



200-400U and 500-600U

Manual for

Relay Control Unit

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Introduction

Dear Customer,

We congratulate you on the purchase of the dryer manufactured by *Mepu Oy*.

Already during the past 25 years our dryers have proved to be effective and reliable machines in operation. To ensure your safe working conditions and a cost-saving use of the dryer it is necessary that you are familiar with its technical facilities and operation. Therefore, please read these operation instructions carefully before placing the dryer in service.

Good know-how, correct regulations, scheduled maintenance and regular cleaning ensure both your personal safety and the reliability of the dryer under varying working conditions.

Nevertheless, during the season it is always possible that there might appear a malfunction, or there might be a sudden requirement for some spare parts, or some other unexpected failure can appear. These problems might need extra help. Contact first your local dealer who can give you the best possible help during harvest season. Local dealer also provides good after sales service effectively and quickly in customer own language. Do not hesitate to contact their service.

Dealer's unresolved problems, contacts our service:

Tel. international +358-(0)2-2754444 / Service

Fax international +358-(0)2-2563361

service@mepu.com

Warranty and conditions

You are a very important person to us. We very much like to know – even after the warranty period of one year – if you are satisfied with your dryer and with our service. Your opinion will be treated confidentially by us, and is taken into consideration when developing our machines and service.

Therefore, would you kindly return the certificate of guarantee back to us upon receipt of the dryer.

- The period of warranty for the dryer in agricultural production is one (1) year. The period of warranty for the heat exchanger and the burner chamber of the furnace are exceptionally three (3) years, (excluding the burner, one (1) year guarantee). The warranty period becomes valid by the delivery date.
- The warranty applies to the faults due to the manufacture and the used materials. Defect components will be repaired or changed to new ones. In the event that it is found out that the fault is not within the scope of the warranty, the actual costs will be charged to the customer.
- Repair under warranty does not exceed the period of warranty.
- **The warranty does not cover the following things:** indirect loss or damage, financial deficit therefrom, loss of profit, freight costs, travel expenses, machine downtime, modifications of the original structure, or any other financial loss.
- **The warranty does not cover premature wear or damage of the components due to non-compliance with maintenance procedures.**



Before each repair it is necessary to agree with the manufacturer on the things belonging to the scope of the warranty and on possible costs.

1. Important for users



Risk of falling down

After the grain bin installation, mount the ladders, the safety cages and the handrails at the top. Pay special attention to your safe working conditions when you are on the roof, a wet or frozen roof provides a hazardous risk.



Switch off the power supply in the following situations:

- By opening the cover plates for maintenance and adjustments
- By cleaning the lower part of the elevator or the auger ducts
- By tightening the elevator chain or tensioning the conveyor V-belts
- By entering the grain bin for adjusting the spreader
- By opening the oil burner for maintenance



Fire hazard. Clean the dryer and its environment

- The discharge pipes from the pre-cleaner and from the bottom aspirator must be conducted far enough away from the dryer. Preferably, the pipes can be collected together and arrange them to conduct through a cyclone to a waste container. The supply air needed for the furnace must absolutely be clean.
- The air coming out through the air extraction cases contains humidity and dust. Therefore, this air must be led far enough away from the dryer to avoid the mixture with the supply air to the furnace.
- In the event that the outgoing air will be mixed up with the incoming air, the drying efficiency is considerably decreased.
- Every 100 hour it is necessary to control the inner bottom of the furnace, and in this connection the air extraction cases as well. They all must be clean. Furthermore, at the end of each drying process you should open the emptying lever located at the rear of the dryer between the feeder and the elevator.



Risk of leaking oil

After having adjusted the oil burner pressure, the shut-off valve of the pressure gauge must be closed. If you leave the valve open, the pressure gauge may be damaged and the oil can leak out. The oil ducts between the oil tank and the oil burner must be protected against damages in the way that this precaution does not hinder you to move freely around the dryer.



Adequate lighting

The drying process is seasonal, evenings and nights in late summer months are getting dark. Pay attention to your safe working conditions and arrange an extra lighting, if needed.



Filling and emptying the dryer

By filling and emptying the dryer, make sure that there is no risk for unauthorized persons from the moving tractor-trailer combination, or danger of injury due to crushing between the trailer and the filling hopper.



Fire extinguisher

During the period of operation there must always be a fire extinguisher available close by the dryer we recommend; 12 kg. Make clear the fire safety requirements for own country and follow them. Manufacturer is not responsible if neglected local government regulations.



Operation instructions

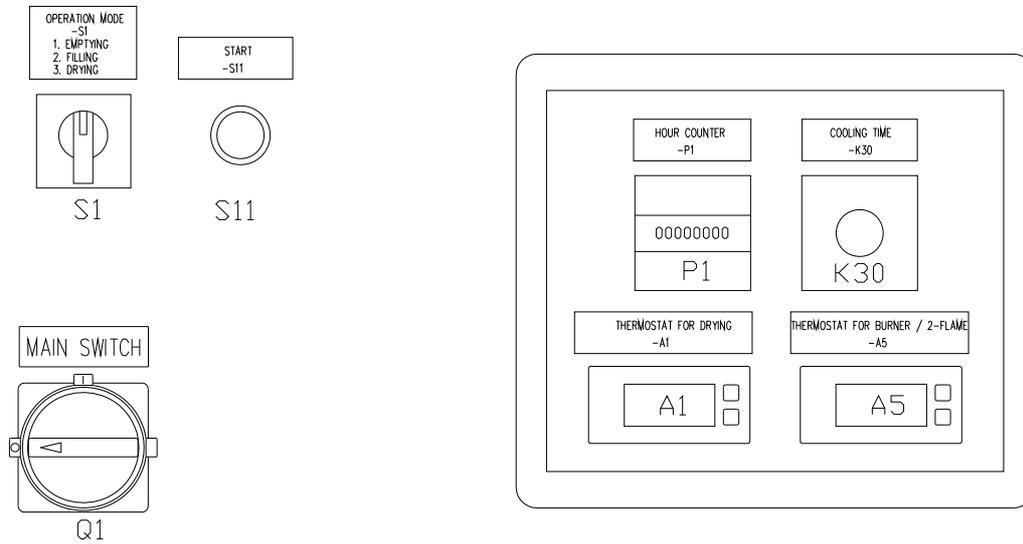
Read carefully the instructions given in this manual before start to install and use your dryer.

2. Electrical cabinets

2.1. 200-400U electrical cabinet

2.1.1. Cover of the electrical cabinet

DRYING -H1	COOLING -H7	DRYER FULL -H8	ELEVATOR FAULT -H9	OILBURNER FAULT -H10	FREQUENCY CONVERTER FAULT -H11	MOTOR CIRCUITBREAKER FAULT -H12
H1	H7	H8	H9	H10	H11	H12

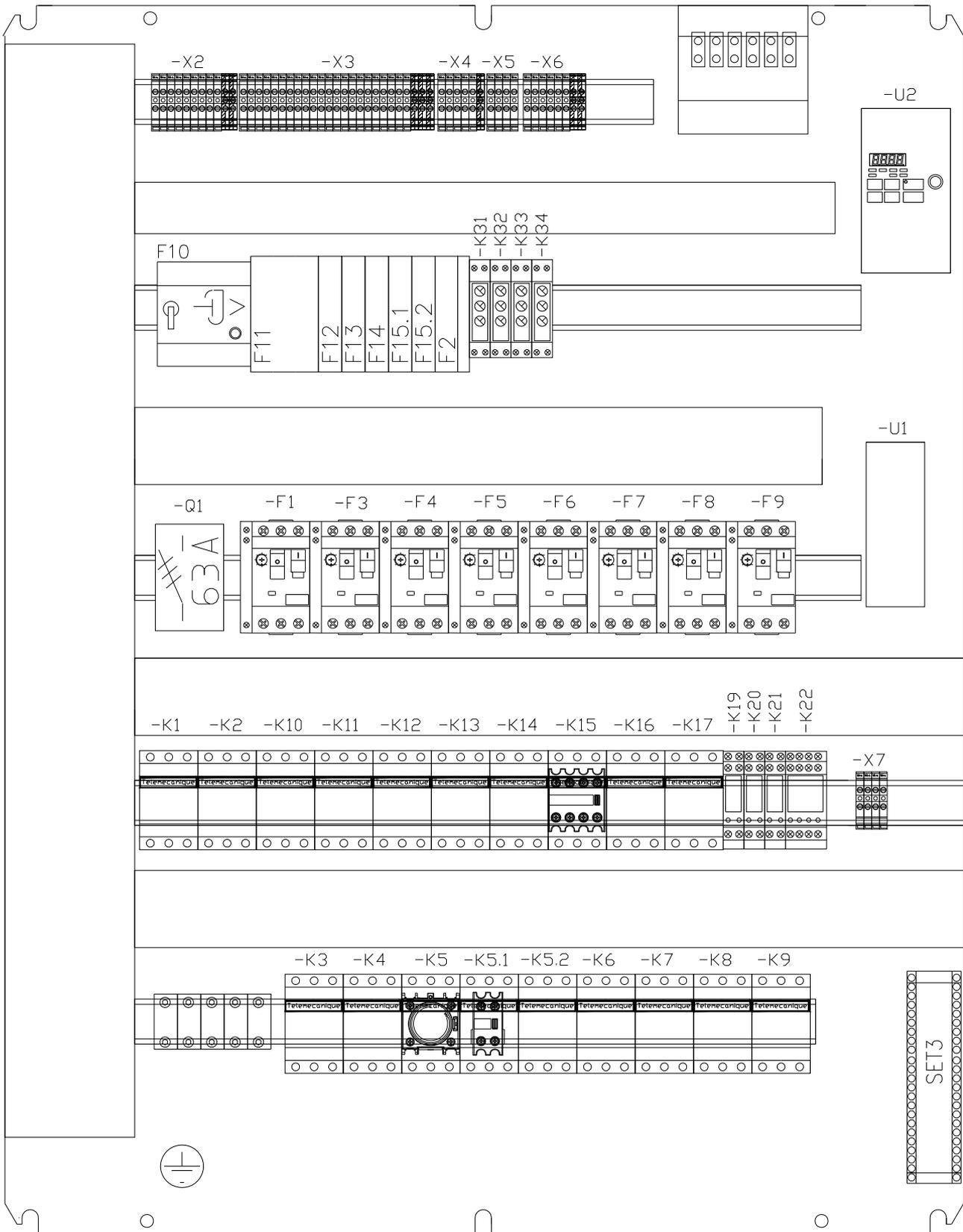


AUTO OPERATION -S2 / -H2	MANUAL ELEVATOR -S3 / -H3	0 1 PRE-CLEANER -S4 / -H4	0 1 FEEDER UNIT -S5 / -H5	0 1 BOTTOM FAN -S6 / -H6	0 1 CHANNEL FANS -S7 / -H13	- + FEEDERUNIT SPEED -R1	1 0 2 DIVIDER -S20
S2/H2	S3/H3	S4/H4	S5/H5	S6/H6	S7/H13	R1	S12
							OPT10

2.1.2. Description and functions

Unit	Description	Function
H1	Drying	Illuminating during drying
H7	Cooling	Illuminating during cooling
H8	Dryer full	Illuminating when the dryer is full filled
H9	Elevator rotation fault	Illuminating when the elevator rotation detector is covered (tripped)
H10	Burner fault	Illuminating when the burner fault signal is illuminating in the burner
H11	Frequency converter fault	Illuminating when there is a frequency converter fault in the feeder unit motor
H12	Motor circuit breaker fault	Illuminating when the motor circuit breaker tripped
S1	Selector switch for the operation mode	Operation mode selection. 1 = emptying, 2 = filling, 3 = drying
S11	START of the drying process	After having carried out all the adjustments, turn the selector switch to the position 3 and press the START pushbutton.
Q1	MAIN SWITCH	Main switch of the electrical cabinet
P1	Hours in operation	Indicating how many hours the main air fan has been in operation
K30	Cooling timer	For setting of the cooling duration
A1	Drying thermostat	Setting of the drying temperature limit value, i.e. the change-over from drying to cooling.
A5	Burner 2-stage thermostat	Setting of the shutdown temperature of the 2-stage burner
S2/H2	AUTO / MANUAL Selector switch for the automatic / manual mode of operation	Selector switch for the automatic or manual mode of operation. When the signal light is illuminating, the MANUAL mode of operation is turned on.
S3/H3	Manual operation mode of the elevator	Selector switch for the manual operation mode of the elevator
S4/H4	Manual operation mode of the pre-cleaner	Selector switch for the manual operation mode of the pre-cleaner
S5/H5	Manual operation mode of the feeder	Selector switch for the manual operation mode of the feeder
S6/H6	Manual operation mode of the bottom aspirator	Selector switch for the manual operation mode of the bottom aspirator
S7/H13	Selector switch for the conduit fans	For selecting if the conduit fans are on or off during drying. 1 = turned ON during drying; 2 = turned OFF during drying.
R1	Regulation of the feeder speed	Adjustment of the feeder speed: 0 = the slowest speed, 10 = the fastest speed
S12	Selector switch for the manual operation of the electrical three-way distributor (option)	Selector switch for the electrical three-way distributor: 1 = the direction 1; 0 = the direction in the middle; 2 = the direction 2

2.1.3. Inside drawing

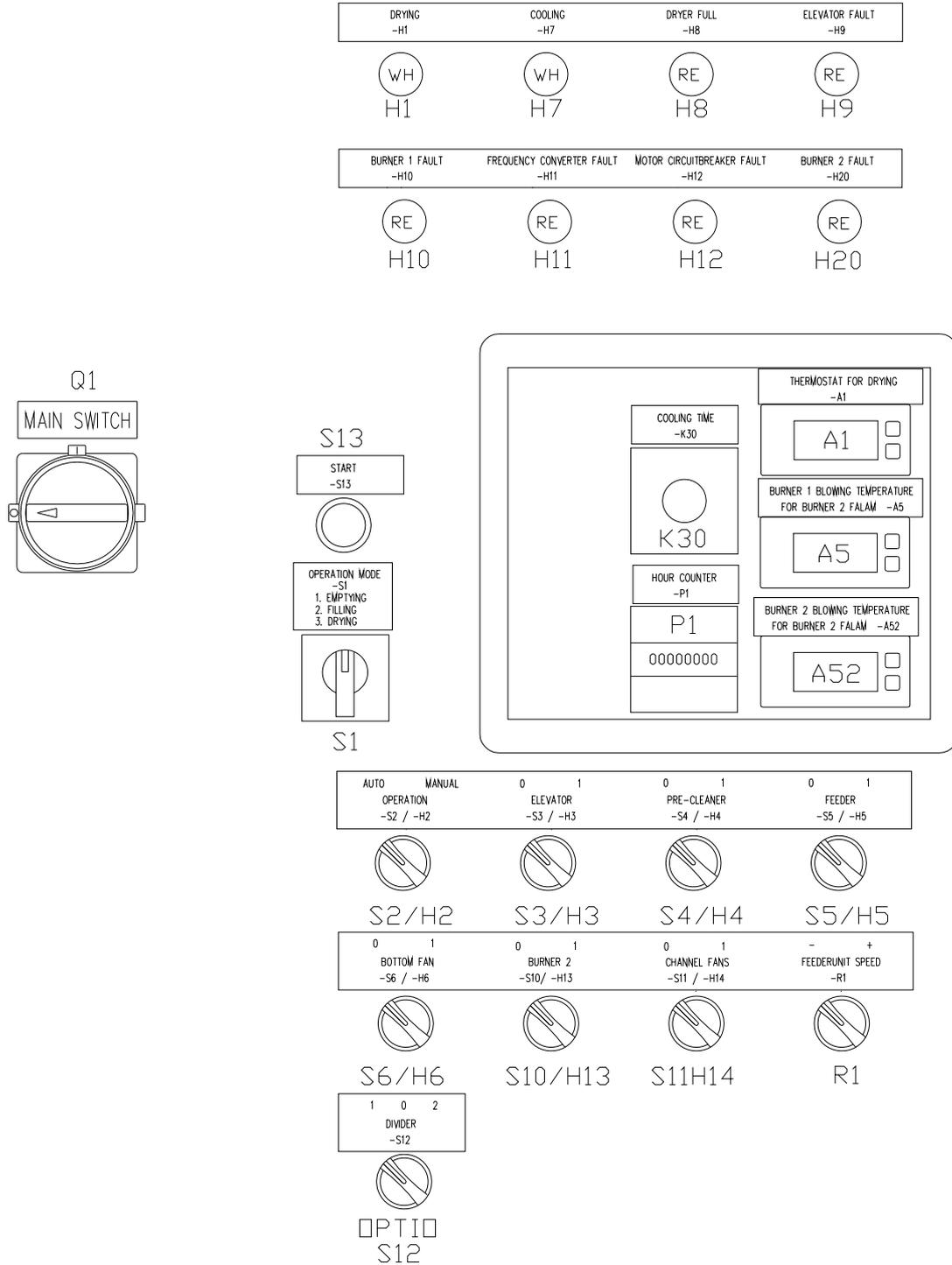


2.1.4. Description

Unit	Description
X1,2,3,4,5,6,7	Terminal blocks
T1	Control current transformer
U2	Frequency converter of the feeder unit
F10	RCCB (residual current-operated circuit breaker)
F15.1 F15.2	Fuses of the control current transformer
F11-F14	Main fuses
F2	Fuse of the frequency converter
K31	Time relay of the rotation control
K32	Time relay of the filling level sensor
K33	Delay time by starting the drying
K34	Delay time by starting the conduit fan 2
Q1	MAIN SWITCH
F1, F3-F9	Releases of motor protective switches
U1	Soft start of the elevator
K1 – K17	Motor control contactors
K19 – K22	Motor control contactors

2.2. 500-600U electrical cabinet

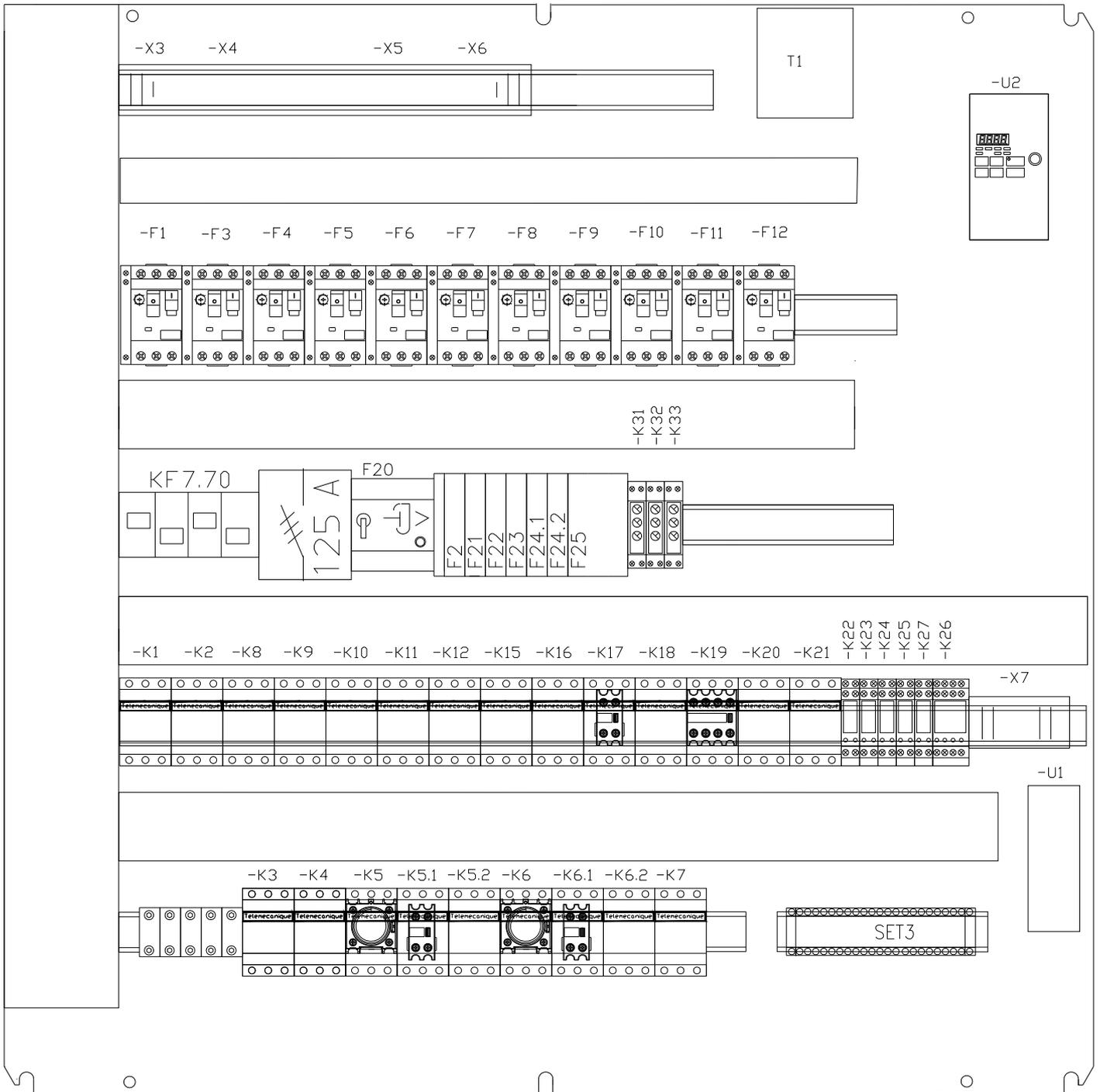
2.2.1. Cover of the electrical cabinet



2.2.2. Description and functions

Unit	Description	Function
H1	Drying	Illuminating during drying
H7	Cooling	Illuminating during cooling
H8	Dryer full filled	Illuminating when the dryer is full filled
H9	Elevator rotation fault	Illuminating when the elevator rotation detector is covered (tripped)
H10	Burner fault	Illuminating when the burner fault signal is illuminating in the burner
H11	Frequency converter fault	Illuminating when there is a frequency converter fault in the feeder unit motor
H12	Motor circuit breaker tripped	Illuminating when the motor circuit breaker tripped
H20	2 – furnace burner fault	Illuminating when the 2 – furnace burner fault signal is illuminating in the burner
S1	Selector switch for the mode of operation	Operation mode selection. 1 = emptying; 2 = filling; 3 = drying
S13	START of the drying process	After having carried out all the adjustments, turn the selector switch to the position 3 and press the START pushbutton.
Q1	MAIN SWITCH	Main switch of the electrical cabinet
P1	Hours in operation	Indicating how many hours the main air fan has been in operation
K30	Cooling timer	For setting of the cooling duration
A1	Drying thermostat	Setting of the drying temperature limit value, i.e. the change-over from drying to cooling.
A5	Burner 2-stage thermostat	Setting of the shutdown temperature of the burner 2-stage
A52	Burner 2-stage thermostat in the 2 - furnace	Setting of the shutdown temperature of the burner 2-stage in the 2 - furnace
S2/H2	AUTO / MANUAL Selector switch for the automatic / manual operation mode	Selector switch for the automatic or manual mode of operation. When the signal light is illuminating, the MANUAL mode of operation is turned on.
S3/H3	Manual operation mode of the elevator	Selector switch for the manual operation mode of the elevator
S4/H4	Manual operation mode of the pre-cleaner	Selector switch for the manual operation mode of the pre-cleaner
S5/H5	Manual operation mode of the feeder	Selector switch for the manual operation mode of the feeder
S6/H6	Manual operation mode of the bottom aspirator	Selector switch for the manual operation mode of the bottom aspirator
S10/H13	Selector switch of the 2 - furnace	Will be selected, if the 2 – furnace is in use
S11/H14	Selector switch for the conduit fans	For selecting if the conduit fans are on or off during drying. 1 = turned ON during drying; 2 = turned OFF during drying.
R1	Regulation of the feeder speed	Adjustment of the feeder speed: 0 = the slowest speed, 10 = the fastest speed
S12	Selector switch for the manual operation of the electrical three-way distributor (option)	Selector switch for the electrical three-way distributor: 1 = the direction 1; 0 = the direction in the middle; 2 = the direction 2

2.2.3. Inside drawing



2.2.4. Description

Unit	Description
X1,2,3,4,5,6,7	Terminal blocks
T1	Control current transformer
U2	Frequency converter of the feeder unit
F20	RCCB (residual current-operated circuit breaker)
F24.1 F25.2	Fuses of the control current transformer
F21-F23	Main fuses
F25	Fuse of the frequency converter
K31	Time relay of the rotation control
K32	Time relay of the filling level sensor
K33	Delay time by starting the drying
K34	Delay time by starting the conduit fan 3 and 4
Q1	MAIN SWITCH
F1, F3-F12	Releases of motor protective switches
U1	Soft start of the elevator
K1 – K17	Motor control contactors
K19 – K22	Motor control contactors

3. Installation and putting in operation

3.1. Electricity

Only an authorized electrician may perform the electrical installation of the machinery. The electrical diagrams are delivered together with the machinery; these documents are attached inside the electrical cabinet.



Mounting accessories and cables for the electrical installation are not delivered with the dryer.

3.1.1. Installation place

The electrical cabinet must be installed to such a place that it is nearly impossible to damage it in the normal course of use. Likewise, the electrical cabinet must be installed to such a place where its exposure to water, dirt and dust is limited to the minimum (not e.g. above the filling container). There must be enough space in the front of the electrical cabinet for opening the cover/s. Keeping in mind that the electrical cabinet is used throughout the year, it would be good if it is installed in a dry and warm room.



It is not allowed to install any electrical components to the electrical cabinet of the dryer which belong to the electrical installation of the premises itself. These electrical components must be installed to a separate electrical center.

3.1.2. Electrical installation

The connected power required for the machinery is mentioned in the electrical diagrams. Based on this, the electrician can choose the right feeder cable. The motor sizes mentioned in the electrical diagrams are the maximum values of the appropriate motor outputs. By dimensioning the motor cables, the motor size must be checked from the delivery. These kinds of motors are the motors of the elevators and the fans, the motors in the conveyor system and the motor of the pre-cleaner. An underdimensioned cable may heat, and in this way may cause a hazard or malfunctions. Observe also the different motor connections and shielded cables required for various frequency converters. The electrical diagrams are available inside the electrical cabinet. The sensors for detecting the temperature and other sensors are delivered together with the electrical cabinet.

3.1.3. Putting in operation

Before taking into use, control the motor circuit breakers in the electrical cabinet, and control the rotation directions of the motors. The correct function of each individual device must always be controlled. There is an arrow marked in the fan; this arrow shows the rotation direction of the fan.



Before controlling the rotation direction of the elevator, the back stop of the elevator must be disconnected.

The rotation direction of the burner fan must always be controlled.

4. Units and sensors

4.1. Motors

All dryer motors are 3-phase squirrel-cage motors. The main voltage of the motor input is 400 V (except in the feeder motor). The connection must always be checked from the motor rating plate in order to avoid false connections.

If the customer has ordered special units, e.g. frequency controlled devices, must the connection of these devices be controlled according to the supply voltage of the frequency converter.

4.2. Feeder

The feeder is frequency controlled. The frequency converter is situated in the cabinet; control by a potentiometer (R1) from the cabinet cover/s. By connecting the feeder, the electrician must take into consideration that the supply voltage of the frequency converter is 230V. By connecting the motor, the electrician must check from the motor rating plate how the connection must be performed when using 230V.

4.3. Elevator motor

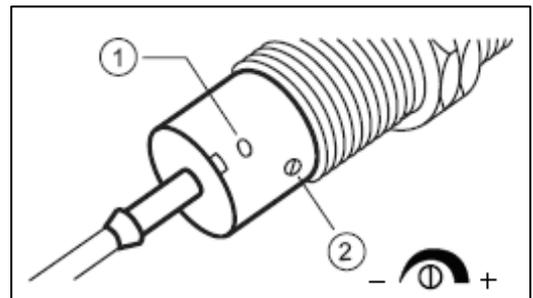
Big elevator motors are equipped with soft starters. This makes no exception to the general connection instructions; the motor of the elevator is connected regarding the voltage of 400V.

When checking the rotation direction of the elevator, remember to disconnect the elevator back stop. After checking, do not forget to connect again the back stop.

4.4. Rotation control of the elevator

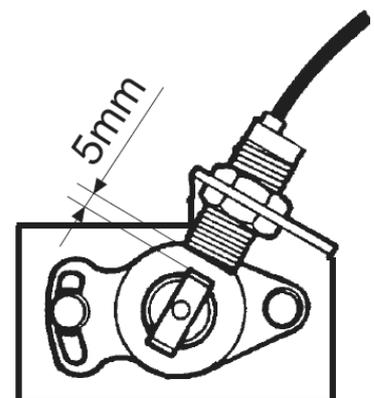
In the elevators manufactured by *Skandia* the rotation control is ready-installed at the lower part of the elevator. The rotation control is pre-set at the factory. If you find out that there is no pre-setting, or if you must change the rotation control, proceed as follows.

If the green LED (1) is illuminating: Turn the set screw (2) to a lower value (-) as long as the LED is no more illuminating. After done this, turn the set screw half a turn to a higher value (+).



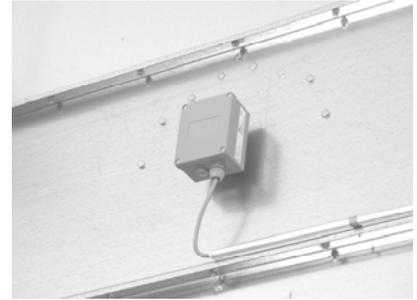
If the green LED (1) is not illuminating: Turn the set screw (2) to a higher value (+) as long as the LED is illuminating. After done this, turn the set screw half a turn to a higher value (+). Observe that the adjustment range is very small, i.e. only approx. 2,5 turns, and there is no any left or right end point in the set screw. By turning the set screw too much, the adjustment range might be exceeded, and therefore, the adjustment is cleared.

By switching on the elevator, the detector is always activated during 5-10 seconds, apart from the fact that the detector has a correct adjustment or not. If the detector is not functioning correctly, despite the above mentioned adjustment, check that the distance between the detector and the notch is as shown in the drawing.



4.5. Filling level sensor

The filling level sensor is installed to the second highest layer of the grain bin. While installing the filling level sensor, its correct position must be observed: the exit of the wire from the bottom side. Remember to install the guard brush above the filling level sensor to the grain bin.

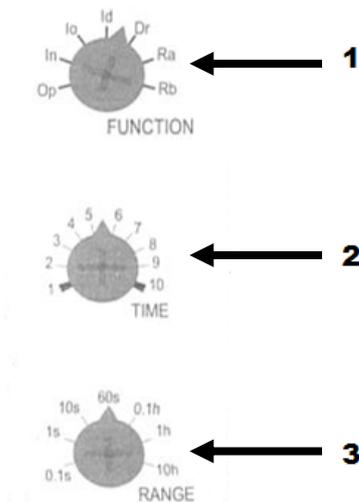


4.5.1. Delay time of the filling level sensor (K32)

The time delay of the filling level sensor can be adjusted in the electrical cabinet. There are three setting ranges in the timer. The selection for the timer operation (1) is in the upper position. This is pre-set at the factory and should never be adjusted at site. The delay time adjustment (2) is in the middle. The time range selection (3) is in the lower position.

Adjust the time range selection only if the required filling level cannot be achieved, in which case the time range must be enlarged. By turning the middle selector switch (2), the time is adjusted within the time range selection. If there is the time range 10s, this means that 1 equals 1s and 10 equals 10s in the middle selector switch. If there is the time range 60s, this means that 1 equals 6s and 10 equals 60s in the lower selector switch.

The filling level must be controlled after each adjustment. Make only very small adjustments at one time, in this way eliminating possible blockages. Observe that different grain types differ from each other as to their filling time.



4.6. Furnace

4.6.1. Installation of the burner

The connections of the burner are given in the electrical diagrams. Check always the type of the delivered burner, because the type determines the connection.

The manufacturer has marked the maintenance switch (-S8) in the electrical diagrams. By turning this maintenance switch, the power of the burner can be turned off for maintenance. If you do not use the maintenance switch, the electrician must switch the connection connectors through.



Observe that the burner must be equipped with a disconnecter functioning as an all-pole disconnecter, for disconnecting the burner from the low voltage net.

The maintenance switch does not substitute the low voltage circuit breaker.

4.6.2. Use of the burner

The manufacturer has tested the burner at the factory. Therefore, the burner is ready for use after the connection to the power network and to the oil supply system. On the side or on the front side (depending on the type) there is a burner switch. By turning this switch you can choose the flame, or shut down the whole burner. By turning this switch to the position 2, both the flames are used. By turning this switch to the position 1, only one flame is used. By turning to the position 0, the burner is switched off.



If a malfunction occurs, the control relay is blocked to the malfunction position. A red signal light is illuminating in the burner relay and in the electrical cabinet. When you press the red signal light, you can restart the burner. The malfunction can be reset in approx. 20 seconds after the illumination of the signal light.



Instructions and other documents for the burner are available in the black plastic case, delivered together with the furnace.



Before installing the furnace, take notice of the instructions given by your local fire department.

Before taking in use, read the instructions given in the burner manual. Only an authorized burner fitter may perform the burner maintenance.

4.6.3. Thermostat enclosure

There is a thermostat enclosure on the sidewall of the furnace. In this thermostat enclosure there are an overheat control thermostat and a fan thermostat and a burner thermostat. The probes, i.e. the capillaries of the thermostats, are standard uncoupled with their holders, and therefore, they must be installed into the holders at site. Mount the cover tube of the capillaries inside the sleeve, and lock with a lock screw to the cover tube. Remember to tighten the lock screw in the holder. It is not allowed to bend the capillaries to form sharp angles. You cannot cut or prolong the capillaries. By starting off with the drying process, control always the correct function of the thermostats.



The wiring to the burner and to the electrical cabinet must be installed by an electrician. Further information for the electrical installation of the thermostat enclosure is available in the burner manual and in the electrical diagrams of the electrical cabinet. The electrical installation of the burner thermostat can be performed directly from the thermostat enclosure to the burner.



4.6.4. Set values of the thermostats

Thermostat values are counted beginning with the zero point. The zero points of the overheat control thermostat and the burner thermostat are situated horizontally on the left hand side by viewing directly to the thermostat knob. The fan thermostat is read vertically from above.

Thermostat	Type	Set value °C
Fan thermostat	Capillary	50
Burner thermostat	Capillary	90
Burner thermostat 2-stage	Digital	80
Overheat control thermostat	Capillary	120

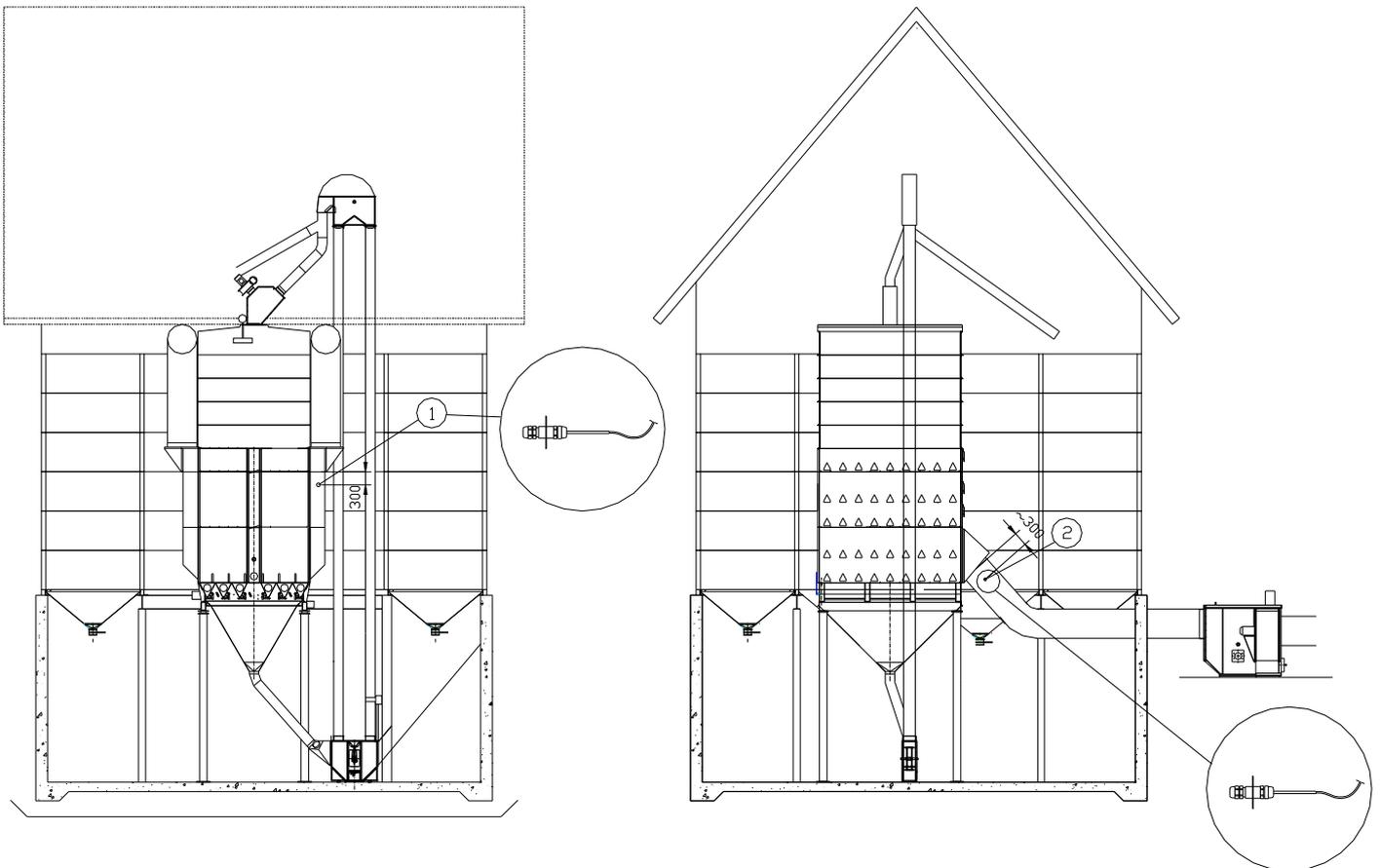
4.7. Temperature sensors

Temperature sensors for detecting drying air and extracted air temperatures are delivered with the electrical cabinet. There are also their mounting plates.

Install the sensor to the holder in the way that the plastic cone (probe) is protruding out of the holder, as seen in the picture.

In the dryers equipped with one furnace, two sensors are included in the delivery. In the dryers equipped with two furnaces, three sensors are included in the delivery.

Install the sensors as shown in the drawings here under. The sensor which detects the extracted air temperature (2) is installed to the air outlet conduit, approx. 300 mm before the joint to the dryer. The sensor which detects the drying air temperature (1) is installed to the side air case in the way that the distance from the air outlet joint is approx. 300 mm.



5. Operation of the Dryer

Start the drying process by turning the main switch to the position 1. After the drying process, the power of the dryer is shut down by turning the main switch to the position 0.



In the automatic operation mode (the manual/automatic selector switch is in the automatic mode) all the manual switches must be in the position 0 (S3-S6).

5.1. Filling process

Read first the instructions given in the manual of the dryer, and take care of all the preliminary operations described in this manual. After preliminary work you can start off with the filling process by turning the selector switch to the position 2 –filling.

The spreader, the pre-cleaner and the elevator are started simultaneously. These units are in operation until the operator stops the filling process by turning the selector switch to the position 0. Or the filling process is interrupted by the filling level sensor. The filling level sensor detects the grain, and after the set time delay interrupts the filling. The setting of the delay time of the filling level sensor is described in the chapter 4.5 Filling level sensor.

If you change the trailer during the filling, it is recommended that the filling process would not be stopped for a short period (approx. for 15 min). If the change-over takes more time, you must let the conveyors and the elevators run empty before the next start. In this way you can eliminate the risk of blockages.

5.2. Drying process

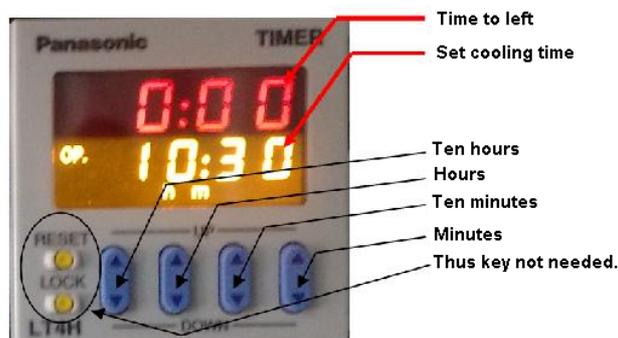
After the preliminary operations, and when there is grain in the dryer, you can start off with the drying process.

For the first time, and prior to the season, it is necessary to control as follows:

- The main selector switch and/or the maintenance switch are switched on
- The oil is supplied
- The thermostats of the furnace have correct settings
- The 2-stage thermostat of the burner have a correct setting
- The drying thermostat has a correct setting

After preliminary work you can start the drying process.

First, adjust a proper cooling duration (K30). The cooling time depends on the dryer model and the filling speed. The main principle is that the whole batch circulates once through the dryer. After this setting, the drying thermostat must be adjusted. When putting in operation for the first time, it is advisable that the value of the drying thermostat is adjusted high enough, e.g. to be 50°C. If you have already calibrated the drying thermostat, you can program the proper temperature directly to the drying thermostat.



After done these settings, turn the selector switch to the position **3 -drying**, and press the START pushbutton (200-300U S11) (500-600U S13). The drying process is started by switching on the main fan. By achieving the full rotation of the main fan, the rest of the units are started: the elevator, the feeder, the pre-cleaner, the bottom aspirator (depends on the model), the spreader and the potential conduit fan/s. The other conduit fan begins to rotate after these units, but with a delay time.

When all units have been started, the burner starts after some delay. This delay time depends on the type of the burner, and lasts approx. 10 – 20 seconds. When the burner is in operation, the drying process proceeds and the signal light of the drying is illuminating (H1).

When the temperature in the drying thermostat exceeds the desired temperature, the cooling phase starts, and the signal light of the cooling is illuminating (H7).

5.2.1. The grain is not dry enough

If the grain is not dry enough, you can choose once again the drying by increasing the value of the drying thermostat over the set value, and by switching the program selector switch firstly to the position 0, and after this back to the position **3 -drying**. You must also press the start pushbutton of the drying. Remember to adjust a new cooling time.



Control the humidity content of each batch using a humidity meter.

5.3. Emptying after the drying process



Before emptying the grain, check that the grain flows without blockages.

After cooling the grain, you must take care of the preliminary operations for emptying the dryer. Start the emptying process by turning the selector switch to the position **2 -emptying**.

The elevator and the feeder are in operation, and you can proceed by opening the bottom outlets. Open slowly the bottom outlets one by one, thus maintaining a constant grain flow to the elevator. If you have a conveyor after the elevator, the outlets of the feeder can be left closed, and after having adjusted the duration, you can control the feed rate.

The emptying process is shut down by turning the selector switch to the position 0. Observe that it takes some time before the elevator and the conveyors are empty.

5.4. Function of the furnace

If the drying air temperature exceeds the limit value (approx. +90°C) set in the burner thermostat, the burner shuts down. The burner is reactivated when the temperature has fallen by 2 – 4°C. The pilot light of the two-stage burner is controlled directly from the two-stage thermostat from the electrical cabinet. The set value must be 4 – 8°C lower than that of the set value of the burner thermostat. In this way it is ensured that the burner does not interrupt the burning by the single output, but is justified by the double output.

The set value of the overheat control thermostat is approx. 120°C, and is slightly higher than the set value of the burner thermostat, thus ensuring that the furnace temperature is not rising too high. When the overheat control thermostat is activated, it stops the whole unit, but leaves the main air fan on. The unit is activated automatically, when the temperature has fallen below the set value of the fan thermostat (approx. + 50°C).

By shutting down the drying, or when the furnace for some reason remains still warm (e.g. during a trial run), the fan thermostat keeps the fan on until the furnace temperature has fallen below + 50°C. Let the furnace cool down before starting the next process.

5.4.1. Adjustment of the furnace

The following two facts have a significant influence on how cost-saving the drying process is: firstly, the furnace must be clean, and secondly, the burning process shall not develop any soot. Therefore, read carefully the installation instructions for the burner before taking the furnace in use. The burner adjustment must always be controlled by an authorized burner fitter. For further information, please visit <http://www.oilon.com>, where you find the *Oilon* international service companies.

5.5. Alarms

5.5.1. Elevator rotation fault (H9)

The alarm light of the elevator rotation fault is illuminating, if the elevator rotation speed is significantly slowing down. The whole dryer is stopped by this malfunction. There can be several reasons for this malfunction. Try to solve the problem, and when the elevator rotates without disturbance, reset the fault by turning the main switch to the position 0, and after this, restart by turning the main switch to the position 1. You can find some reasons for this malfunction in the troubleshooting.



Before detaching the elevator covers, turn the main switch to the position 0.

5.5.2. Burner fault (H10/H20)

The alarm light of the burner is illuminating, if there is some malfunction in the burner. This malfunction does not interrupt the drying process; the grain continues to circulate in the dryer. You can reset this malfunction by pressing the reset pushbutton located on the side of the burner. For resetting, there is no need to stop the whole dryer.

5.5.3. Frequency converter fault (H11)

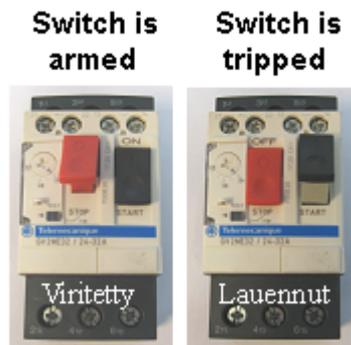
The alarm light of the frequency converter fault is illuminating, if there is some malfunction in the frequency converter. You can reset this malfunction by turning the main switch to the position 0. After this, turn the main switch back to the position 1.

The reason for this sudden malfunction can be a power failure or an undervoltage in the power network. It is advisable to control, if the gear or the motor are mechanically functioning correctly, or if there is some obstacle in the feeder.

If you cannot reset the malfunction, check if the automatic circuit breaker is tripped. Turn the main switch to the position 0, and open the fuse block covers. The circuit breaker of the frequency converter is F2.

5.5.4. Motor protective switches tripped (H12)

The alarm light, indicating a motor protective switch is tripped, is illuminating. You have to find out which motor is causing the alarm. Turn the main switch to the position 0 and then open the cover. In the electrical cabinets 200-300U the motor protective switches are F1, F3-F9. In the electrical cabinets 500-600U the motor protective switches are F1, F3-F12. The amount of motor protective switches may vary depending on the accessories. Check which one of the motor protective switches is tripped, and in this way you can find out, which motor causes the alarm. Often the reason for this fault is some mechanical blockage, or the motor has been exposed to stress.



When the problem has been solved, the motor protective switch can setup again.



When the electrician opens the doors of the main cabinet, he must turn the main switch beforehand to the position 0. The doors of the electrical cabinet must absolutely be closed!

5.5.5. General information

In the case that the same alarm several times appears, and there seems not to be any reason for the fault, please take contact to your local electrical shop or the burner supplier or to our service department.

5.6. Selector switches for the manual operation mode

5.6.1. Selector switch for the AUTO / MANUAL operation mode (S2)

By means of this selector switch it is possible to select which operation mode is used: a manual or an automatic operation mode. The automatic operation mode means that the normal working processes are chosen after turning the selector switch to the appropriate position: emptying, filling or drying. When the selector switch is turned to the manual operation mode, there are separate switches for the motors. You cannot turn the selector switch to the manual operation mode, if the dryer at that moment is in operation, that is to say, the drying process is ongoing. If you like to switch to the manual operation mode, turn first the program selector switch to the position 0. When turning the selector switch, all the manual selector switches must be in the position 0 (the conduit fans are the only exceptions to this).

5.6.2. Other selector switches for the manual operation mode (S3-S6)

All significant motors have the possibility for the manual operation mode (the elevator, the pre-cleaner, the feeder, the bottom aspirator). It is possible to use these selector switches only when the selector switch for the AUTO / MANUAL operation mode is in the position manual. Observe that the feeder is equipped with a stop, in order to prevent the feeder from an unintentional start. The elevator must rotate before starting the feeder. Observe as well that the spreader is rotating always when the elevator is rotating.



All the selector switches for the manual operation mode must be in the position 0, when the selector switch of the operation mode is used.

5.7. Selector switch for the conduit fans (500-600U S11) (200-400U S7)

With this selector switch you can choose if the conduit fans are switched on or off during the drying process. By drying e.g. the not full grain batches or turnip rape, it is possible to diminish the air flow rate by switching off the conduit fans.

By turning the selector switch for the conduit fans to the position 0, the conduit fans are switched off during the drying process. By turning the selector switch to the position 1, the

conduit fans are switched on during the drying process. You cannot choose the manual operation mode for the conduit fans.

5.8. Selector switch for the manual operation of the electrical three-way distributor (S12) (option)

The three-way distributor has an electrical control. The directions 1 and 2 are the branches of the three-way distributor; the direction 0 is the position in the middle.



You cannot change the operation mode of the three-way distributor when the grain is flowing through the distributor at that moment. If the distributor is full filled with the grain (e.g. the grain pipeline to the grain bin is blocked), you cannot change the mode of the distributor.

5.9. Digital thermostats

5.9.1. Burner 2-stage thermostat (A5/A52)

2-stage thermostat: LAE LTR.5TSRE



Function

Controller of the blowing air temperature. The display is showing the blowing air temperature during the drying process.

Indicator

Above the numerical display the LED digits beside OUT1. If OUT1 digit is on => double output.

Setting

The temperature will be adjusted by pressing and holding the function key pressed . The display is showing the temperature value which is saved in the memory. You can change this value by pressing the arrow keys up or down as long as at the same time you hold the function key  pressed. By losing the key, the new value is saved in the memory.

Example

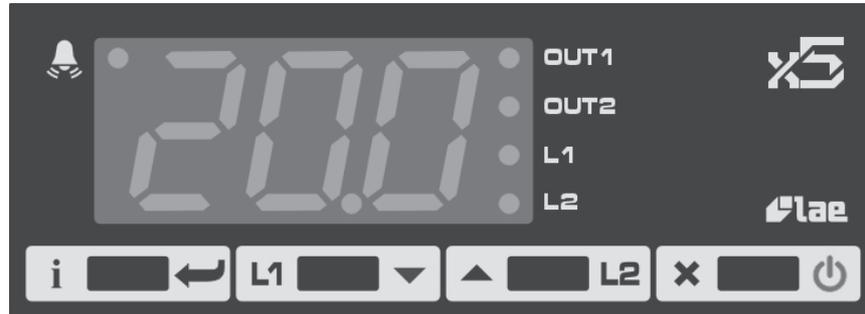
If you want the drying temperature to be 70 °C, you adjust 70 to the thermostat. Observe that this value is only the limit value of the maximum temperature. The actual blowing air temperature can be lower, e.g. due to cold air.



If your dryer is not equipped with the 2-stage burner (KP26), the thermostat (A5) in this case is used only for monitoring the blowing air temperature.

5.9.2. Drying thermostat (A1)

Regulating thermostat: LAE AC1-5TS2RW



Function

Regulating thermostat, for controlling the change-over from the mode **drying** to the mode **cooling**. The display is showing the extracted air temperature during the drying process. By starting the drying process, you must adjust the temperature to be high enough, e.g. 50°C.

Indicator

On the right side of the numerical display there is OUT1. Beside this there is the LED digit which indicates the state of the thermostat. If the OUT1 digit is not on => drying. If the OUT1 digit is on => cooling.

Setting

The value will be adjusted by pressing once the key . The display is first showing Sp1, and after this the adjusted temperature value which is saved in the memory. You can change this value by pressing the arrow key up  or down  as long as the value comes to the display. If no key is pressed for approx. 30 seconds, or if you press the key , the new value will be saved in the memory of the thermostat.

Use

The humidity content of the grain is measured by means of a humidity meter. As soon as the desired value has been achieved, you can see the current temperature on the display of the thermostat. Hereafter, adjust the thermostat value by 0, 1°C lower than the value indicated on the display.

Example

You want the grain humidity content to be 13%. The humidity meter is indicating 13%. The extracted air temperature on the display is 37, 5°C. You adjust the value of 37, 4°C to the thermostat. This forces the dryer to change over to the cooling mode, provided that the temperature still is 37,5°C.

The drying result slightly varies due to different grain types. Bearing this in mind, the practical experience will help you to find out the right values. If the blowing air has strong fluctuations of temperature, as a consequence thereof is a different drying result.

6. Troubleshooting

As follows there are listed some situations when disturbances might occur, and the fault diagnostics for these problems. If the proposed remedy does not solve the problem, call the respective service company or the manufacturer for advice.

Fault	Reason	Remedy
No reaction in the electrical cabinet	<ul style="list-style-type: none"> Automatic circuit breaker blown RCCB (residual current-operated circuit breaker) tripped Fuse of the control current transformer blown 	<ul style="list-style-type: none"> Check the automatic circuit breakers Check RCCB F10/F20
No ignition in the burner (alarm light not illuminating)	<ul style="list-style-type: none"> Power switch of the burner in the 0-position Burner thermostat not correctly adjusted Automatic fuse of the burner tripped Motor protective switch of the feeder tripped 	<ul style="list-style-type: none"> Check the power switch of the burner Check the automatic fuse of the burner Check the setting of the burner thermostat Check the setting of the drying thermostat Check the motor protective switch
No ignition in the burner (drying ongoing). Alarm light of the burner illuminating.	<ul style="list-style-type: none"> No oil Fuel filter blocked Settings of the burner not correct Burner damaged 	<ul style="list-style-type: none"> Check the oil level Check the oil ducts Check the fitting of the ducts Check/change the filter and the gaskets Reset the failure
Frequency converter fault	<ul style="list-style-type: none"> Undervoltage in the power network Mechanical problem in the feeder Power failure 	<ul style="list-style-type: none"> Check the feeder
Three-way distributor not functioning	<ul style="list-style-type: none"> Too much stress from the pipeline or from some other construction to the three-way distributor 	<ul style="list-style-type: none"> Support the other constructions and the pipeline in a proper way. Minimize the load to the three-way distributor.
Motor protective switch of the elevator tripped	<ul style="list-style-type: none"> Elevator blocked Elevator belt not tightened 	<ul style="list-style-type: none"> Check the elevator. Clear the possible blockage. Tighten the elevator belt
Dryer stopped	<ul style="list-style-type: none"> One of motor protective switches tripped Rotation control tripped 	<ul style="list-style-type: none"> Check if the fan or the conveyor is blocked. Reset the motor protective switch, or turn the power off and then on again using the main switch; in this way you can reset the rotation control.
Motor protective switch of the spreader tripped several times	<ul style="list-style-type: none"> Dryer too full Motor damaged 	<ul style="list-style-type: none"> Check the filling level in the dryer. If the filling level is too high, empty somewhat. An authorized electrician must check the motor
RCCB tripped during operation	<ul style="list-style-type: none"> One of the driven motors has residual current 	<ul style="list-style-type: none"> Call an electrician