en

GfA ELEKTROMATEN®

Electrical operating instructions

Reversing contactor universal WS 905, sliding door

integrated limits
with / without magnetic brake / springassisted magnetic brake

TÜV CERT
DIN EN ISO 9001:2000
Zertifikat: 01 100 5118

51171272 - b 07.2008

consisting of:

M : Mechanical Operating Instructions (separately enclosed)

E : Electrical Operating Instructions

List of contens E **Page**

Basic Directions

This control has been built in accordance with **DIN 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 ELEKTROMAT® 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 normative

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

Please check normative bellow.

VDE-regulations

- DIN EN 418
  Safety machinery
  Emergency stop equipment functional aspects
  Principles for design
- DIN EN 60204-1 / VDE 0113-1
  Safety of machinery - Electrical equipment of machines - Part 1:
  General requirements
- DIN 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

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.

- 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.
- Emergency stop devices in accordance with VDE 0113 (EN60204) should remain operational in all operating modes of the control. Releasing the emergency stop device should not cause any uncontrolled or undefined restart.

ELECTRICAL CONNECTION

Warning! Danger to life through electric shock
Before starting assembly, disconnect the cables from the electricity supply and check that they are dead.

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.

The following tools are recommended for the appropriate electrical connection of the ELEKTROMAT®:
- Multimeter (for alternating current up to at least 750 VAC)
- Electrically insulated screw driver
- Cable stripper
- Diagonal cutter
- Piercing tool to open the cable ducts
- Wire end ferrules with associated pinching tongs when using flexible cables

In order to connect the ELEKTROMAT® electrically, the lid of the reversing contactor housing must first be removed. After loosening the two lid screws, the housing lid can be swiveled about 45° (Fig.1) and removed.
The cable ducts in the reversing contactor housing must be opened with a piercing tool. The hole in the cable duct should be smaller than the cable diameter to ensure sealing. When the cable duct is opened with a knife or a screw driver, sealing cannot be guaranteed.
If necessary, the complete reversing contactor housing can be removed, after loosening the two mounting screws, and mounted next to the ELEKTROMAT®.

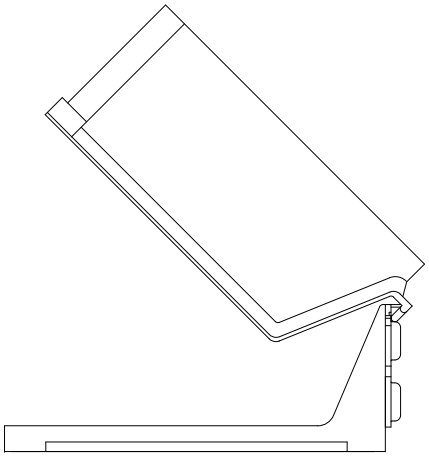

Fig. 1: Reversing contactor housing

The cables should be connected in accordance with the primary electrical circuit diagram.
The **3 phases** of the incoming supply are connected to the contactor K1 with the terminals L1/L2/L3, the neutral conductor is connected to terminal strips designated N.
For **single phase** the incoming supply are connected to the contactor K1, phase L1 and neutral to designated terminal N.
The PE (earth) conductor are connected to the terminal strips designated PE.

Check that all screw connections are secure before operating the control and adjusting the limit switches.
Check incoming supply before connecting the mains supply / in terminals transformer. (X6, wire link G)

ASSEMBLY OF THE REVERSING CONTACTOR BOARD

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The use of non-interchangeable connectors for the limit switch make it easy to assemble and/or change the reversing contactor board.

When doing so, the following steps should be carried out:

Disassembly:

- Remove limit switch cover
- Detach the plug from the limit switch board; after pulling the upper end of the plug, the entire plug can be pulled out easily (**Fig. 2**, whilst doing so, hold the entire limit switch board firmly with the other hand)
- Pull out 5 - pole motor plug and PE **(Fig. 3 / 4 / 5)**
- Pull the connecting cable for the reversing contactor housing, together with the cable duct, out of the gearbox housing
- Remove the reversing contactor housing by loosening the mounting screws

Assembly:

- Mount the reversing contactor housing
- Insert the connecting cable with the cable duct into the gearbox housing
- Plug in 5 - pole motorsocket **(Fig. 3 / 4 / 5)**
- Insert the limit switch plug whilst holding the entire limit switch board firmly with the other hand
- Check limit switch adjustment
- Mount limit switch cover

Fig. 2: Limit switch plug

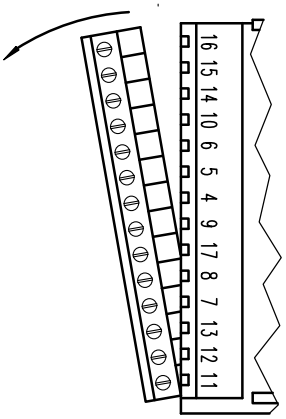


Fig. 3: Motor Terminal Rail for 3x400V/230V

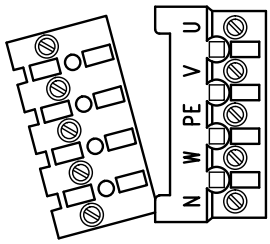


Fig. 4: Motor Terminal Rail for single-phase motor asymmetric winding

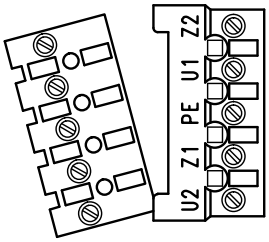
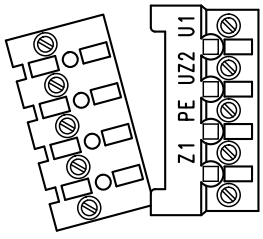


Fig. 5: Motor Terminal Rail for single-phase motor symmetric winding



REVERSING CONTACTOR BOARD

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The control consists of a printed circuit board with a pair of reversing contactors for opening (K1) and closing (K2). Different functions can be achieved by interchanging wire links.

Fif. 6) : Reversing contactor board for: 3 x 400V AC, N, PE or 3 x 400VAC, PE
3 x 230V AC, PE;

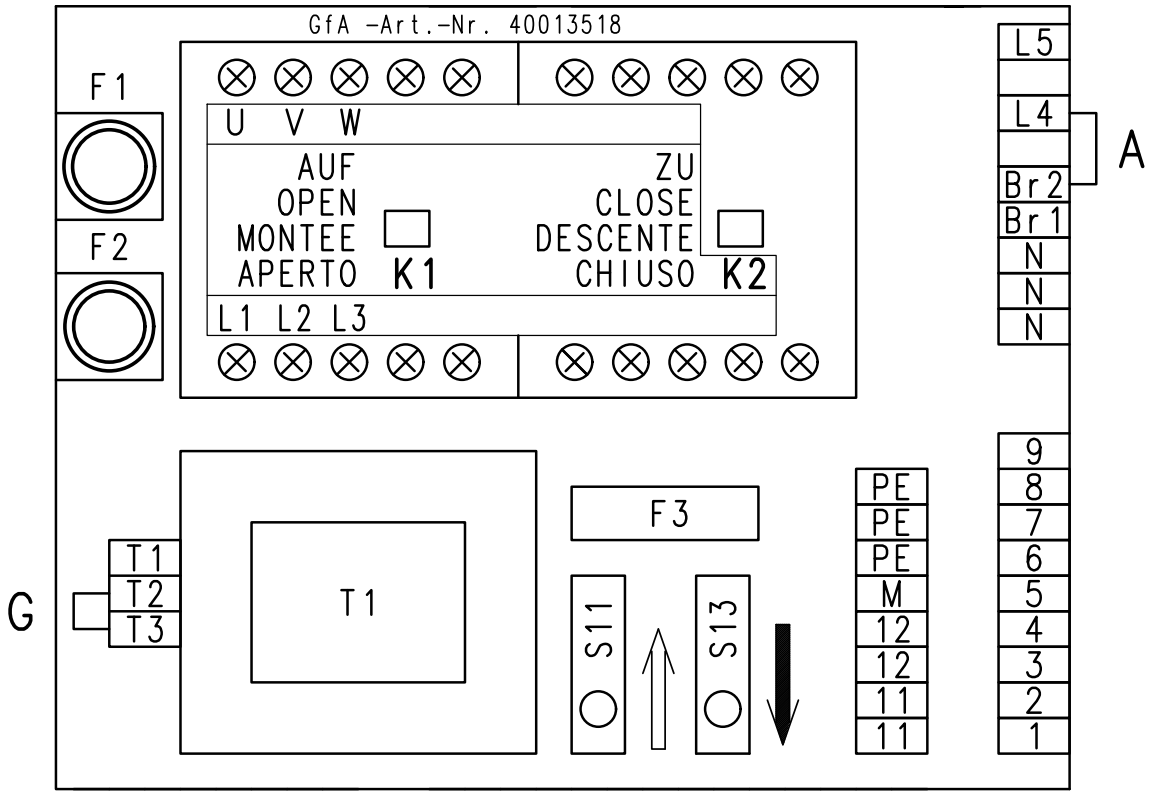


Fig. 7) : circuit board for:
1 x 220/230V with symmetric winding

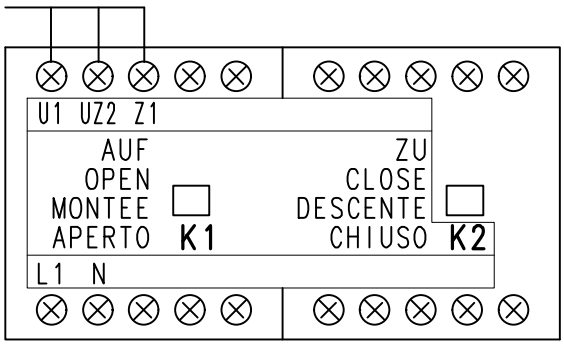
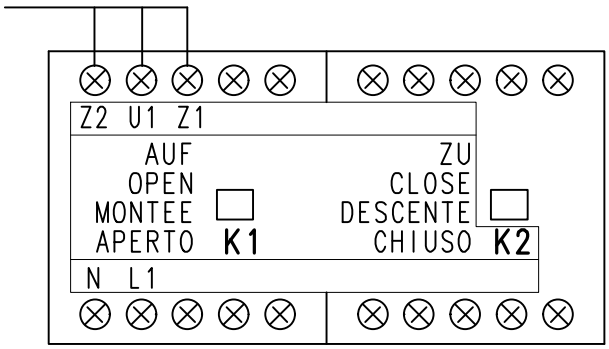


Fig. 8) : circuit board for:
1 x 220/230V with asymmetric winding



WIRE LINKS ON THE REVERSING CONTACTOR BOARD

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Wire link A:
This link shall be used to control the magnetic brake. Depending the main supply link shall be connected, see bellow.

Wire link A	terminal L4 to Br2	=	3x400V, N, PE; 3x400V, PE; 3x230V AC, PE; 1x230V AC (sym)
	L5 to Br2	=	1x230V AC (asym)

Wire link G:
This wire link is requested to choose the incoming mains supply.

Wire link G terminal T1 to T2	=	1 x 230V AC, N, PE 3 x 230V AC, PE
Wire link G terminal T2 to T3	=	3 x 400V AC, N, PE 3 x 400V AC, PE

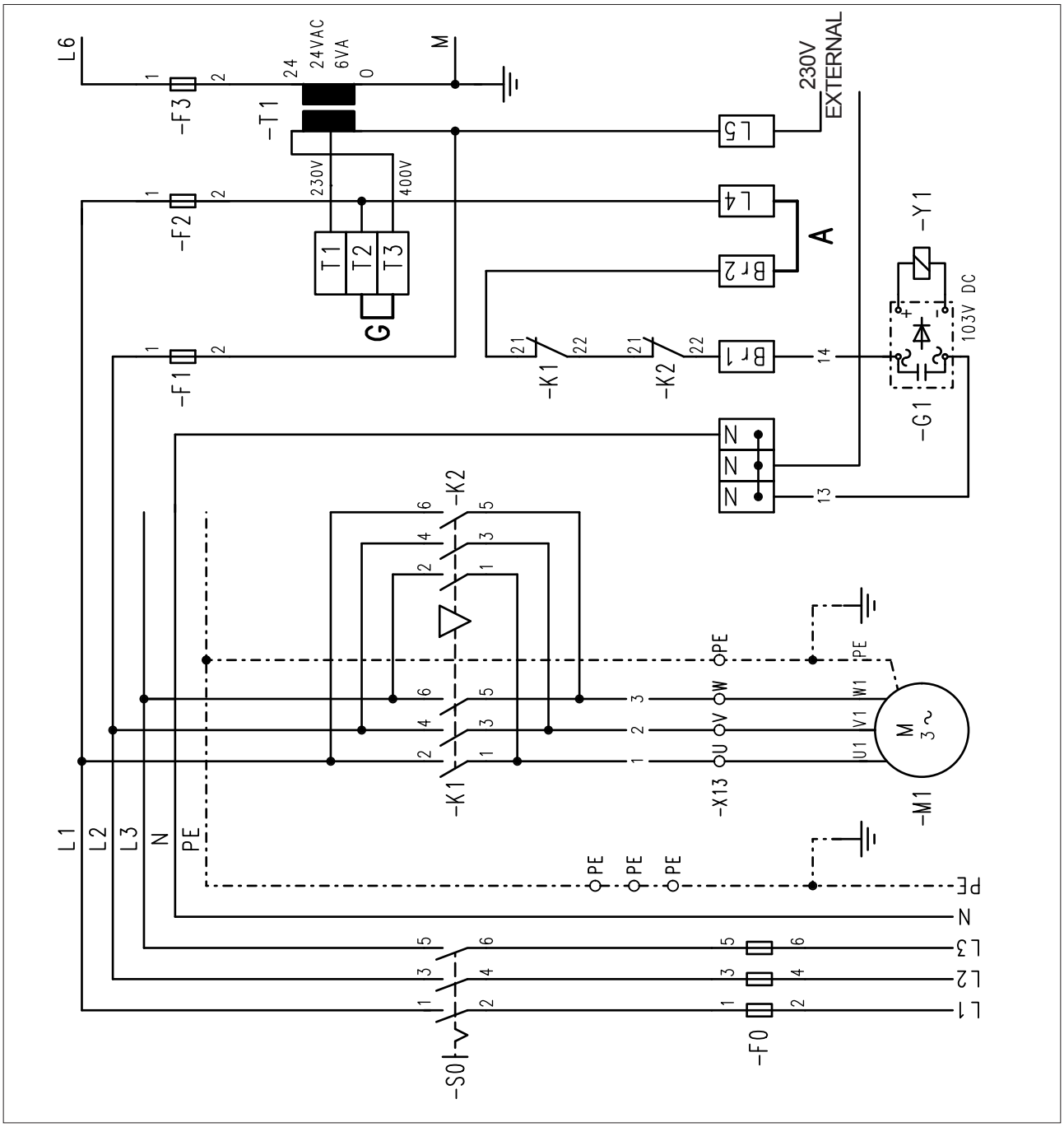
PRIMARY ELECTRICAL CIRCUIT 3 X 400V AC, N, PE
MAGNETIC BRAKE

52380104

F0 Fusing on the building supply side
F1 Control Fuse 0,5A / 6,3 x 32mm
F2 Control Fuse 0,5A / 6,3 x 32mm
F3 Control Fuse 0,5A / 5 x 20mm
F4 Thermal into motor coil
G1 Rectifier EGR Option
K1 OPEN Contactor
K2 CLOSE Contactor
M1 Three phase motor
S0 Main switch supply side
S1 Safety limit switch OPEN
S2 Safety limit switch CLOSE
S3 Limit switch OPEN
S4 Limit switch CLOSE
S5 Limit switch ADDITIONAL
S10 Manual interlock switch (OPTION)
S11 Built-in OPEN push-button
S13 Built-in CLOSE push-button
S14 Pushbutton OPEN / CLOSE
T1 Transformer 400V-230V / 24V AC
Y1 Magnetic brake 103V Option

X12 Limit terminals
X13 Motor Terminal Rail

1 = Wirenumber
2
1

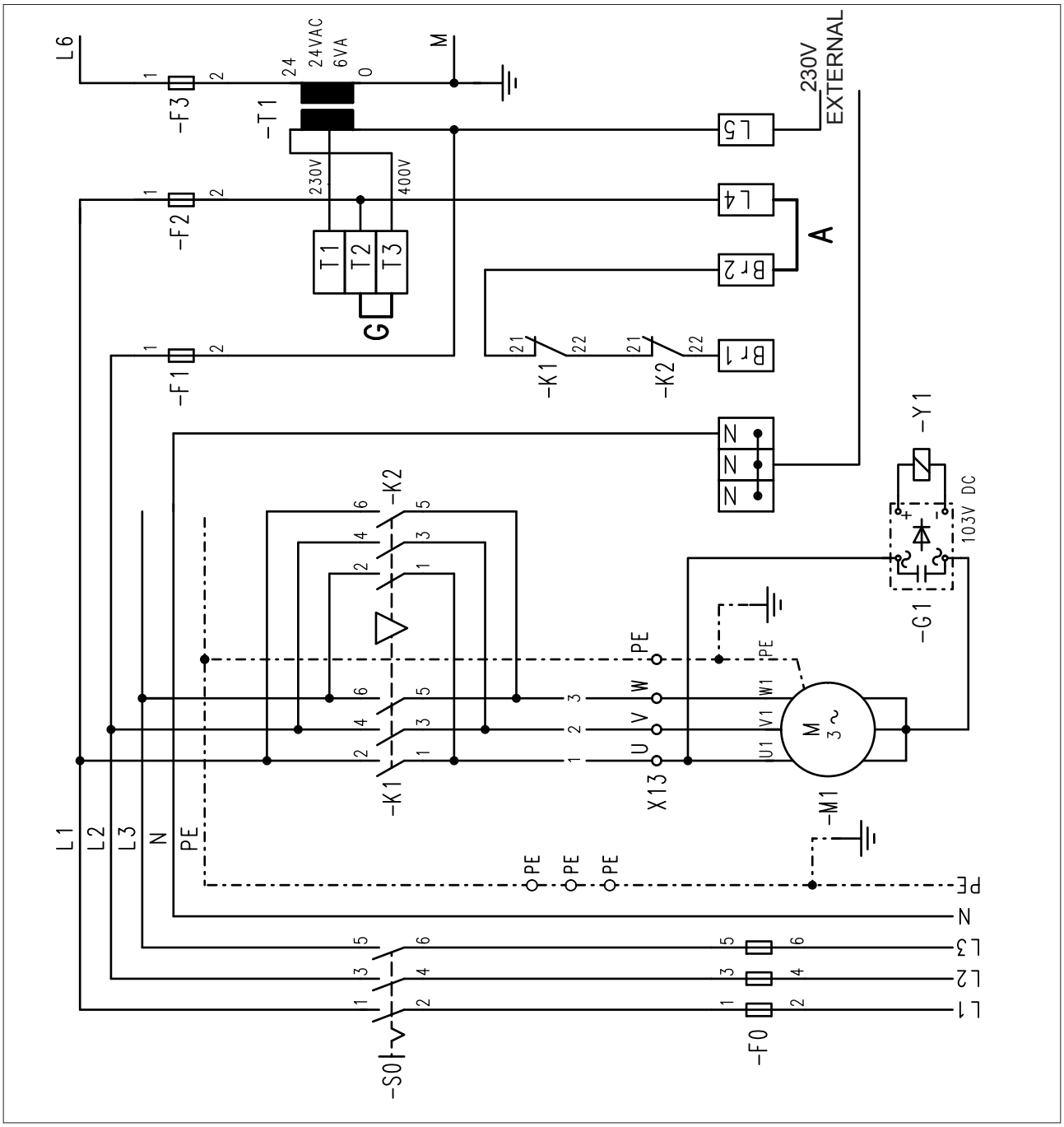


PRIMARY ELECTRICAL CIRCUIT 3 X 400V AC, N, PE
SPRING ASSISTED MAGNETIC BRAKE

52380129

F0	Fusing on the building supply side
F1	Control Fuse 0,5A / 6,3 x 32mm
F2	Control Fuse 0,5A / 6,3 x 32mm
F3	Control Fuse 0,5A / 5 x 20mm
F4	Thermal into motor coil
G1	Rectifier EGR Option
K1	OPEN Contactor
K2	CLOSE Contactor
M1	Three phase motor
S0	Main switch supply side
S1	Safety limit switch OPEN
S2	Safety limit switch CLOSE
S3	Limit switch OPEN
S4	Limit switch CLOSE
S5	Limit switch ADDITIONAL
S10	Manual interlock switch (OPTION)
S11	Built-in OPEN push-button
S13	Built-in CLOSE push-button
S14	Pushbutton OPEN / CLOSE
T1	Transformer 400V-230V / 24V AC
Y1	Spring assisted magnetic brake 103V Option
X12	Limit terminals
X13	Motor Terminal Rail

1	=	Wirenumber
2		



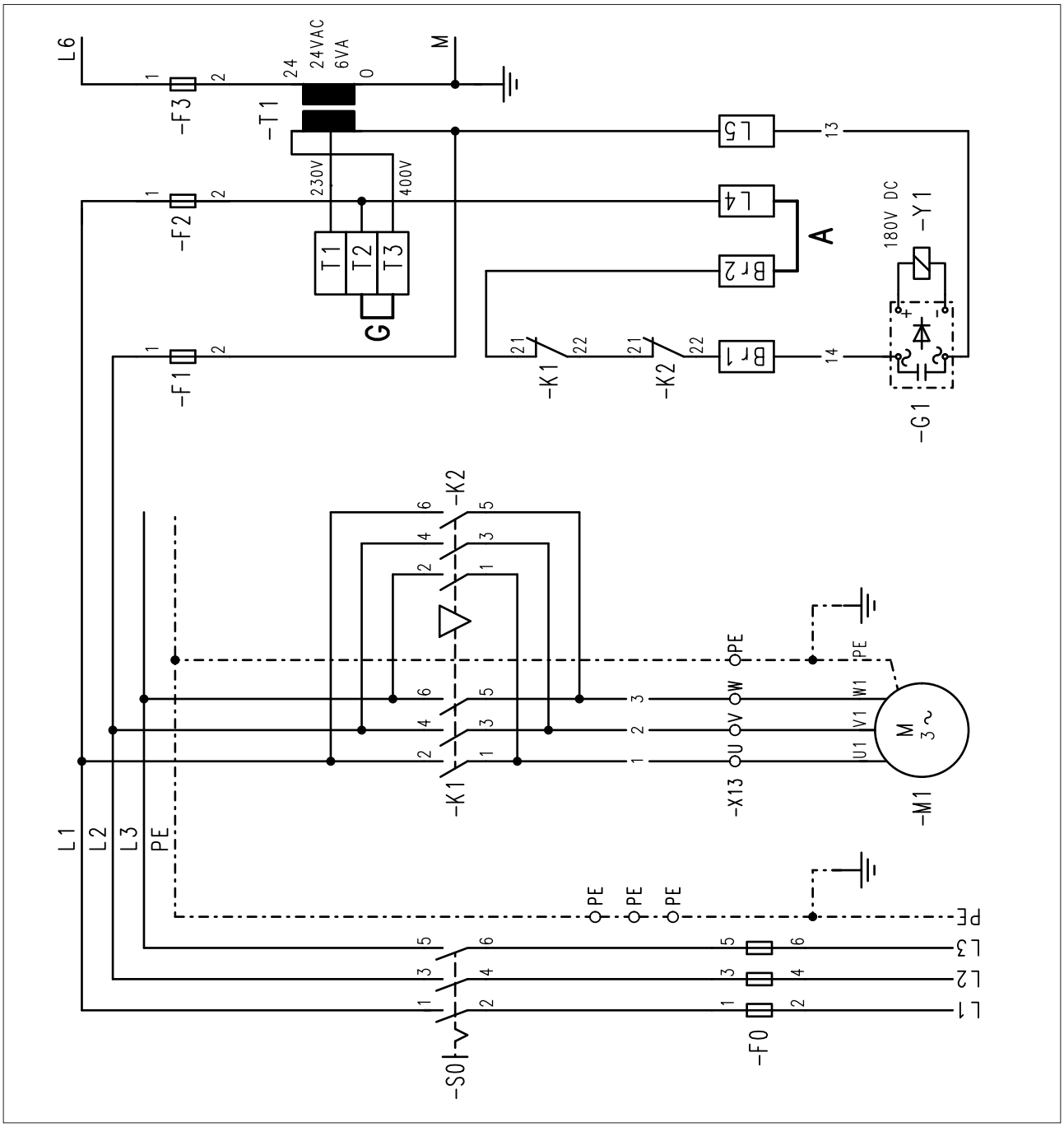
PRIMARY ELECTRICAL CIRCUIT 3 X 400V AC, PE MAGNETIC BRAKE

52380105

F0 Fusing on the building supply side
F1 Control Fuse 0,5A / 6,3 x 32mm
F2 Control Fuse 0,5A / 6,3 x 32mm
F3 Control Fuse 0,5A / 5 x 20mm
F4 Thermal into motor coil
G1 Rectifier EGR Option
K1 OPEN Contactor
K2 CLOSE Contactor
M1 Three phase motor
S0 Main switch supply side
S1 Safety limit switch OPEN
S2 Safety limit switch CLOSE
S3 Limit switch OPEN
S4 Limit switch CLOSE
S5 Limit switch ADDITIONAL
S10 Manual interlock switch (OPTION)
S11 Built-in OPEN push-button
S13 Built-in CLOSE push-button
S14 Pushbutton OPEN / CLOSE
T1 Transformer 400V-230V / 24V AC
Y1 Magnetic brake 180V Option

X12 Limit terminals
X13 Motor Terminal Rail

1 = Wirenumber

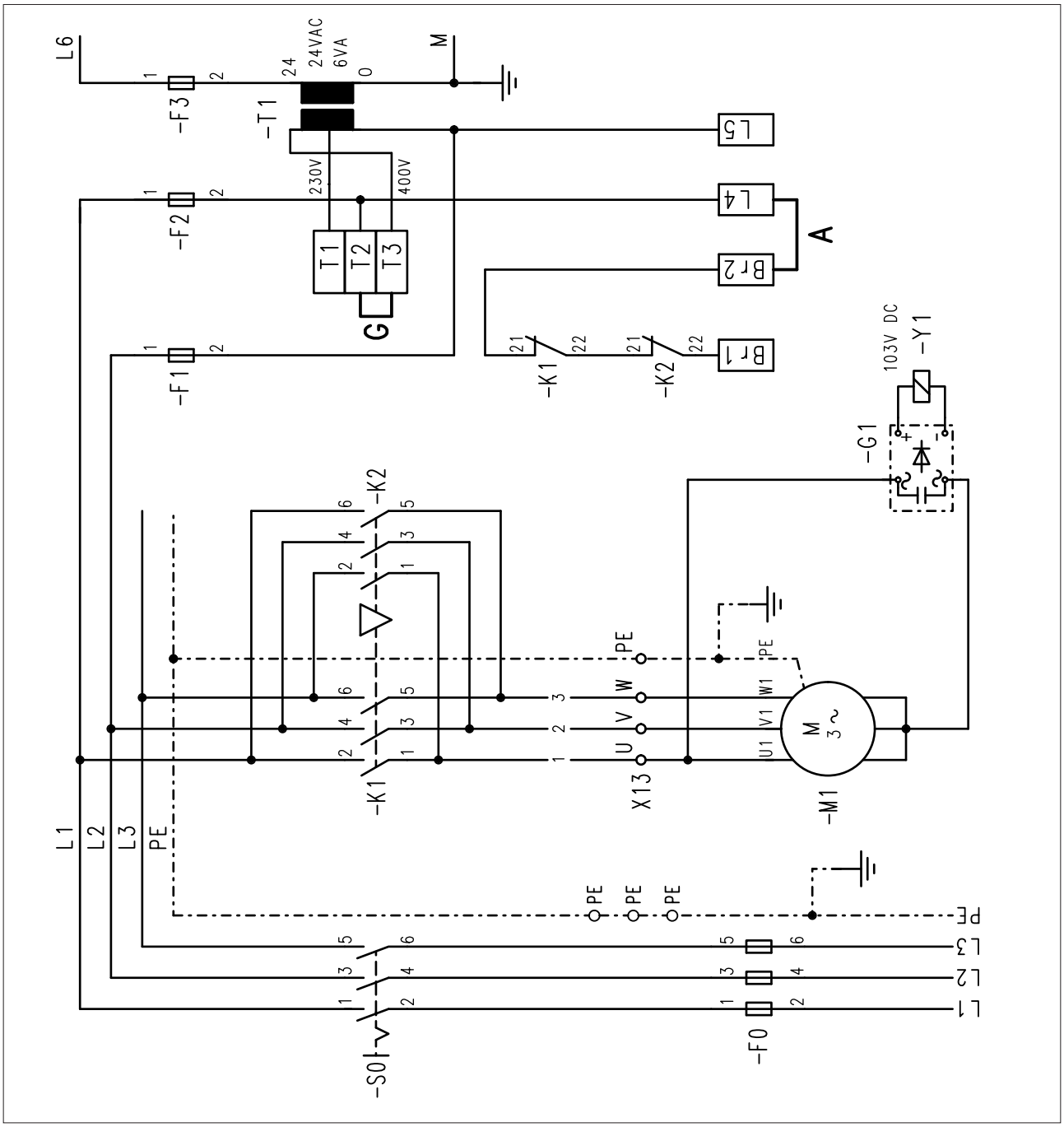


PRIMARY ELECTRICAL CIRCUIT 3 X 400V AC, PE
SPRING ASSISTED MAGNETIC BRAKE

52380130

F0	Fusing on the building supply side
F1	Control Fuse 0,5A / 6,3 x 32mm
F2	Control Fuse 0,5A / 6,3 x 32mm
F3	Control Fuse 0,5A / 5 x 20mm
F4	Thermal into motor coil
G1	Rectifier EGR Option
K1	OPEN Contactor
K2	CLOSE Contactor
M1	Three phase motor
S0	Main switch supply side
S1	Safety limit switch OPEN
S2	Safety limit switch CLOSE
S3	Limit switch OPEN
S4	Limit switch CLOSE
S5	Limit switch ADDITIONAL
S10	Manual interlock switch (OPTION)
S11	Built-in OPEN push-button
S13	Built-in CLOSE push-button
S14	Pushbutton OPEN / CLOSE
T1	Transformer 400V-230V / 24V AC
Y1	Spring assisted magnetic brake 103V Option
X12	Limit terminals
X13	Motor Terminal Rail

1	=	Wirenumber
2		



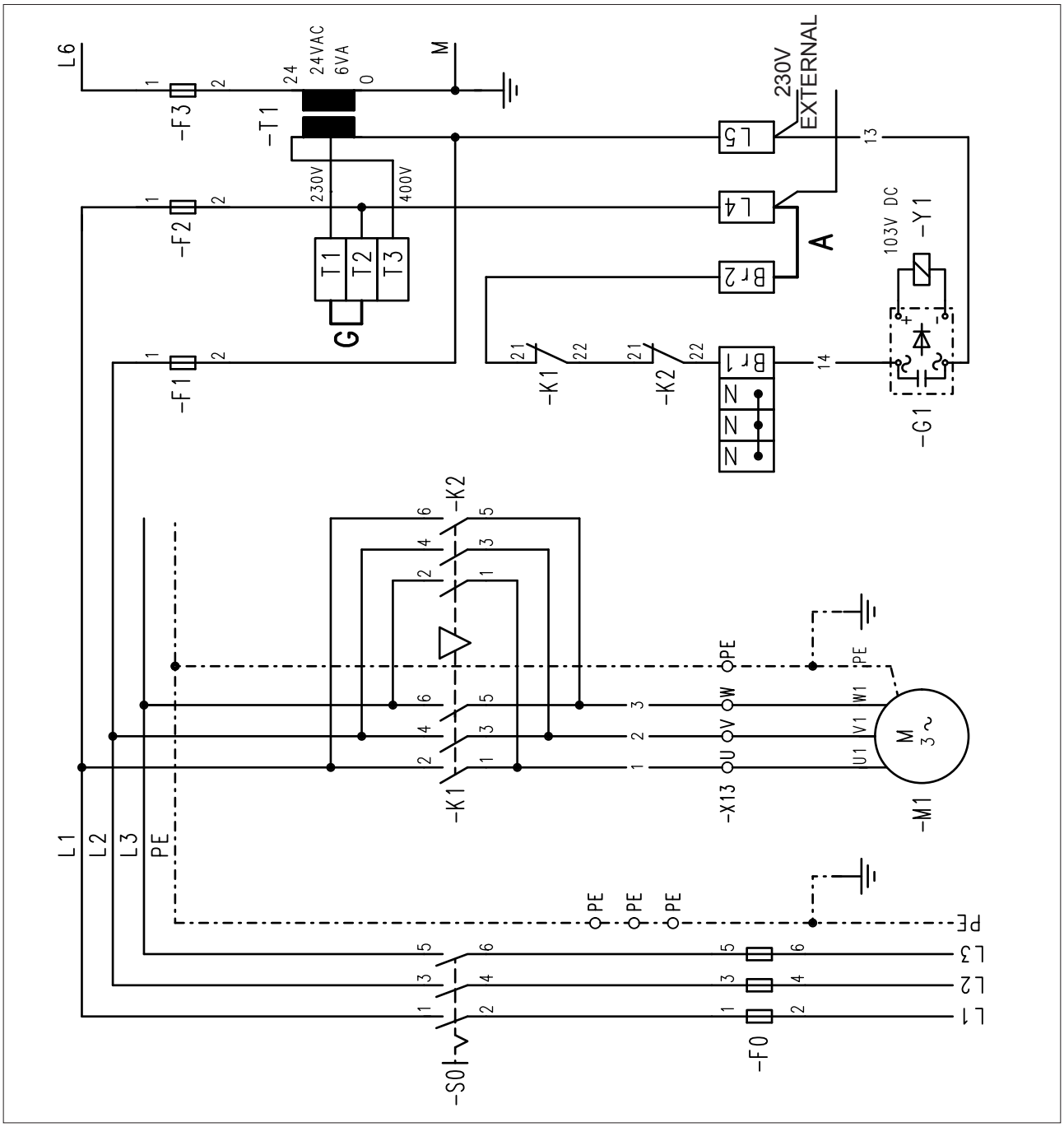
PRIMARY ELECTRICAL CIRCUIT 3 X 230V AC, PE MAGNETIC BRAKE

52380106

F0 Fusing on the building supply side
F1 Control Fuse 0,5A / 6,3 x 32mm
F2 Control Fuse 0,5A / 6,3 x 32mm
F3 Control Fuse 0,5A / 5 x 20mm
F4 Thermal into motor coil
G1 Rectifier EGR Option
K1 OPEN Contactor
K2 CLOSE Contactor
M1 Three phase motor
S0 Main switch supply side
S1 Safety limit switch OPEN
S2 Safety limit switch CLOSE
S3 Limit switch OPEN
S4 Limit switch CLOSE
S5 Limit switch ADDITIONAL
S10 Manual interlock switch (OPTION)
S11 Built-in OPEN push-button
S13 Built-in CLOSE push-button
S14 Pushbutton OPEN / CLOSE
T1 Transformer 400V-230V / 24V AC
Y1 Magnetic brake 103V Option

X12 Limit terminals
X13 Motor Terminal Rail

1 = Wirenumber

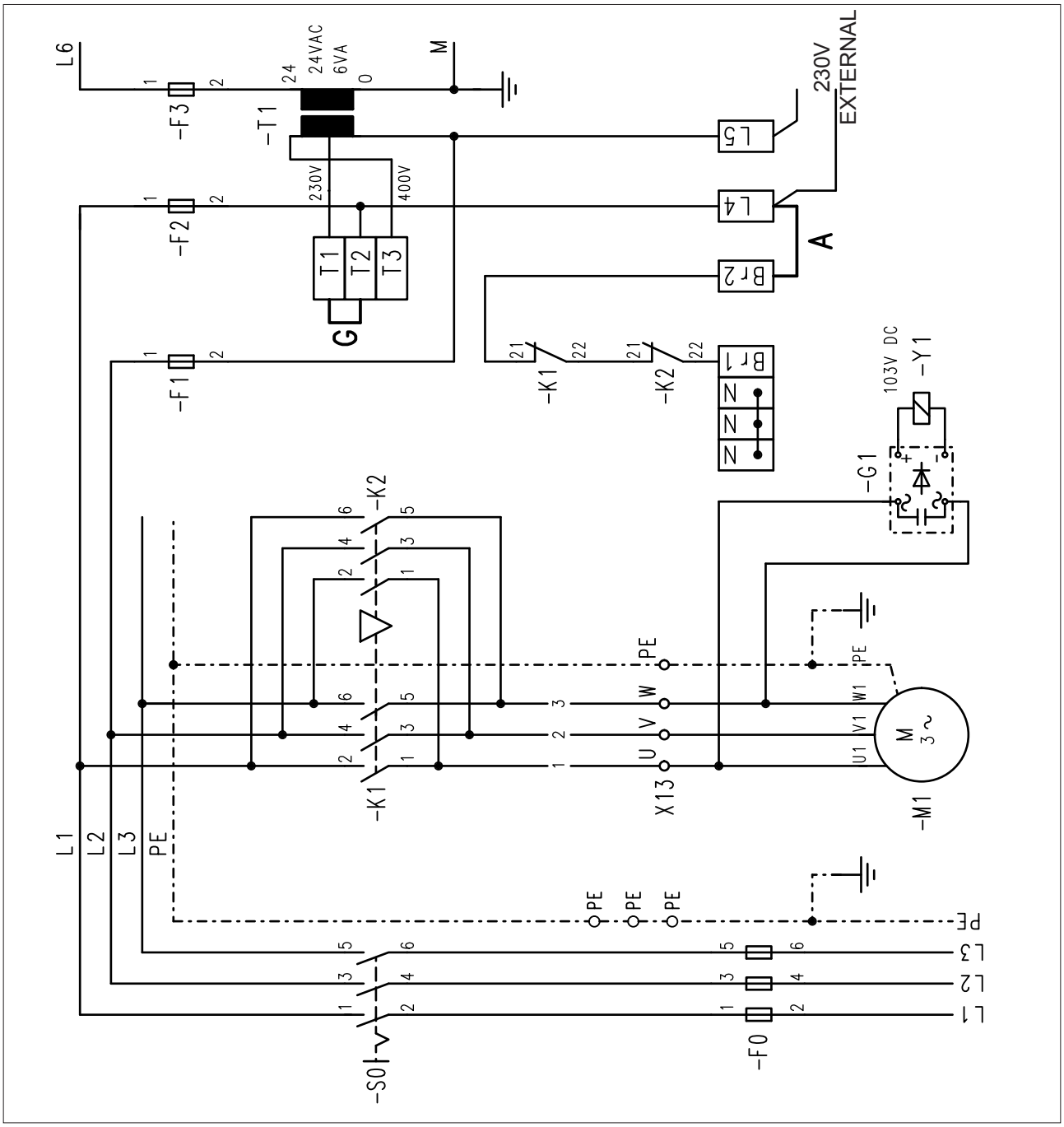


PRIMARY ELECTRICAL CIRCUIT 3 X 230V AC, PE SPRING ASSISTED MAGNETIC BRAKE

52380131

F0	Fusing on the building supply side
F1	Control Fuse 0,5A / 6,3 x 32mm
F2	Control Fuse 0,5A / 6,3 x 32mm
F3	Control Fuse 0,5A / 5 x 20mm
F4	Thermal into motor coil
G1	Rectifier EGR Option
K1	OPEN Contactor
K2	CLOSE Contactor
M1	Three phase motor
S0	Main switch supply side
S1	Safety limit switch OPEN
S2	Safety limit switch CLOSE
S3	Limit switch OPEN
S4	Limit switch CLOSE
S5	Limit switch ADDITIONAL
S10	Manual interlock switch (OPTION)
S11	Built-in OPEN push-button
S13	Built-in CLOSE push-button
S14	Pushbutton OPEN / CLOSE
T1	Transformer 400V-230V / 24V AC
Y1	Spring assisted magnetic brake 103V Option
X12	Limit terminals
X13	Motor Terminal Rail

1	=	Wirenumber
2		



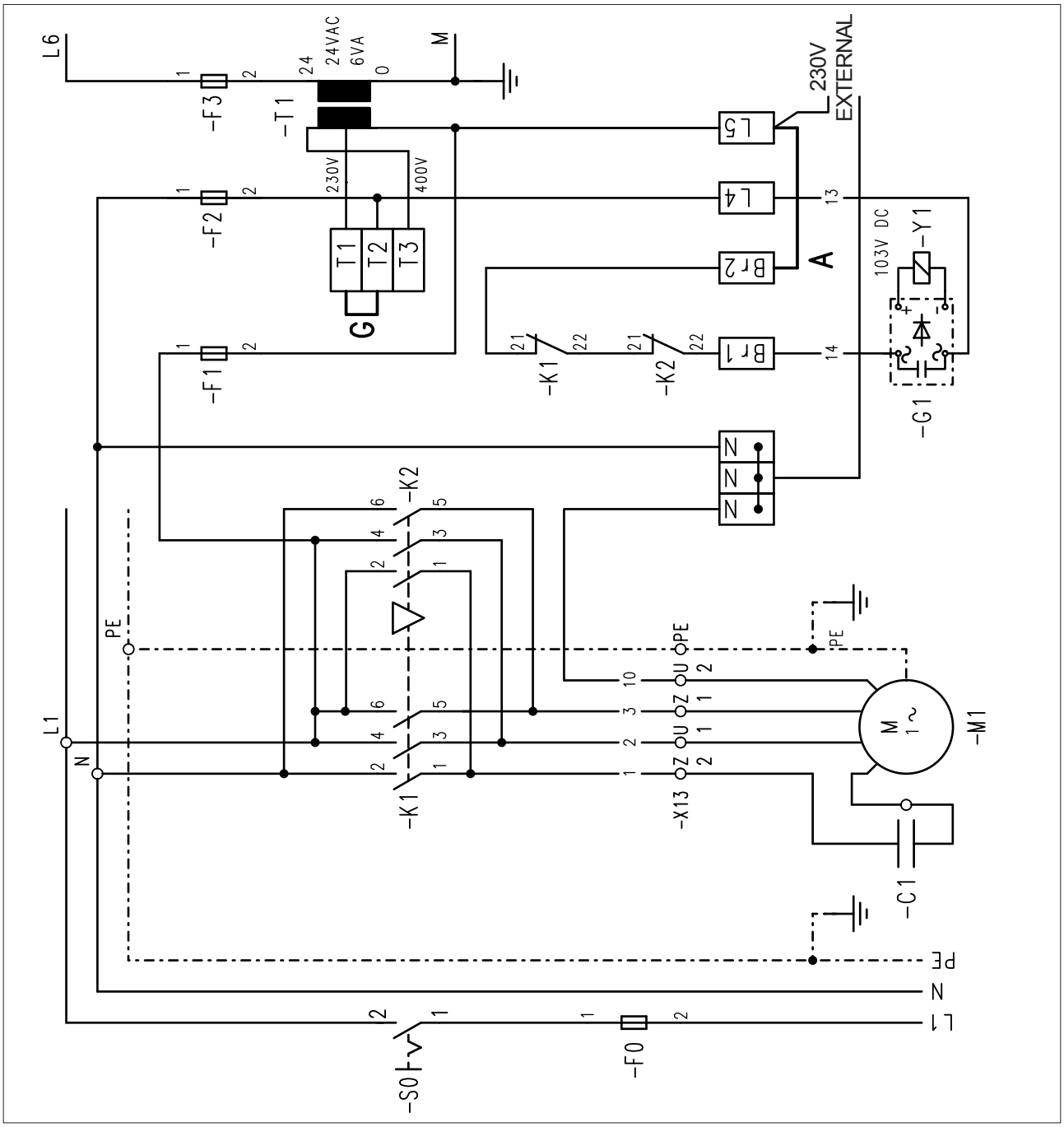
PRIMARY ELECTRICAL CIRCUIT 1 X 230V AC, N, PE
ASYMMETRIC WINDING

52380107

C1 Capacitor
F0 Fusing on the building supply side
F1 Control Fuse 0,5A / 6,3 x 32mm
F2 Control Fuse 0,5A / 6,3 x 32mm
F3 Control Fuse 0,5A / 5 x 20mm
F4 Thermal into motor coil
G1 Rectifier EGR Option
K1 OPEN Contactor
K2 CLOSE Contactor
M1 Single phase motor
S0 Main switch supply side
S1 Safety limit switch OPEN
S2 Safety limit switch CLOSE
S3 Limit switch OPEN
S4 Limit switch CLOSE
S5 Limit switch ADDITIONAL
S10 Manual interlock switch (OPTION)
S11 Built-in OPEN push-button
S13 Built-in CLOSE push-button
S14 Pushbutton OPEN / CLOSE
T1 Transformer 400V-230V / 24V AC
Y1 Magnetic brake 103V Option

X12 Limit terminals
X13 Motor Terminal Rail

1 = Wirenumber
2
1



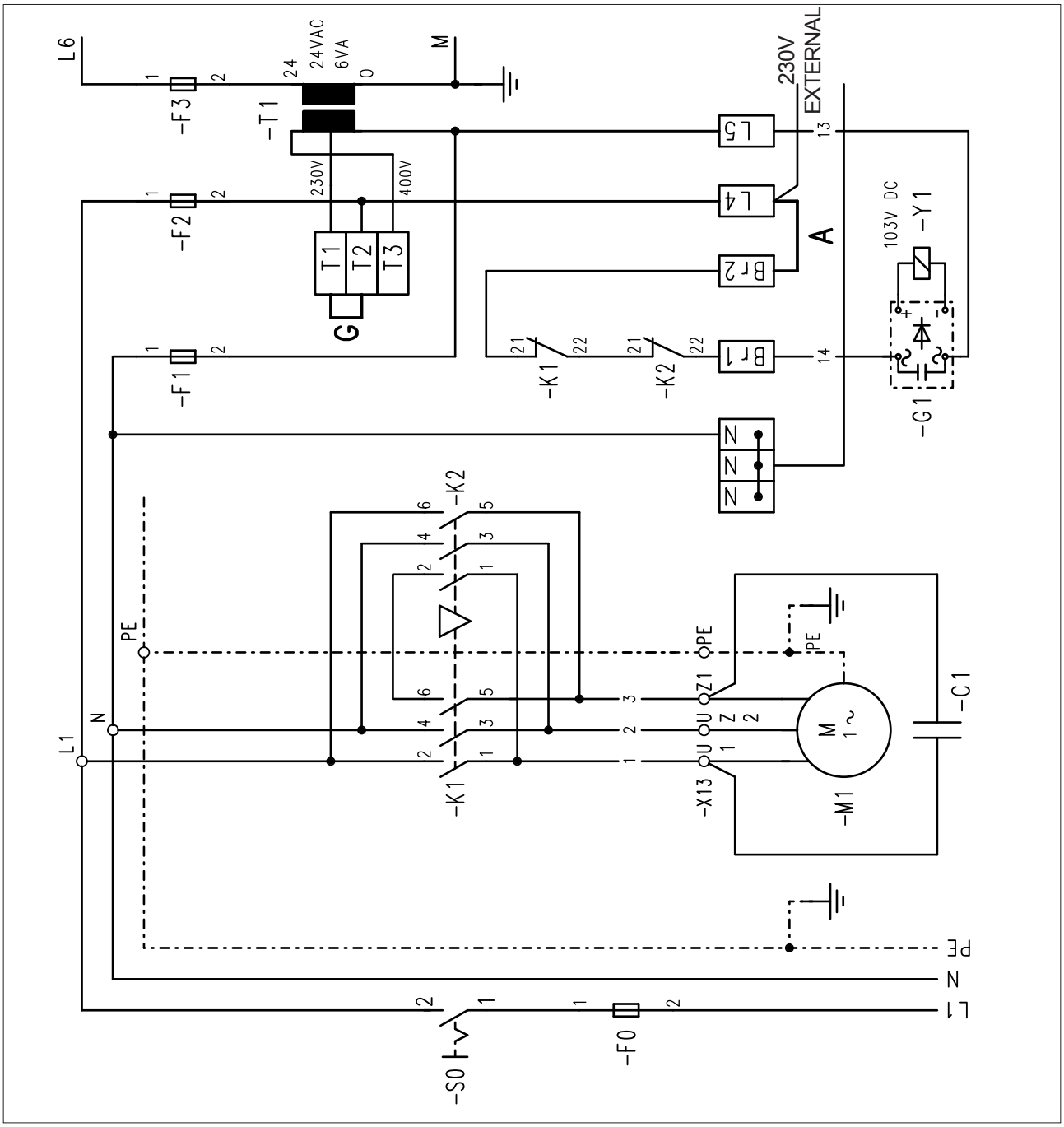
PRIMARY ELECTRICAL CIRCUIT 1 X 230V AC, N, PE SYMMETRIC WINDING

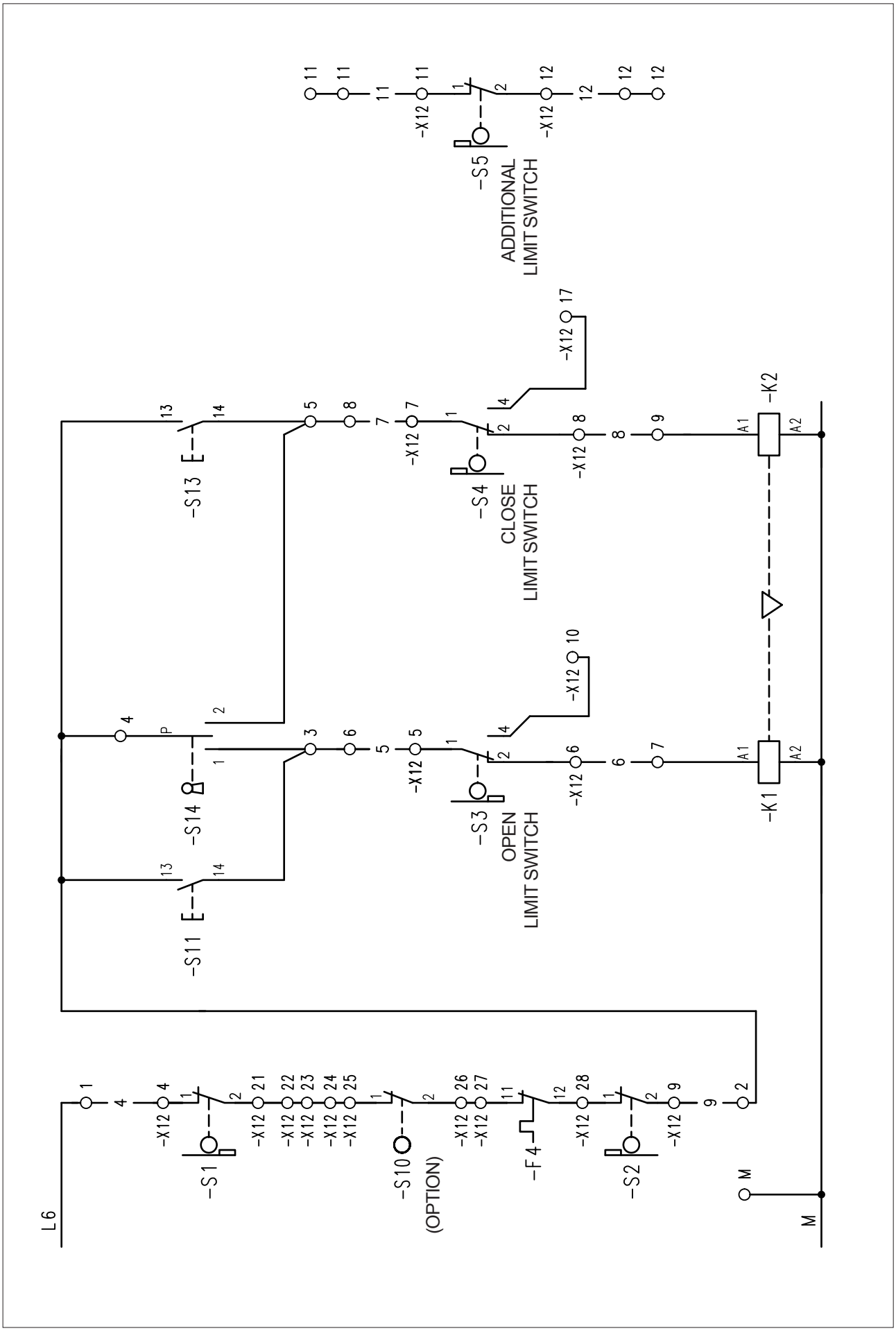
52380108

C1 Capacitor
F0 Fusing on the building supply side
F1 Control Fuse 0,5A / 6,3 x 32mm
F2 Control Fuse 0,5A / 6,3 x 32mm
F3 Control Fuse 0,5A / 5 x 20mm
F4 Thermal into motor coil
G1 Rectifier EGR Option
K1 OPEN Contactor
K2 CLOSE Contactor
M1 Single phase motor
S0 Main switch supply side
S1 Safety limit switch OPEN
S2 Safety limit switch CLOSE
S3 Limit switch OPEN
S4 Limit switch CLOSE
S5 Limit switch ADDITIONAL
S10 Manual interlock switch (OPTION)
S11 Built-in OPEN push-button
S13 Built-in CLOSE push-button
S14 Pushbutton OPEN / CLOSE
T1 Transformer 400V-230V / 24V AC
Y1 Magnetic brake 103V Option

X12 Limit terminals
X13 Motor Terminal Rail

1 = Wirenumber
2 = 1




L6
-S1
-S10
(OPTION)
-F4
-S2
M
-S14
-S11
-S13
-S3
OPEN
LIMIT SWITCH
-S4
CLOSE
LIMIT SWITCH
-S5
ADDITIONAL
LIMIT SWITCH
-K1
-K2
-X12

CONTROL DEVICES - TYPES OF CONNECTION

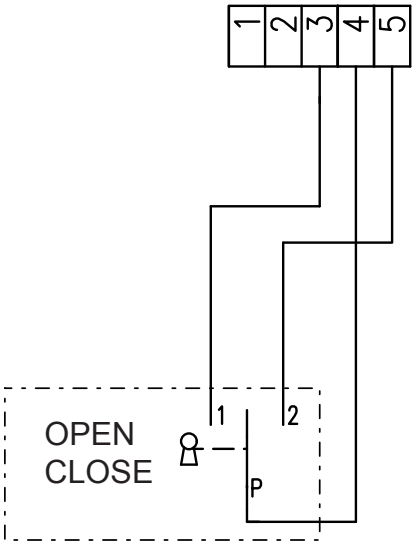
52315039

Connection type 1: Key switch DEADMAN - MODE

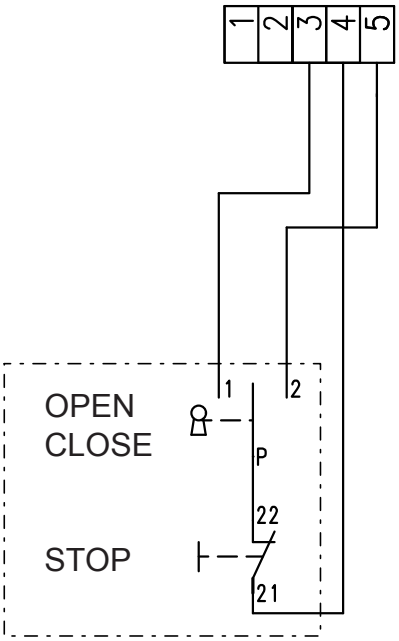
Connection type 2: Key switch with STOP BUTTON DEADMAN-MODE

Connection type 3: Reversing contactor 905 connected to TS 950

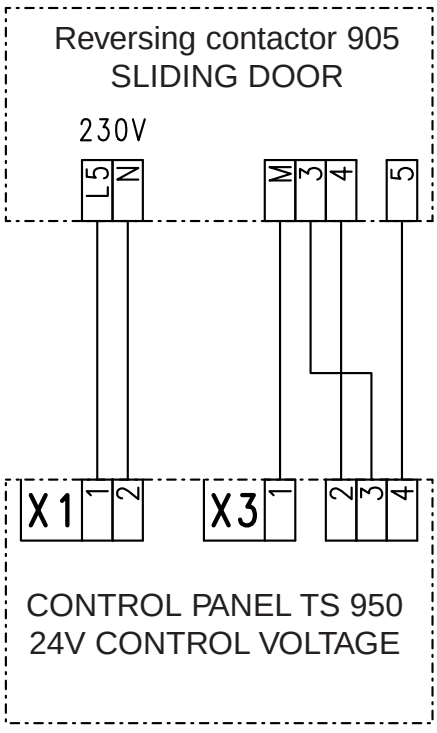
Connection type 4: Reversing contactor 905 connected to TS 951 TS 954



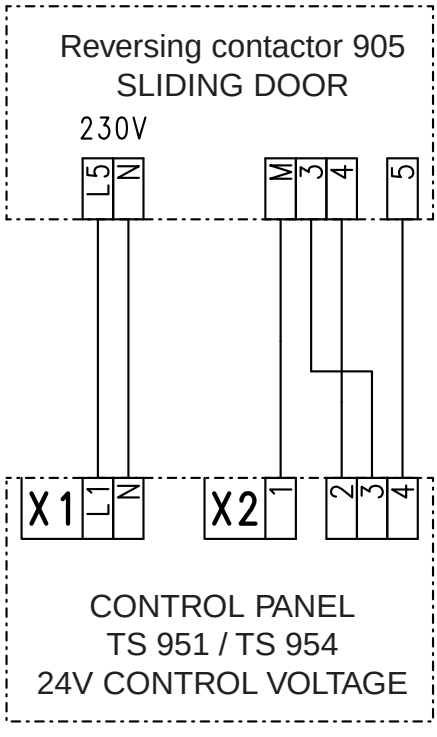
Connection type 1:



Connection type 2:



Connection type 3:



Connection type 4:

Fault Drive motor will not run and the contactors K1 or K2 will **not** pull in	
Possible cause	**Correction**
No voltage at the connecting terminals L1 / L2 / L3 three-phase motor L1 / N single-phase motor	Measure the voltage. Compare: three-phase motor single-phase motor L1 with N L1 with N L2 with N L3 with N Where there is no voltage, check the fusing and the power supply
Control fuse F3 defective	Check connected control devices (e.g. key-operated push-buttons) for earth faults and short circuits. After correcting faults, insert replacement fuse supplied.
Control fuse F1, F2 defective	Check connected magnetic brake and external devices ground fault and short circuit. When the fault is removed replace fuse.
Connecting screws on the connector or the terminal strips have become loose.	With the current switched off, check all connecting screws are tight and tighten where necessary.
Fault Drive motor will not run and the contactors K1 or K2 will pull in	
Possible cause	**Correction**
When friction clutch is not adjusted	Adjust friction clutch.
The magnetic brake do not open when electrical motor is running	Check whether the magnetic brake is without supply when the electrical motor is running
Defect in the door mechanism	Check door mechanism