

User Manual

Compulsory Mixers

M 50 – M 550



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Contents	Page
I. Terminology and marking.....	2
II. Field of application	2
III. Working principle.....	2
IV. Machine description	3
V. Technical data.....	6
VI. Material	7
VII. Manufacturing	7
VIII. Marking	7
IX. Testing	8
X. Takeover and delivery.....	8
XI. Packaging, transport and storage	8
XII. Warranty	9
XIII. Service maintenance.....	9
XIV. Operation and maintenance manual	10
XV. Enclosures	17

I. Terminology and marking

Example: M 250H/7,5
M 80/400

M	basic machine marking (mixer)
250	size of the type of mixer
H	heavy-duty mixer design
/7.5	electromotor power input in kW
/400	operating voltage in V (for M 50 and M 80)

Manufacturer

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II. Field of application

Compulsory (cyclone) mixers are designed to mix wet, moist and dry mixtures in the construction industry, in the metallurgic and foundry industries, for the industrial mixing of materials, etc. Their main advantage is the perfect mixing of individual mixture components within a short period of time (mixing speed is 4-5 times faster than that of the standard drum mixer), which provides the high quality of the final mixture.

III. Working principle

Compulsory mixers work on the principle of mixing arms rotating at high speed around the inner axis of the static mixing tank. The mixing is done by several arms which simultaneously ensure that the mixture is wiped off the sides and the bottom of the mixing tank. The mixing arms are side and height-adjustable and can be equipped with rubber spatulas. The basic model consists of one three-arm fork whose rotation provides the resistance of the mixed mixture (mixer blades I / mixer blades II). The thorough mixing of heavy refractory mixtures requires specially designed raking blades or mixer blades I.

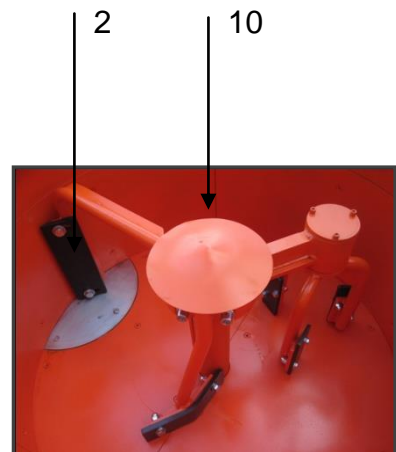
The mixture is filled through the screen in the cover of the mixer. The screen is fitted with a separating comb for packaged materials. The construction of the cover prevents material spillage over the sides of the tank. If need be, the mixer can be provided with covering sheet metal preventing the leak of thinner or dusty mixtures. The prepared material is emptied by turning the movable discharge segment on the tank bottom.

IV. Machine description

A. Standard construction with wheels

Main parts:

- Tank [1]
- Lower stopper [2]
- Electric control [3]
- Wheels [4]
- Height adjustable frame [5]
- Grab handle [6]
- Drive [7]
- Position switch [8]
- Upper cover with separating comb [9]
- Mixing unit [10]



Mixer blades I



Mixer blades II

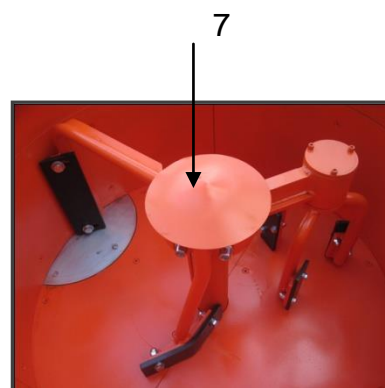


Raking blades

B. Heavy-duty mixer construction (type H)

Main parts:

- Tank [1]
- Lower stopper [2]
- Electric control [3]
- Post [4]
- Drive [5]
- Upper cover [6]
- Mixing unit [7]



Mixer blades H-I



Raking blades H-I



Raking blades H-II

Description

The mixing tank is firmly connected to the stand that can be equipped – in case of models M 50 – M 250 – with wheels. The M 50 – M 180 mixer models are fitted with height adjustable posts allowing for the variable height of discharging.

The drive of the mixing arms is ensured by a low-maintenance, worm or front-cone electric gear unit. The smallest types of mixers (M 50/230V, M 50/400V and M 80/230V) are fitted with a maintenance-free electric gear unit.

Mixer controls are on the mixer frame and consist of a motor starter with a stop button. Electric supply is led to a 16A or 32A coupler plug next to the starter.

The machine is put into operation by pressing the button START. The machine is stopped by pressing the button STOP. In case of emergency, the machine can be switched off by the emergency stop button TOTAL STOP (red button). Models with a motor output of 5.5 kW and higher can be equipped with a soft starter that facilitates the continual start-up of the mixer.

The mixer is also fitted with a position switch that disconnects an operating machine from the mains supply in the event that the cover opens during operation. Simultaneously, the position switch prevents the machine from starting with an opened cover. The no-voltage release protects the machine from re-starting in case of power failure and its subsequent restoration.

The models designed to mix abrasive materials have a mixing tank that is lined with replaceable standard or abrasion-proof material up to its utility mixing height. Alternatively, the mixing tank is made of abrasion-proof material.

Mixers with a firm frame are provided with lifting attachments for transport by a high-lift truck or a crane.

V. Technical data

Technical parameters

Model	Tank volume	Max. utility volume	Motor output	Voltage	Current supply	Stirrer revolutions	Gear unit	Mixing drum *	Max. grain size	Weight **
	[l]	[l]	[kW]	[V]	x	[rev/min]	x	x	[mm]	[kg]
M 50/230	74	37	1,5	230	16 A	47	S	•/•/•/•	4	96
M 50/400	74	37	1,5	400	16 A	47	S	•/•/•/•	4	95
M 80/230	111	69	1,5	230	16 A	47	S	•/•/•/•	4	131
M 80/400	111	69	2,2	400	16 A	50	S	•/•/•/•	6	137
M 125/2.2	162	102	2,2	400	16 A	50	S	•/•/•/•	8	147
M 125/3	162	102	3	400	16 A	47	S	•/•/•/•	8	177
M 125/4	162	102	4	400	16 A	47	S	•/•/•/•	8	187
M 180/2.2	233	148	2,2	400	16 A	50	S	•/•/•/•	8	172
M 180/3	233	148	3	400	16 A	47	S	•/•/•/•	8	202
M 180/4	233	148	4	400	16 A	47	S	•/•/•/•	8	212
M 250/4	330	208	4	400	16 A	47	S/K	•/•/•/•	8	270/290
M 250/5.5	330	208	5,5	400	16 A	36 (47)	K	-/•/•/•	8	390
M 250H/7.5	487	246	7,5	400	32 A	30	K	-/•/•/•	32	605
M 400H/7.5	646	400	7,5	400	32 A	30	K	-/•/•/•	32	700
M 450H/9.2	966	450	9,2	400	32 A	30	K	-/•/•/•	32	820
M 550H/11	1035	550	11	400	32 A	32	K	-/•/•/•	32	1105
M 550H/15	1035	550	15	400	32 A	32	K	-/•/•/•	32	1290

Note:

S – worm gear unit

K – helical bevel gearbox

* Mixing drum manufacturing:

•/-/-/- Standard metal sheet

-/•/-/- Abrasion-proof metal sheet

-/-/•/- Sheet metal lining

-/-/-• Abrasion-proof lining

** Weight of the Standard model; in case of the “H” models weight with replaceable lining

Feeding system:

2P + PE, 230V~ 50Hz

3NPE ~ 50Hz, 400V/TN-S

Permissible variation of feeding voltage:

± 10 %

Working environment temperature:

+ 5° ÷ 40°C

Types of external influences according to CSN 33 2000-3

- environment

AA5, AB5, AE6, AF2

- use

BA4, BE1

VI. Material

The products are made of material whose composition and mechanical properties comply with production documentation.

VII. Manufacturing

All parts are made in accordance with production drawings. Out-of-tolerance dimensions follow CSN ISO 2768-1.

Electric wiring is completed in accordance with CSN EN 60204-1. Protection from dangerous contact voltage is secured by automatic disconnection from the mains.

The parts are metal coated according to production documentation and CSN EN 12329. The contact surface of the parts without metal coating is painted with a primer before assembly.

The joints are carried out in accordance with drawing documentation and CSN EN ISO 9692-1.

The surface finish, coat, and colour hues are in accordance with documentation – the coat is 100 µm thick. The surface finish of the product provides resistance up to the 3rd degree of environment corrosiveness; the coat complies with ISO 3864.

VIII. Marking

The machine is provided with a production plate reading this information:

- Manufacturer
- Machine type marking
- Production number
- Electric motor power input
- Weight

Note: The electric motor with a gear unit has its own identification plate.

IX. Testing

Machine dimensions are checked by the manufacturer according to production drawings.

Machine properties are checked by means of a functional test, including the operation of the drive and of the stirrer and the operation of the lower stopper.

Upon the customer's explicit request, a supplied mixture undergoes a stirring test after agreement with the manufacturer.

The completion of tests is confirmed by a product quality and completeness certificate.

X. Takeover and delivery

Takeover

Takeover in the production plant takes place only if requested by the customer.

Delivery

The machine is supplied assembled and with accompanying documentation consisting of:

- User manual
- Quality and completeness certificate
- Initial inspection of electric equipment
- Conformity statement

XI. Packaging, transport and storage

Packaging

The machine is supplied unpacked or on a palette. The cost of packaging is borne by the customer (non returnable packaging).

Transport

Transport is secured by standard means of transportation. The proper fastening of the cargo in transport is the responsibility of the carrier.

Storage

The machine must be stored in a place that is protected from bad weather, excessive moist, alkaline vapors, oil and mould.

XII. Warranty

The warranty period is 6 months from the date of sale; spare parts are covered with a 3-month warranty.

The manufacturer does not provide any warranty:

- If the machine is used for purposes and in a manner other than as stated in the User Manual;
- If the machine is not take care of properly (wrong storage, assembly, operation, maintenance, etc.);
- If the machine was modified, interfered with or repaired without the manufacturer's prior consent;
- If the machine was damaged owing to wrong electric wiring on the customer's site;
- If the machine was damaged by a third person or due to the acts of God;
- If a complaint is filed without presenting a warranty certificate (the quality and completeness certificate);
- If the machine is worn excessively due to the application of highly abrasive mixtures (on the parts worn through regular operation – tank, lining and blades).

XIII. Service maintenance

Service maintenance is carried out by the manufacturer according to the terms and conditions agreed upon in a purchase agreement, or – as the case may be – in an additional agreement made with the customer in writing.

XIV. Operation and maintenance manual

Service

- The mixer may only be operated by people who are familiarized with the user manual and have the knowledge required to prepare wet and dry mixtures used in the building industry, mining industry and metallurgy.
- Only fill the mixing drum with materials suitable for the preparation of concrete and mortar or similar.
- Use the mixer only when the filling cap and screen are closed. For mixers fitted with a cover cap, this cap must be closed!
- Check the condition of the machine and the electric installation before each commissioning! If any defect is ascertained, the mixer must not be used until all defects are removed.
- Use the mixer only with complete and undamaged protective aids.
- The operator is responsible for any other people located nearby the running mixer.
- In the workplace local operating safety regulations must be kept and safety regulations complied with in accordance with hygiene standards
- Keep the engine and electrical installation dry and clean. Under no circumstances should these components be sprayed with water!

ATTENTION

- Rotating mixing tools.
- Do not touch the mixing drum while the machine is in operation!
- Make sure the mixing drum rotates in the correct direction (direction of the arrow above the mixer outlet)!
- If the mixing equipment becomes blocked, immediately disconnect the engine!

Maintenance

- Before starting maintenance or repair, the mixer must be disconnected from the network and reliably secured against accidental activation.
- If the machine is to be disconnected for a long period, it must be fully cleaned and protected against corrosion.
- The maintenance and repairs of electric wiring can be performed only by an employee with qualifications according to national regulation for working with low voltage devices.
- For repair, use only the original spare parts.

Field of application

The machine is designed to mix wet, moist and dry mixtures in the construction industry, in mining, in the foundry industry, etc.

The user is obliged to make sure that the machine is operated in accordance with Act No. 258/2000 Sb. on the protection of public health.

Operation

The operation and maintenance of the machine can be performed only by an employee familiar with the User Manual.

Working procedure applicable to the use of the machine without frequency inverter:

- Set the mixer in a horizontal position in the place of its future operation and connect it to the mains supply.
- Start the machine briefly by pressing the button START (stop the machine by pressing STOP) to check the sense of the stirrer's rotation – **the correct direction is marked with a black arrow on the tank!**
- For the control box with the left/right running option, the mixer is activated by the RIGHT button, depending on the running corresponding to the marked arrow.
- Close the lower discharge stopper and fill the tank with an appropriate mixture through the closed cover with a screen, adding mixing water as need be.
- While the mixer is on, the filling cover with a screen must be closed. Mixers fitted with a covering lid can be operated only when this lid is closed too!
- When opening the cover the terminal switch secures the stopping of the stirrer!

- Start the machine by pressing the button START (or LEFT/RIGHT). Stop the machine by pressing the button STOP. In case of emergency push the emergency button TOTAL STOP (red button). The control of the machine fitted with a soft starter is described below.
- When the mixture has been stirred thoroughly, open the lower stopper and empty the mixture into a previously prepared container. If the consistency of the mixed material prevents emptying the mixer, run the mixer with the lower closure open– **do not interfere with the mixer drum!**

Maintenance – after operation

When you have finished working, rinse the residual mixed mixture out of the mixer tank using pressure water.

Maintenance includes:

- full cleaning of the mixer, vessel and outlet,
- maintenance of the clean groove in the closure,
- keeping the switchboard and the engine dry and clean,
- checking that the mechanical parts of the mixer are not damaged,
- checking that the electrical installation and engine are not damaged.

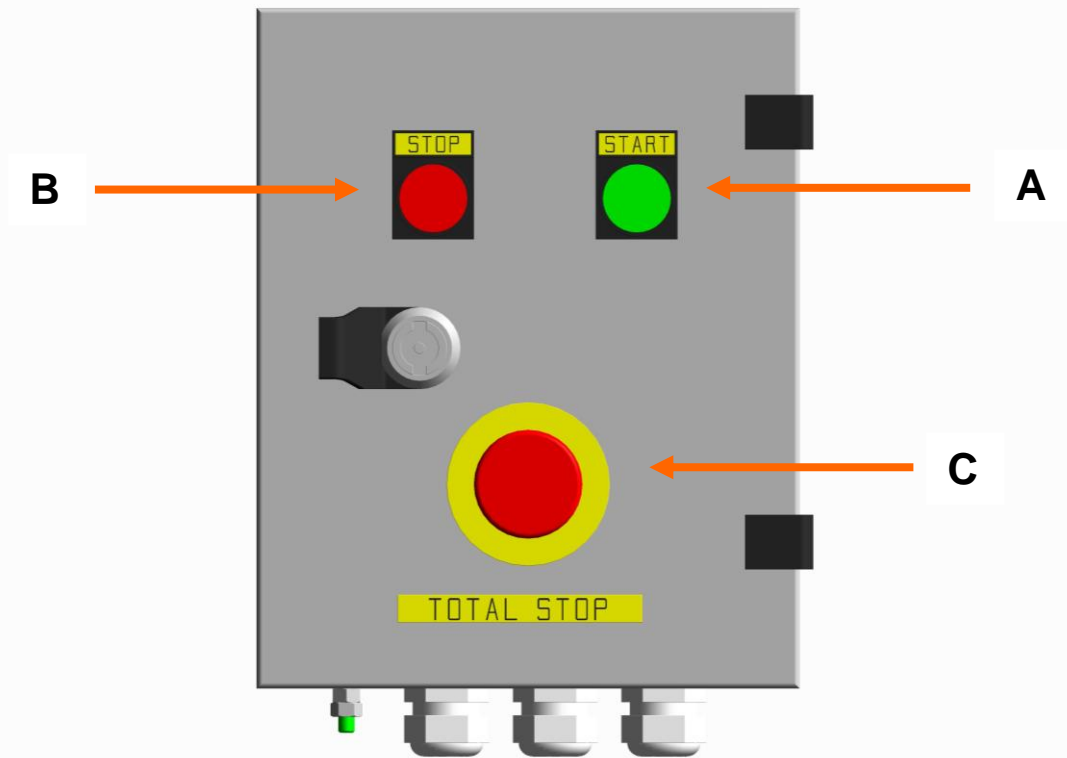
Lubrication

The gear units of the mixers are filled with synthetic oil.

Mixer type	Oil amount (l)	Oil type	Oil fill service life
M 50/230	X	X	Maintenance-free
M 50/400	X	X	Maintenance-free
M 80/230	X	X	Maintenance-free
M 80/400	1.2	AGIP Tellium VSF 320 KLUGEL Syntheso D220EP SHELL Tivela Oil WB MOBIL Glygoyl 30 SHC630	25,000 operating hours or a maximum of 3 years
M 125/2.2	1.2		
M 125/3	2.8		
M 125/4	2.8		
M 180/2.2	1.2		
M 180/3	2.8		
M 180/4	2.8		
M 250/4	2.8		
M 250/5.5	6.5		
M 250H/7.5	8.2		
M 400H/7.5	8.2		
M 450H/9.2	8.2		
M 550H/11/15	18.0		

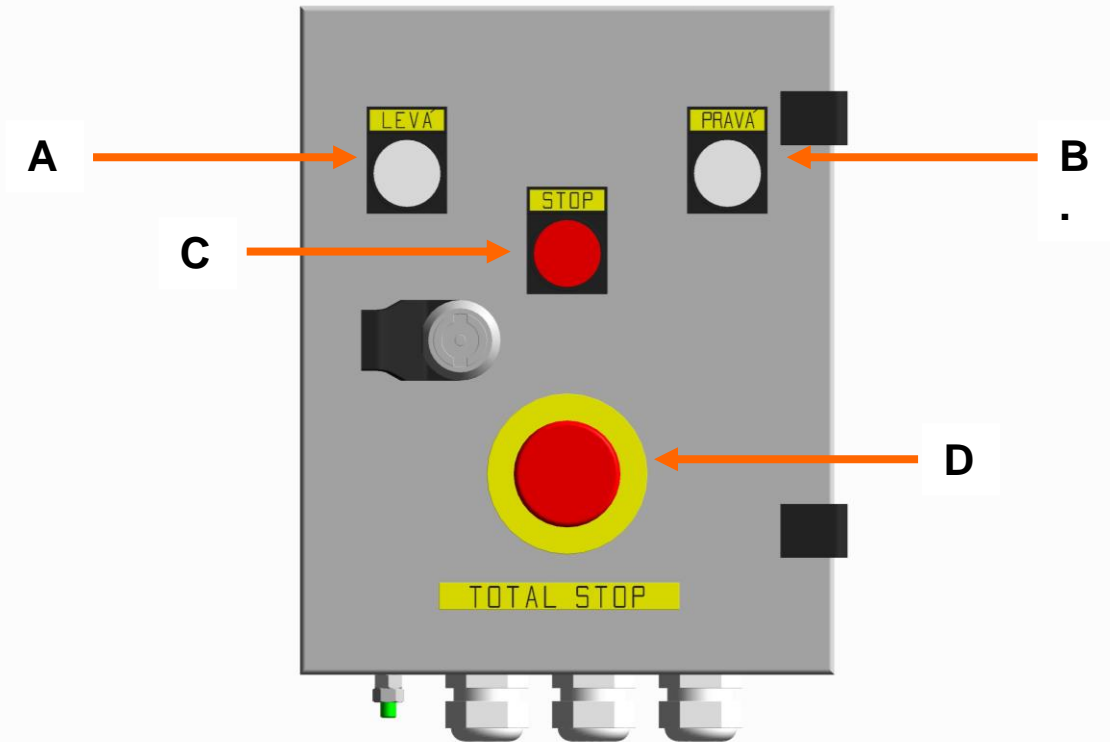
Control Box I

- A) Button START
- B) Button STOP
- C) Emergency Button TOTAL STOP



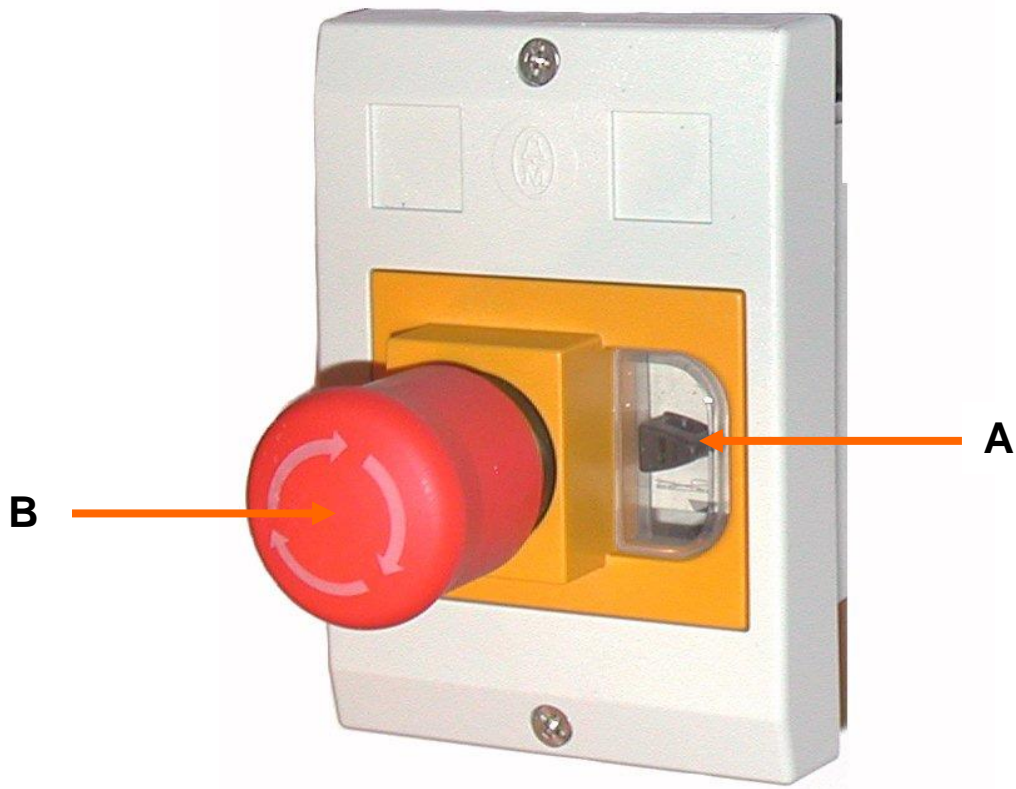
Control box II

- A) Button LEFT
- B) Button RIGHT
- C) STOP button
- D) Emergency stop button TOTAL STOP



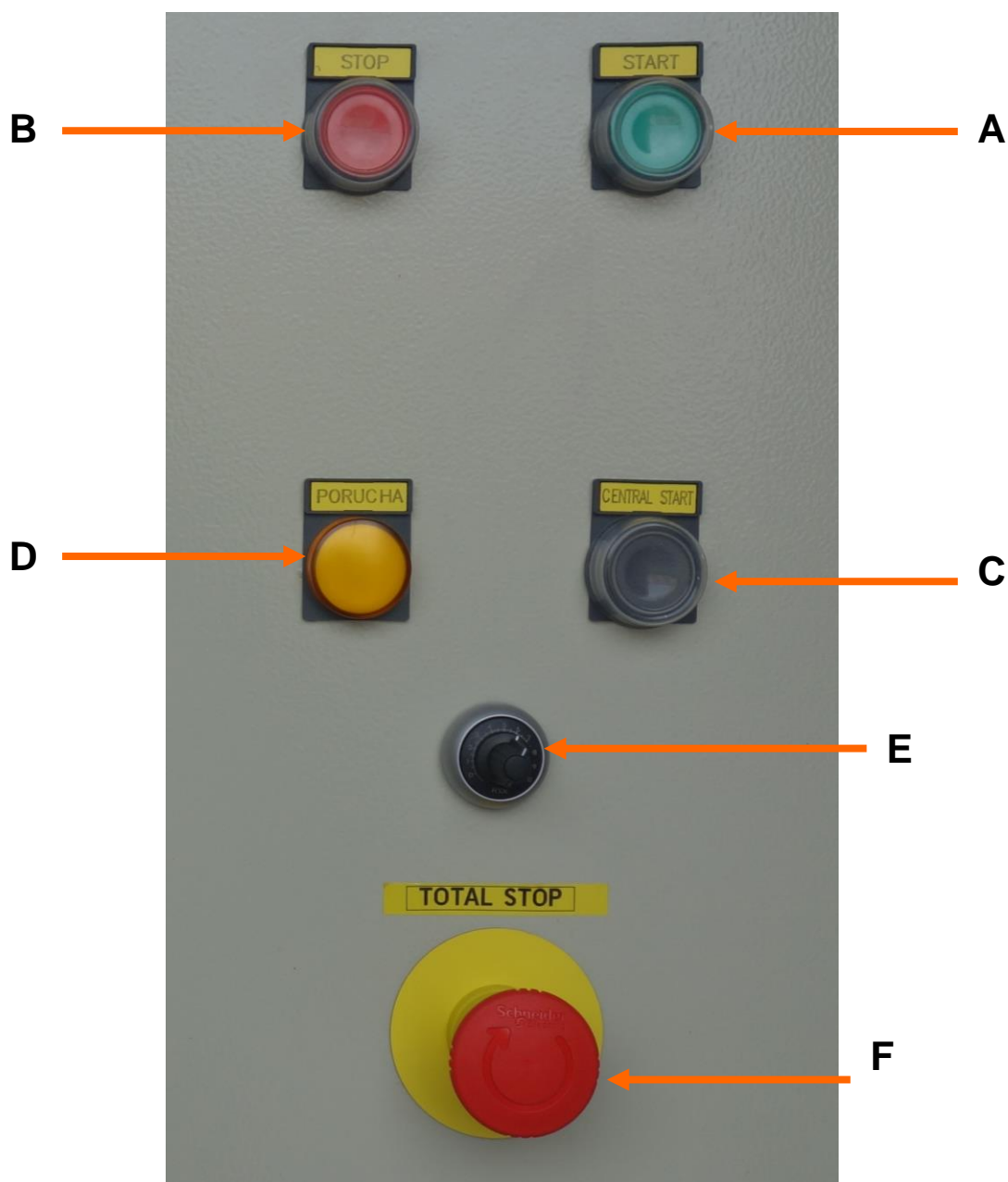
Control box III

- A) Button START
- B) Button STOP/ Emergency stop button TOTAL STOP



Control box IV

- A) Button START
- B) Button STOP
- C) Button CENTRAL START
- D) Signaling of DAMAGE
- E) Potentiometer – speed regulation
- F) Emergency stop button TOTAL STOP



XV. Enclosures

- 1) Table of main dimensions
- 2) Electric control chart – 1-revolution motor
- 3) Electric control chart – 1-revolution motor with softstarter Schneider brand
- 4) Electric control chart – 1-revolution motor with softstarter ABB brand
- 5) Electrical control chart – 1-revolution engine L/R running
- 6) Electric control chart – 1-revolution motor with frequency inverter
- 7) Declaration for safe use of the machine

In Příbram, December 2016

Written by: Jiri Labuda

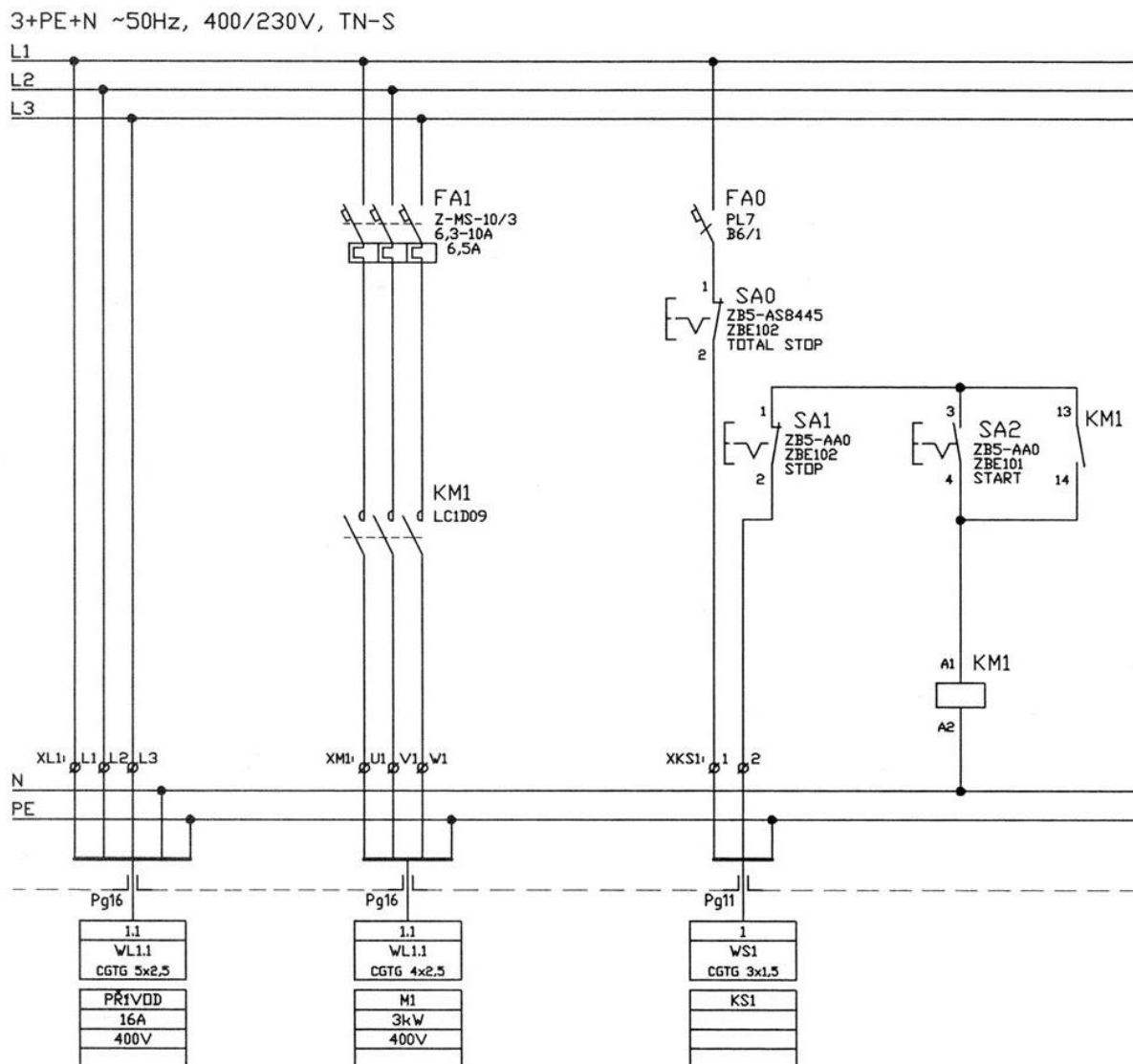
Company: FILAMOS, s.r.o., Hate 546, 261 01 Příbram, Czech Republic

Appendix 1: Table of main dimensions

Model	Length	Width	Height
	[mm]	[mm]	[mm]
M 50	730	680	950 – 1230
M 80	820	650	1090-1370
M 125	900	795	1090-1370
M 180	970	875	1090-1370
M 250	1140	1040	1270
M 250 H	1300	1110	1300
M 400 H	1400	1150	1460
M 550 H	1750	1610	1350

Note: These figures apply to standard construction models. Different figures may apply to models with a modified design.

Appendix 2: Electric control chart (1-revolution motor)

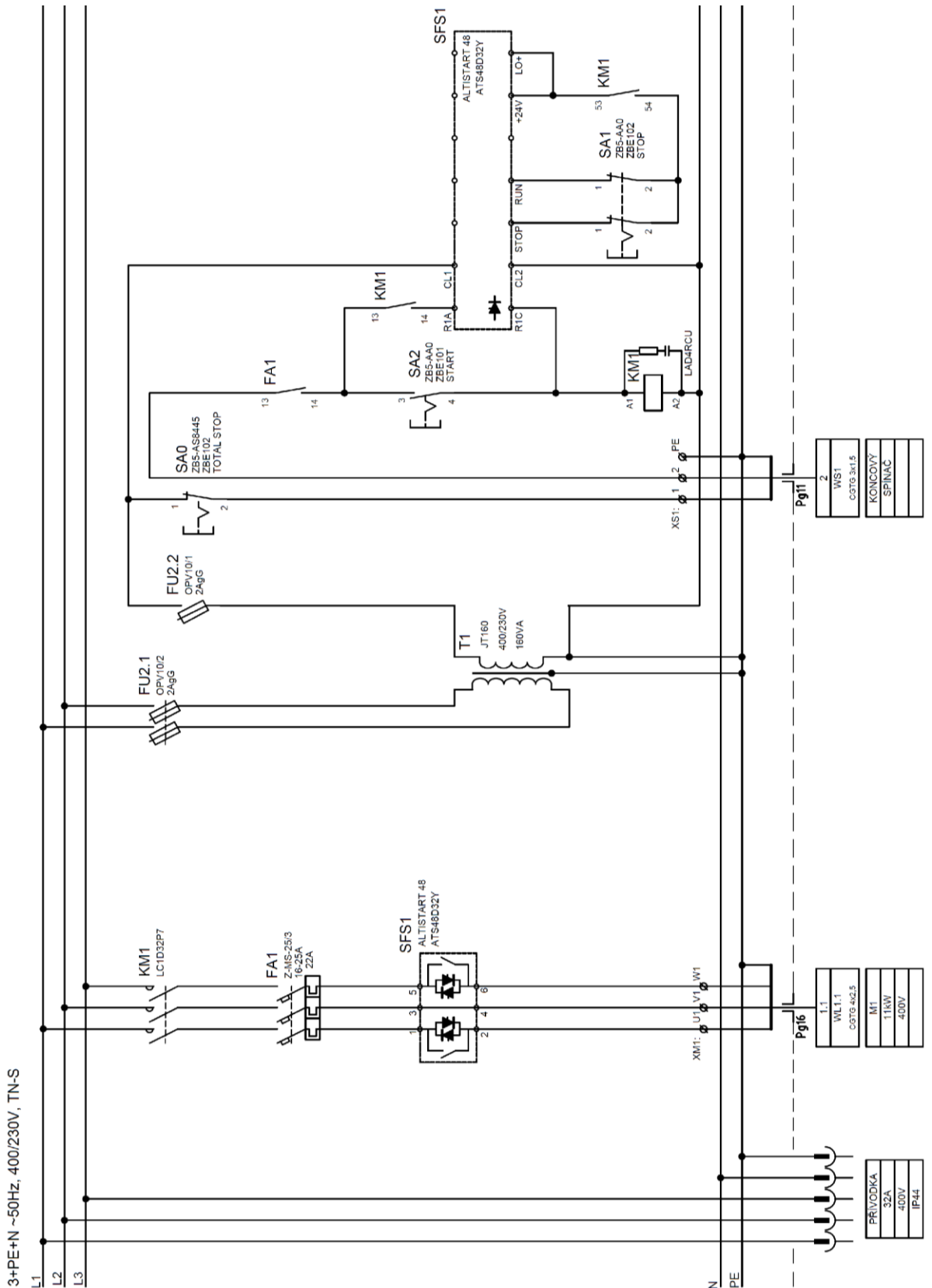


System 3+PE+N 400/230V, 50Hz TN-S

PROTECTION AGAINST DANGEROUS CONTACT IS SECURED BY DISCONNECTION FROM SOURCE

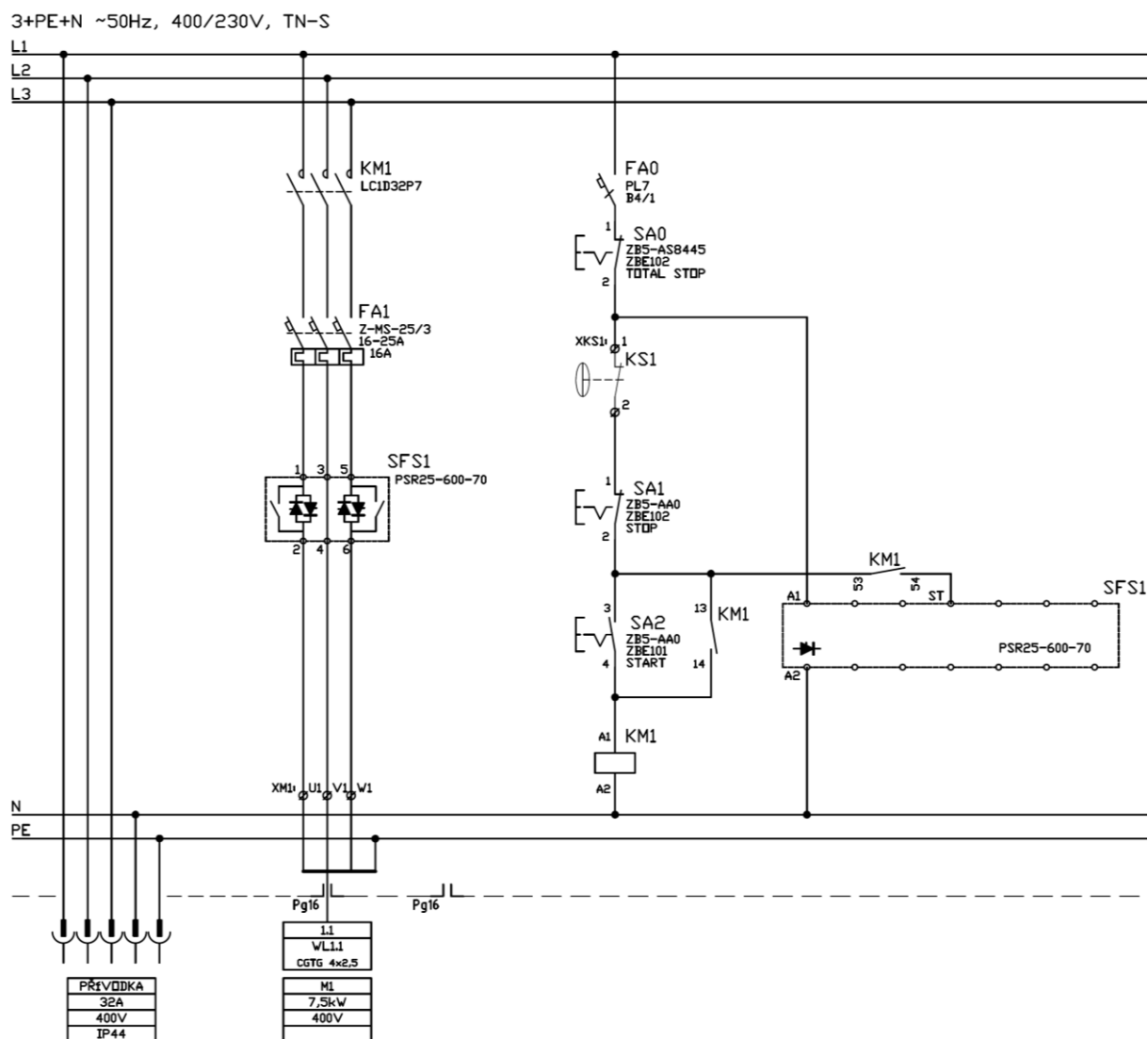
- | | |
|---------|---|
| -PŘÍVOD | wall supply unit IP 67 |
| -M1 | asynchronous motor |
| -FA1 | engine switch |
| -KM1 | contactor |
| -KS1 | position switch |
| -FA0 | circuit breaker for the position switch |
| -SA0 | total stop button |
| -SA1 | stop button |
| -SA2 | start button |

Appendix 3: Electric control chart – 1-revolution motor with softstarter Schneider brand



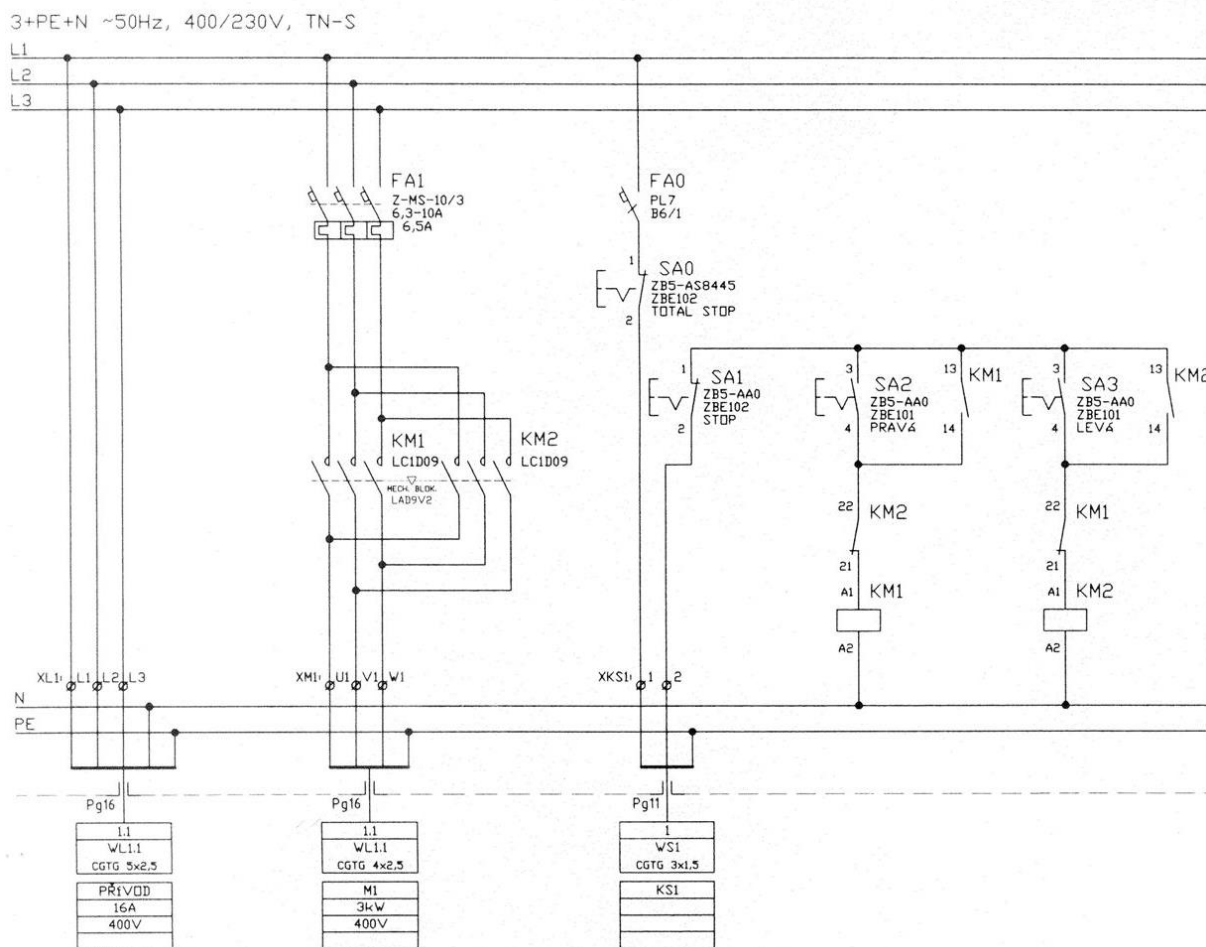
-PŘÍVODKA	wall connector, IP 67
-M1	asynchronous motor
-SFS1	softstarter Schneider
-FA1	fuses
-KM1	contactor
-KS1	position switch
-FA0	circuit breaker for the position switch
-SA0	total stop button
-SA1	stop button
-SA2	start button

Appendix 4: Electric control chart – 1-revolution motor with softstarter ABB brand



- PŘÍVODKA wall connector, IP 67
- M1 asynchronous motor
- SFS1 softstarter ABB
- FA1 motor switch
- KM1 contactor
- KS1 position switch
- FA0 circuit breaker for the position switch
- SA0 total stop button
- SA1 stop button
- SA2 start button

Appendix 5: Electrical control diagram (1-revolution engine L/R running)



-PŘÍVOD

-M1

-FA1

-KM1

-KM2

-KS1

-FA0

-SA0

-SA1

-SA2

-SA3

wall supply unit IP 67

asynchronous motor

engine switch

contactor

contactor

position switch

circuit breaker for the position switch

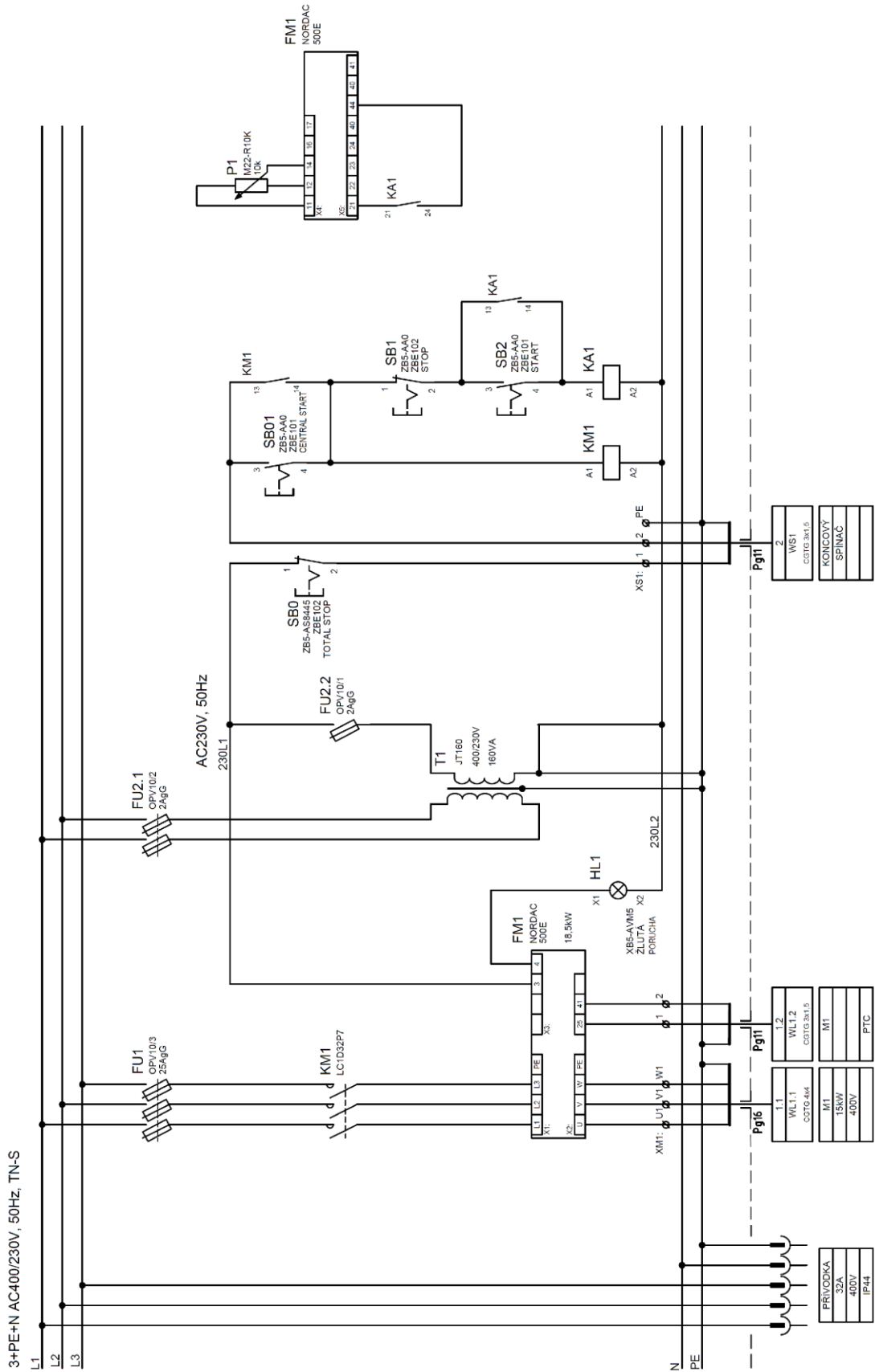
total stop button

stop button

start Right button

start Left button

Appendix 6: Electric control chart – 1-revolution motor with frequency inverter



-PŘÍVODKA	wall connector, IP 67
-M1	asynchronous motor
-FM1	frequency inverter
-FU1	fuses
-KM1	contactor
-KS1	position switch
-FA0	circuit breaker for the position switch
-SB0	total stop button
-SB01	central start button
-SB1	stop button
-SB2	start button

Appendix 7: Declaration for safe use of the machine

Each operator and user of an M series machine with forced running must carefully read and familiarize themselves with the user manual and the safety risks regarding the operation of this machine.

Only people who fulfil all the conditions of the under mentioned declaration are entitled to operate and use the machine. The fulfilment of the under mentioned declaration is confirmed by the authorized employee by his/her signature.

I hereby declare that:

- I have carefully read the whole user manual,
- I am fully familiarized with all instructions for the use of mixer M series,
- I will use the machine safely in accordance with all the instructions contained in the user manual

List of people authorized to work with the machine:

Name	Surname:	Date	Signature