under EN 954-1. The electrical contact is monitored by the control panel that outputs **fault F1.7** when it malfunctions.

The electronic pass door switch Entrysense: function and test

The pass door switch Entrysense is fitted with two reed contacts that are switched by a permanent magnet. The control panel evaluates the switching states and the contact resistance independently of each other.

At the lower limit position **F1.2** is displayed when an OPEN command is given and at the same time the pass door / slack rope switch circuit is open. The door can be moved only after the pass door has closed or when the pass door / slack rope switch circuit signals OK. If the circuit will be opened when the door is moving the door is stopped immediately.

F1.7 is displayed when an OPEN command is given after the door controller has detected beforehand asymmetrical pass door switch positions (see below for reasons). This fault can be reset when the door is reopened. This ensures that contact misalignments caused by vibrations from the moving door do not trigger door shutdown.

Possible reasons for fault F1 .7

| Decription | Measures to solve the problem |
|---|--|
| Door was not fully closed for longer than 2 s so that only one reed contact was switched during this time. | Reopen and close the door. |
| The control voltage was less than 21,6V for longer than 2 s (by 10%). | After troubleshooting reopen and close the door. |
| Contact resistances too high in the pass door / slack rope switch circuit | With the pass door closed: Measure resistance and if necessary replace the contact resistances in the pass door / slack rope switch circuit. |
| Electronic pass door switch is not installed correctly: <ul style="list-style-type: none">• distance between switch and magnet too large• switch and magnet not attached at the same height• switch installed at wrong position | Check that the shutter pass door switch is installed correctly. After troubleshooting reopen and close the door. |

SAFETY DEVICES

Mounting the spiral cable **X2**

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 DIN 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**.

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.

When activating the switching point the shutter must be moved to the point. **Menu 1.7** must be activated.

FUNCTION DESCRIPTION

Door overload monitor

The door overload monitor recognises that a person is being lifted by the door (hanging on a handle, etc.) and could be adjusted within **Menu 3.1** with a possibility of two steps of sensitivity. Adjustment 0.1 sensitive reaction and adjustment 0.2 insensitive reaction



Important!

After programming the force monitoring the door must perform a complete opening and closing cycle without an interruption. Durich which the system reads the increments to calculate the way.



Important Note!

To have a trouble-free service the following points must be checked:

- The door must be correctly balanced
- The cable drum diameter should not be less then 160mm

Environmental influences e.g. temperature or wind load can cause the overload monitor to be activated.

The overload monitor is a self-learning system, and checks the system from 5 cm up to ca. 2,0 m, slow-occurring changes e.g. spring tension will be automatically recognised and equalized.



Important Note!

The overload monitor does not take place against other safety devices e.g. (safety against entrapment)

When an overload is detected the door works only Dead man Mode in the UP and DOWN direction.

The control unit automatically resets to impulse control when a final limit position has been reached.

FUNCTION DESCRIPTION

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.

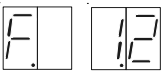




Short circuit / overload monitor

The control TS 958 provides 230V AC for external devices.

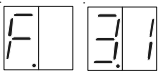









230VAC;max. 1A

OPERATING STATUS DISPLAY




The control TS 958 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 X 2.1- X 2.2 | Check the proper operation of pass door contact, or whether the supply cable is broken |
|  | Emergency operator or motor-winding thermal protection operated | Check emergency operator or whether the drive unit is overloaded. |
|  | 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 or control voltage circuit less than 24V | Check pass door circuit's transition resistance and whether pass door switch works. To acknowledge the fault open and close the pass door switch, off and on the main switch, or disconnect and reconnect the mains plug. |
|  | Failure input pass door X 2.1- X 2.2 | To acknowledge the fault switch off and on the main switch or disconnect and reconnect the mains plug. If necessary replace the control panel. |

OPERATING STATUS DISPLAY






| Report | Description | Measure to solve the problem |
|---|---------------------------------|---|
|  | Safety open 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. |
|  | Safety close limit operated | Turn mains supply OFF and move the shutter upwards - with the manual operator- until the safety limit is free or the close limit should be re-adjusted. |
|  | Door load monitor has activated | Check the door mechanism for tightness |
|  | ROM - Fault | To acknowledge the fault; switch OFF/ON on the mains or disconnect and reconnect the mains plug. If necessary replace the control panel. |
|  | Internal fault report | To acknowledge the fault; switch OFF/ON on the mains or disconnect and reconnect the mains plug. If necessary replace the control panel. |
|  | RAM - Fault | To acknowledge the fault; switch OFF/ON on the mains or disconnect and reconnect the mains plug. If necessary replace the control panel. |
|  | Internal control fault | To acknowledge the fault; switch OFF/ON on the mains or disconnect and reconnect the mains plug. If necessary replace the control panel. |
|  | DES – no response | Check electronic limit DES connection. To acknowledge the fault; switch OFF/ON on the mains or disconnect and reconnect the mains plug. If necessary replace the control panel. If necessary replace the control panel or digital limit DES). |
|  | Drive unit does not work | Check the shutter mechanics. Check the limit shaft for function (turning) Check phase rotation. |
|  | Phase rotation failure | Check main supply phase rotation turns right |

OPERATING STATUS DISPLAY

| 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 |
|--|--|

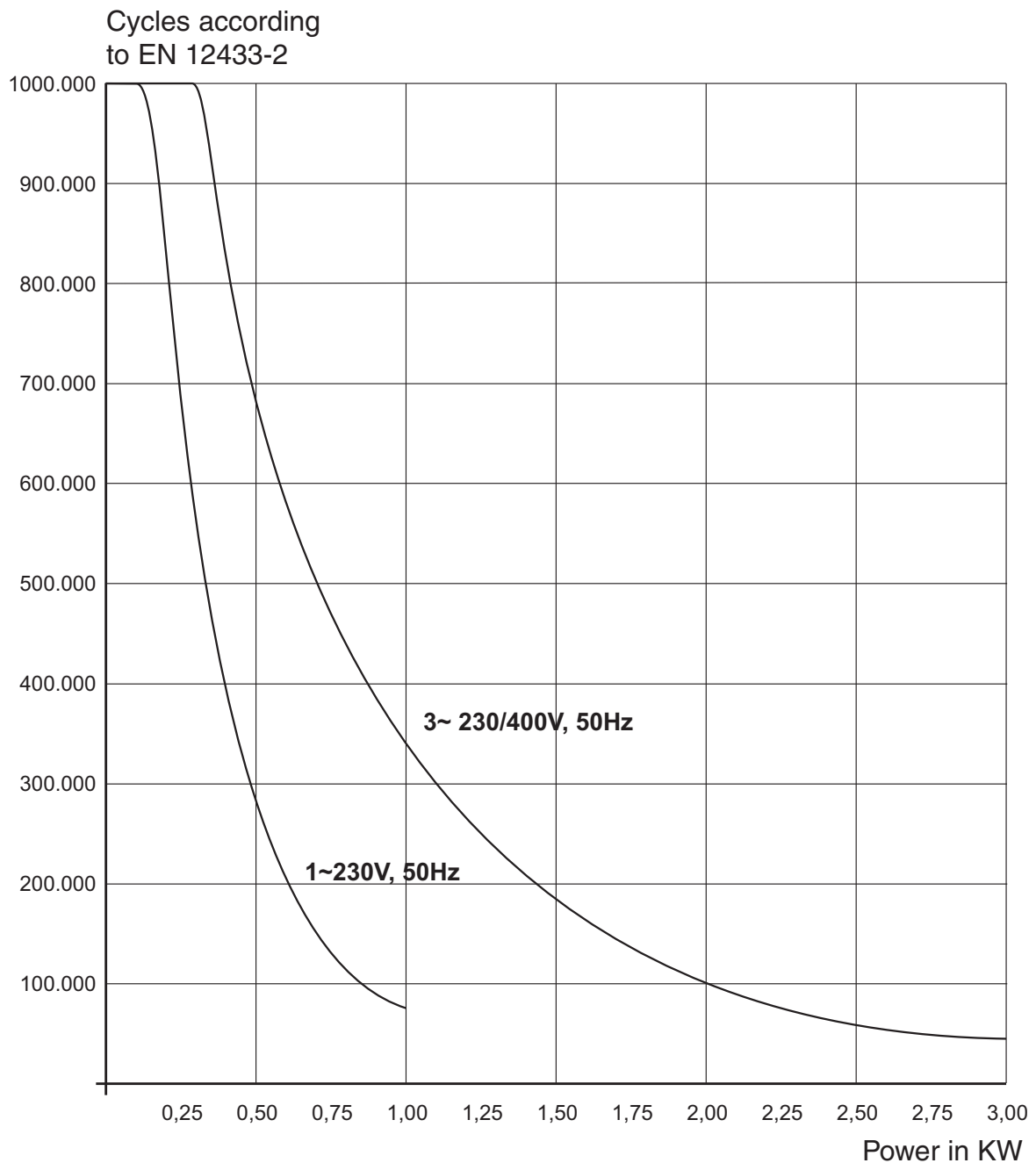
| Report | Status |
|---|---------------------------------|
|  flashing | opening |
|  flashing | closing |
|  | door stopped between set limits |
|  | door stopped at upper limit |
|  | door stopped at lower limit |

TECHNICAL DATA

| | |
|--------------------------|---|
| Housing Dimensions | 190mm x 300mm x 115mm (W x H x D) |
| 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- pole terminal, safety fuse F1 (1A t) |
| External supply fuse | 10A delayed |
| Permitted Load | ca. 15 VA (without motor and ext. 230V) |
| External supply | 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: +0.... +40°C Storage: +0....+50°C |
| Humidity: | To 93% not condensing |
| Vibration: | Vibration free mounting, e.g. on flat built wall |
| Protection class | IP54 (CEE Plug), IP65 available |

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 below.



DECLARATION OF INCORPORATION

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



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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 958

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~ with electronic limit **DES** designed for only low-level adjustment
- **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 for 5 pole motor connector 6 pole for electronic limit DES**
- **Plug for spiral cable pass-door contact**
- **Integrated internal pushbutton OPEN / STOP / CLOSE**
- **Additional terminals for different control equipment**
 - Emergency stop (LATCHING)
 - Additional safety stops
 - External three push button OPEN / STOP / CLOSE
 - Key switch (latching) for intermediate Stop
 - 1x potential free relay output (NC / NO), switching contact continuous or impulse