INSTRUCTION MANUAL

R-060 BR E.01 08.08
Valid from no. R-060.0000925

Dehumidifier

RECUSORB R-060 BR

Seibu Giken DST AB
Avestagatan 33
S-163 53 SPÅNGA
Sweden

CE

Contents

General Description

Applications

DST desiccant type dehumidifiers are normally used where dry air is essential to the various manufacturing processes used in chemical, pharmaceutical, food or confectionery industries, or where a dry environment is required for storing and handling of moisture sensitive products and raw materials.

The well proven air drying technology using the **adsorption** principle provides great flexibility in solving humidity problems. It offers the user independent humidity control, down to dewpoints far lower than the effective operating range of refrigeration dehumidifiers.

Construction

The dehumidifiers are made as complete units including rotor, fans, rotor motor and rotor drive transmission, heater for the regeneration, controls and electrical equipment.

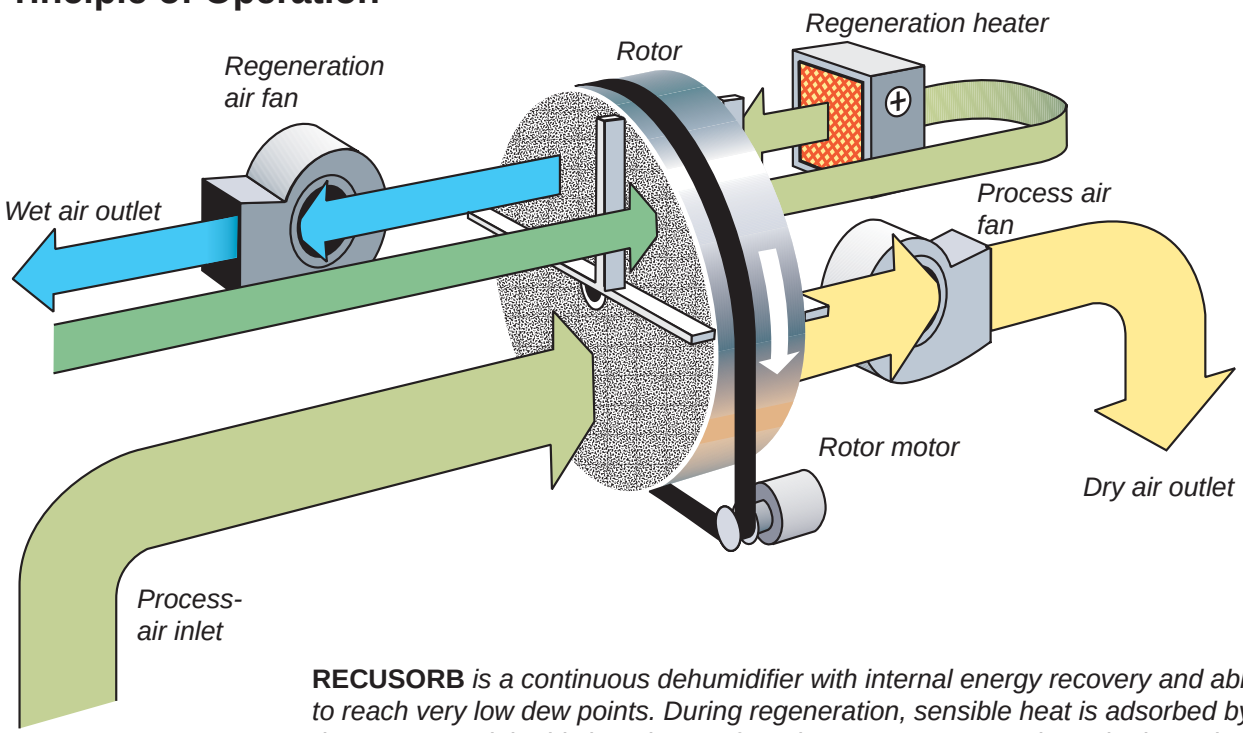
The water vapour is effectively adsorbed from the treated air in the SSCR silica gel rotor.

Principle of Operation

It works on a continuous process with two air streams of different flow rates, normally having a flow ratio of approximately 3 to 1.

The greater flow, *process air,* is dried as it passes through the dehumidifier, while the smaller flow, *regeneration air*, is used to heat the rotor material to drive the adsorbed moisture vapour from the desiccant. The moisture which is removed from the process air, is transferred over to the other as the SSCR rotor turns slowly.

Principle of Operation



RECUSORB *is a continuous dehumidifier with internal energy recovery and able to reach very low dew points. During regeneration, sensible heat is adsorbed by the rotor material. This heat is transferred to a purge sector where the incoming regeneration air is preheated and its moisture content reduced. While less heat is now required to reach the final regeneration temperature, the air will also be at a much lower relative humidity. As a result of this, the dry air outlet is both cooler and drier than that achieved by other desiccant systems.*

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Design

The dehumidifier RECUSORB R - 060 BR has a housing of stainless steel which contains rotor, rotor motor, belt, belt- pulley, regeneration fan and filters. The process fan and the electrical box are placed on top of the unit.

Dismantling

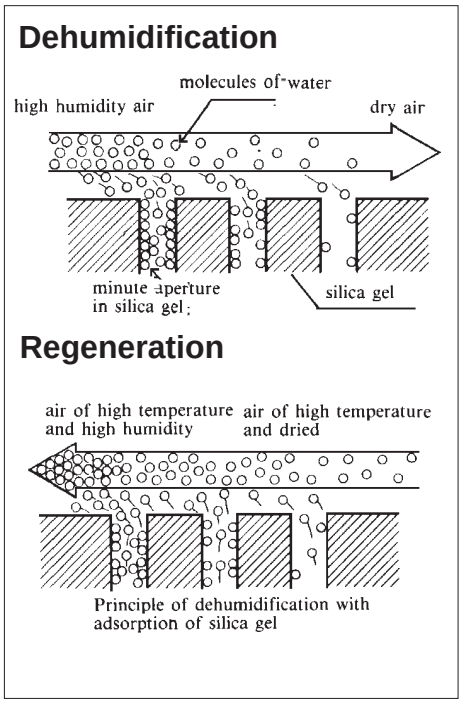
When dismantling, the unit must be electrically disconnected. The main switch shall be turned to (0). If it is necessary, it is possible to lock the switch in this position.

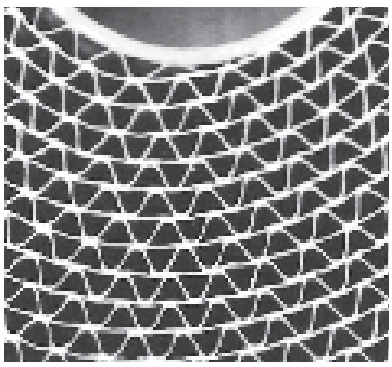
To cool the heater off the reg. fan continues to operate for 5 minutes after that the unit has been switched off. If the unit has been in operation let the reg. fan stop before dismantling.

There is an access panel at one side of the unit. Which makes inspection and service of filters and rotor motor with belt transmission to rotor easier. The access panel can be removed without any tools as it is fixed with two hand wheels. To reach the rest of the gear the other side panel and the big front panel must be removed.

Rotor

The heart of a DST dehumidifier is the very efficient patented SSCR silica gel rotor. This rotor matrix is manufactured from alternate layers of flat and corrugated sheets of silica gel and metal silicates, chemically bonded into a tissue of inorganic fibres. It is made to form a vast number of axial air channels running parallel through the structure. The large internal surface area combined with the special micro structure of the SSCR silica gel material, ensures maximum contact area to give the rotor an extremely high capacity for adsorbing water vapour. It has a galvanized sheet metal lining, spokes and a hub of steel and two bronze bearings on which it rotates around a fixed steel shaft. The rotor is driven by a single phase rotor motor with a timing belt transmission.





Rotor Matrix

Filters

The air filters are panel filters. They can be reached when the inspection panel is removed.

Fans

The two fans are of medium pressure radial type, directly driven by three-phase AC motors. Both fans hold protection class IP54.

Regeneration Heater

The electrical heater consists of two resistance elements. With the switch on the control panel the heater capacity can be choosen.

The electrical heater has one overheat protection thermostat TH1, and one heater control thermostat TH2. Both thermostats are set at the control test which takes place before the delivery. See technical data for settings.

TH2 is factory set to 160°C but should be altered if the entire heater capacity is not needed (see page 8).

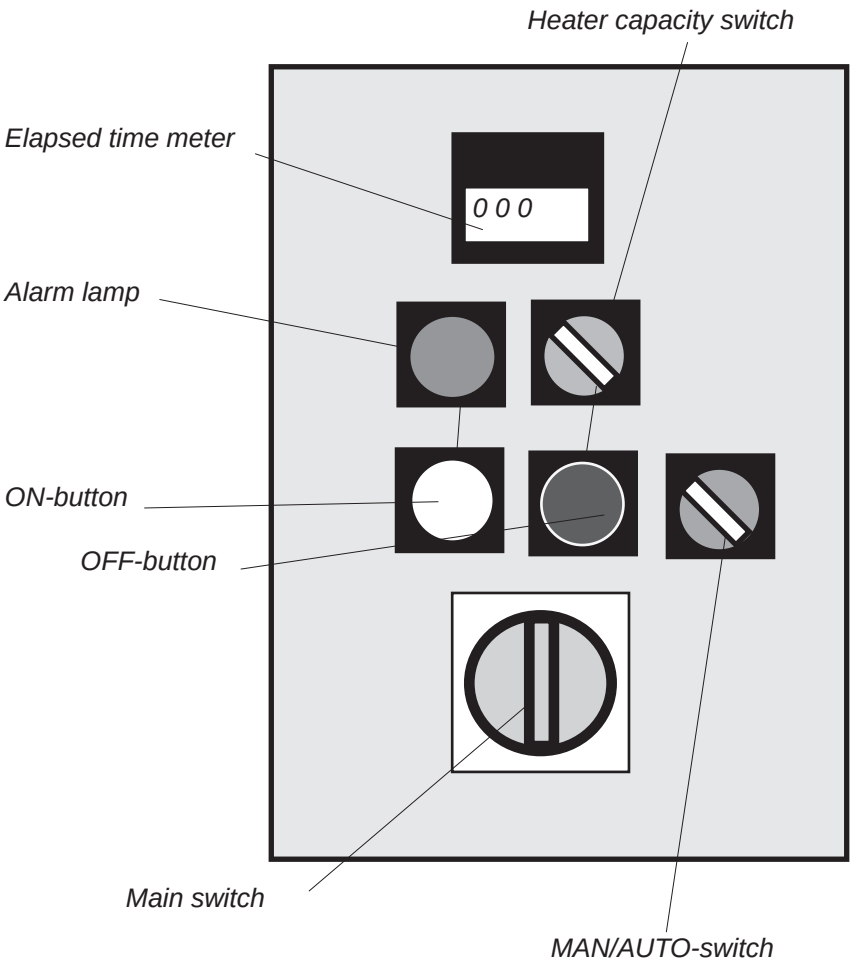
The heater thermostats, TH1 with its reset button and TH2, are placed behind the panel below the control panel.

Control Panel and Electric Box

The electrical equipment is placed on top of the unit in a sheet metal. On the front panel of this electrical box elapsed time meter, ON button, OFF button, MAN/AUTO switch, red alarm lamp, heater capacity switch and electric main switch are placed.

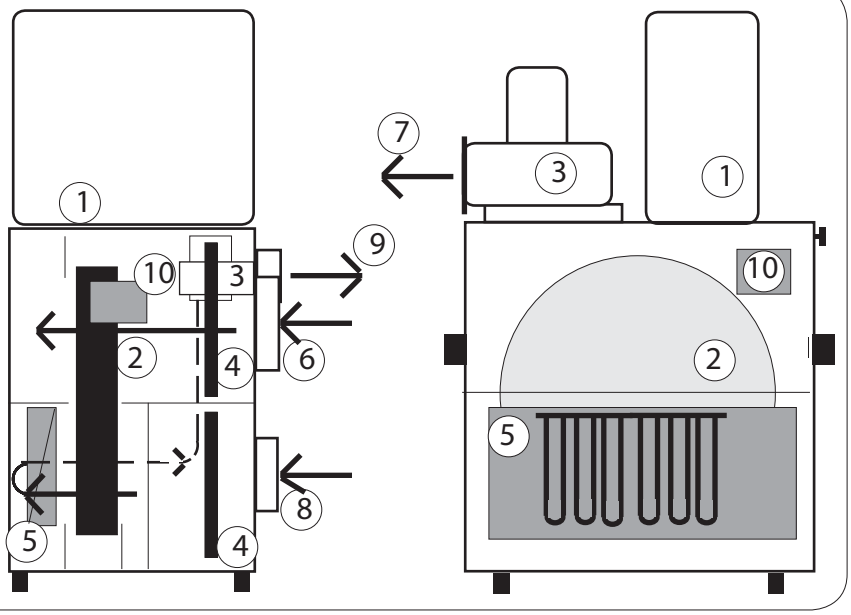
With the MAN/AUTO switch, the operation mode can be set for manual "MAN" or "AUTO". The automatic mode is used when a remote control is installed.

Control Panel



Principle of Design

1	Electric box
2	Rotor
3	Fan
4	Filter
5	Reg. heater
6	Process air inlet
7	Dry air outlet
8	Reg. air inlet
9	Wet air outlet
10	Rotor motor



When the Off-button is pushed the whole unit is switched off except for the reg. fan, which continues to operate for 5 more minutes to cool the heater off.

If there is a power failure the unit must be manually restarted because of the holding circuit.

The wet air thermostat with its reset button is placed behind the side panel below the electric box control panel. The thermostat (TH3) senses the wet air outlet temperature.

The electric box contains terminal, contactors, motor protection, and capacitor.

Alarm Function

If the unit stops and the alarm lamp is lit, check the following:

1. One of the fan motor protectors has switched off.

The set values should be according to the component list.

2. Over heat protection on the regeneration heater. Reset button (TH1) on the wall behind the panel door below the control panel. The thermostat should be set according to Technical data.

3. Wet air out temperature too high. Reset button behind the side panel below the control panel.

Possible faults:

- Rotor has stopped.
- Process fan has stopped.
- Very low moisture load in the process air.

Installation

DST dehumidifiers are prepared for easy connection to ductwork and electric supplies.

To enable inspection and service of the unit, adequate working space must be left clear in front of the unit to allow the access panel to be opened and the rotor to be removed. The free floor area along the front of the access panel should be as wide as the unit itself.

Note that at least two persons are needed in order to lift or move the unit.

The dehumidifier unit must not be used in an area where there is a danger of explosion nor to treat air with dangerous amounts of explosive substances.

Ductwork

In all cases mentioned below it is important to ensure that the wet air outlet is directed away from the regeneration air inlet of the unit. The same concern should be taken for the process air inlet and the dry air outlet.

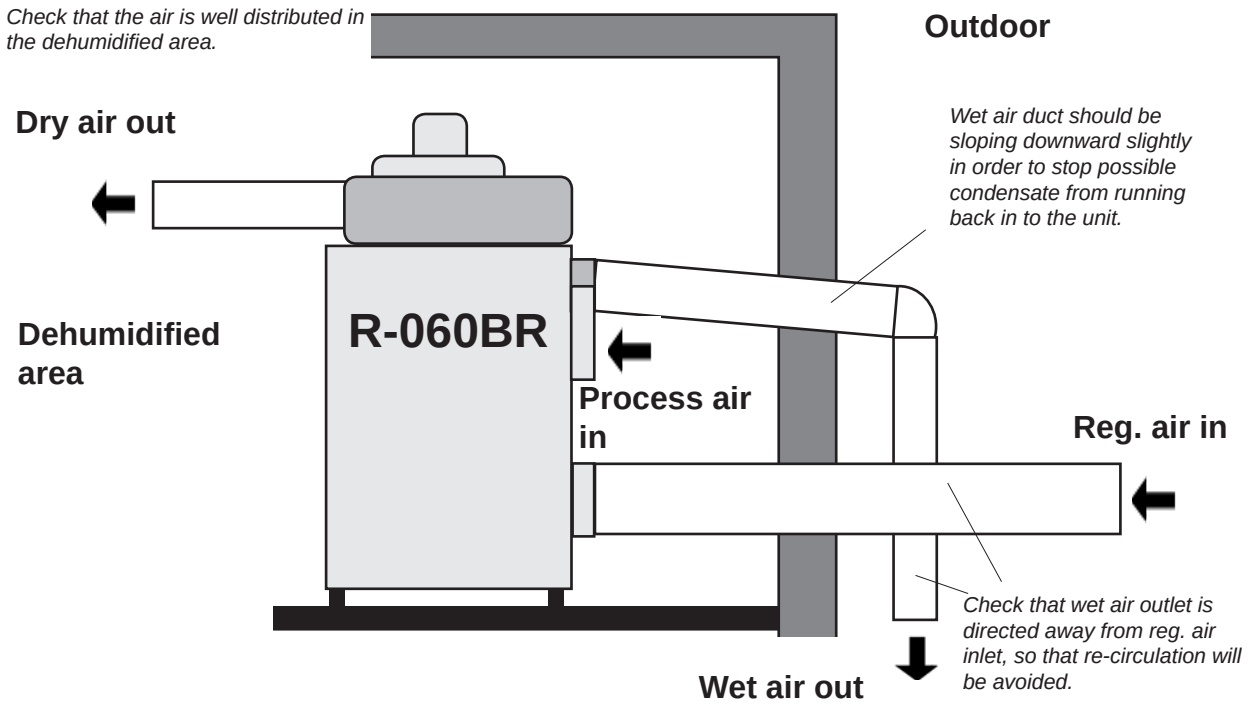
Try to minimize the ductwork to the unit as the dehumidifying capacity declines with increasing ductwork losses.

The dimensions of the ductwork connections can be found in dimension sketch in appendix.

Dampers on the outlets of the unit can be installed to control the performance of the dehumidifier. A dry air outlet damper should be installed if a lower moisture content is required. A wet air outlet damper should be installed when the moisture load in the process air is very low or if the dry air flow is decreased.

Due to the high moisture content at the wet air outlet, condensation may occur within the ductwork. It is therefore recommended that the wet air outlet ductwork is well insulated and installed at an angle so that condensate cannot

Dehumidifier Placed in Dehumidified Room



flow back into the dehumidifier. A small drain hole at the lowest point in the ductwork is to be made for discharge of condensate.

Dehumidifier Placed in Dehumidified Room

Regeneration air inlet and wet air outlet ductwork is connected to ambient. The dry air shall be well spread in the dehumidified room. The process air inlet does not need to be connected.

Dehumidifier Placed in Plant Room

Dry air supply and process air return ductwork is connected to the dehumidified area and, unless the plant room is adequately ventilated, regeneration air inlet and wet air outlet are connected to ambient.

Dehumidifier Placed Outside

Dry air supply and process air return ductwork is connected to the dehumidified area. Regeneration air inlet and wet air outlet do not need to be ductwork connected.

Electrical Connection

The electrical supply to the unit should be three phase (voltage and frequency according to electric diagram) and earth. The supply cable should be connected directly to the main switch, according to electrical wiring diagram in appendix.

The fuses should be rated as specified in the electric diagram and in accordance with local electric regulations.

A remote ON / OFF switching arrangement can be wired to the terminal block, for example a humidistat.

For quick connection of a humidistat there is a hole made in the panel for an optional plug.

As standard when the humidistat contact is open, only the regeneration heater and fan stop. The process fan and the rotor continue to run. As an option, the unit can easily be modified to be completely switched off by the humidistat. Lead 27-28 should then be moved to 28 - 30 (see the electric diagram).

Starting Up

Pre-Operation Checks

1. Ensure that the main switch on control panel is switched to "0".

2. Inspect and clean the inside of the unit from foreign objects such as rags, tools, particles of metal etc.

3. Ensure that both air balance dampers, if any, are wide open and check that the air paths of the ductwork are not obstructed in any way.

4. Check that both process and regeneration air inlet filters are securely in place.

5. Check that the electrical overloads are correctly adjusted according to component list.

6. Inspect the wiring of incoming cable.

7. Turn the "MAN/AUTO"-switch to "MAN" position.

8. Check that the rating of the electrical supply fuses is correct, see electrical wiring diagram in appendix.

9. Switch the main switch to "1" and confirm correct voltage across all three incoming phases.

10. Briefly switch the unit ON by pushing the ON button, and then switch it OFF by pushing the OFF button, watching as the process fan slows down the direction of fan rotation. If incorrect, switch the main switch to "0" and change over two of the three incoming phase supply wires, repeat 9 to 10.

Starting Up

11. Close and secure all access doors and then turn the unit on by pushing the ON-button. The white "ON-lamp" will now be lit.

12. Balance the airflows, using the dampers in the ductwork. For maximum dehumidifying both dampers should be wide open. If a greater reduction in moisture content is needed the process air damper should be throttled. If the wet air outlet gets very hot (more than 60°C) or if the maximum capacity is not needed the regeneration damper can be throttled and /or a heater step can be switched off. With the switch on the control panel the heater capacity can be chosen:

(1/1 or 1/2) If a even lower capacity is needed the controlling thermostat TH2 can be set to a lower temperature than the factory set.

If a even lower capacity is needed the controlling thermostat TH2 can be set to a lower temperature than the factory set.

The dry air moisture content (g/kg) can be calculated by following formula:

$$x_{out} = x_{in} - 1000 \times C / (V \times 1,2)$$

Where C is the moisture load (kg/h) and V is the dry air flow (m^3/h).

If a lower moisture content is needed the dry air flow should be reduced. The smaller the dry air flow, the lower the dry air moisture content.

13. Check performance in accordance with the capacity diagram in technical data.

14. If the dehumidifier is to be controlled by a remote system (e.g. humidistat) switch the "MAN/AUTO"-switch to AUTO position.

15. Check remote control operation.

Maintenance

Before dismantling the unit, for inspection or service, the following items shall be noticed:

When dismantling the main switch shall be switched to "0".

If the unit has been in operation it should be left to cool off, for at least 30 minutes, before dismantling.

The wet air duct can, if it is not insulated, be very hot.

DST dehumidifiers are designed to run for long periods with little maintenance requi-re-ments. The following items should however be noted;

A. Exchanging Filters

The filters should be inspected at regular intervals, the frequency of which can best be judged by experience. In storage applications where clean air conditions normally exist, the filter will typically require changing only every six months. In process work and dusty environments, the filter may need to be changed more often. A dirty filter will in time affect the drying performance of the dehumidifier.

On no account should the unit be operated without the correct air filters installed!

B. General Maintenance

Every two years an inspection of all internal components of the dehumidifier should be carried out, the following items being blown with compressed air and cleaned with a vacuum cleaner.

1. Gear motor and belt transmission.
2. Fans
3. Electric equipment.
4. Regeneration heater battery.
5. Access panels and seals.

Depending on how dirty the dehumidifier was at the first general maintenance, the interval of inspection may be increased or decreased.

C. Washing the Rotor

The SSCR rotor contained in DST dehumidifiers has a distinct advantage over other types of desiccant rotors in that dust and grease can be washed out of the material without any need for reimpregnation after the treatment.

Ordinary dust and dirt can be washed out with water and a mild acid based detergent while rotors affected by oil and grease should be washed in industrial alcohol. In all normal applications however it must be emphasised that this washing of the rotor should be considered as a last resort, having alleviated all other possible defects first.

The washing procedure described below is not a normal maintenance requirement and it is recommended that a trained DST engineer is consulted before proceeding.

1. Let the dehumidifier cool off for at least an hour.
2. Carefully remove the rotor from the unit, taking great care not to damage the delicate matrix.
3. Wet the rotor with water and a mild acid based detergent or with industrial alcohol and allow to soak for 30 minutes.
4. Rinse carefully with fresh water, pumped at low pressure through an ordinary hose.
5. Allow the liquid to drain from the rotor structure and blow the channels free with air. Do not hold the air nozzle too close to the rotor surface.
6. Carefully refit the rotor and its transmission belt into the unit.
7. Ensure that all peripheral and radial seals are located correctly.
8. Start the dehumidifier again and let it operate for one hour without heat before the capacity is checked. Repeat the washing with a stronger detergent if the performance has not recovered sufficiently.

Never use a strong alkaline based detergent, as this may destroy the rotor!

Troubleshooting

The dehumidifier performance can be checked very simply by feeling the temperature of the uninsulated ductwork near the unit.

Normally with the unit working at nominal conditions (with process air at room temperature) the dry air duct should be warm (25-40°C), and the wet air duct should be warm or hot (30-60°C).

If the unit does not maintain the required humidity look for the following causes.

A. If Both Dry and Wet Air Ducts are Warm

A1. Check the real moisture load and compare to design data. The unit may be too small.

A2. Check the airflow volumes, filter and adjustment of dampers.

A3. Check rotors mounting to panel.

B. If Both Air Ducts are Cold

B1. Is the unit switched on?

B2. Is any of the motor protections alerted?

B3. Check that the wet air damper is not closed.

B4. Check the regeneration filter.

B5. Check operation of the regeneration fan.

C. If Dry Air Duct Feels Cold and Wet Air Duct is Very Hot

C1. Check rotation of the rotor.

C2. Check the process air fan.

C3. Check that the dry air damper is not closed.

C4. Check the process air filter.

Capacity Test

If no fault can be found after checking as suggested above, a performance test should be carried out on the dehumidifier, proceeding as follows.

1. The different moisture contents x (g/kg), in the three airflows, can be determined by using wet and dry thermometers. To receive the moisture contents the measured temperatures shall be plotted in a psychrometric chart.

Process air in: x_{PI} (g/kg)

Process air out: x_{PO}

Wet air out: x_{RO}

2. Calculate from the actual temperatures the density of the two outlet airflows D_{PO} (kg/m^3) and D_{RO}.

3. Measure the dynamic pressure Đp (Pa) in the air ducts, by using a Prandtl tube. The dynamic pressure is measured by the difference between the static pressure in the dry air duct and the wet air duct.

Measurements shall be done in a straight part of the ductwork. To avoid faulty measurements caused by turbulent flows, measurements should not be done close to a bend or a fan.

The flow rate in each duct can be calculated as:

$$w = (2 * \Delta p / D)^{1/2} \quad (m/s)$$

Where D is the densities according to item 2.

Calculate the volume air flows, V_{PO} (m^3/h) for the dry air and V_{RO} for the wet air:

$$V = w * A \quad (m^3/h)$$

Where A is the cross section area of each duct.

4. Now determine the dehumidification capacity, Q (kg/h), by the following equation.

$$Q = (Q_P + Q_R) / 2$$

where

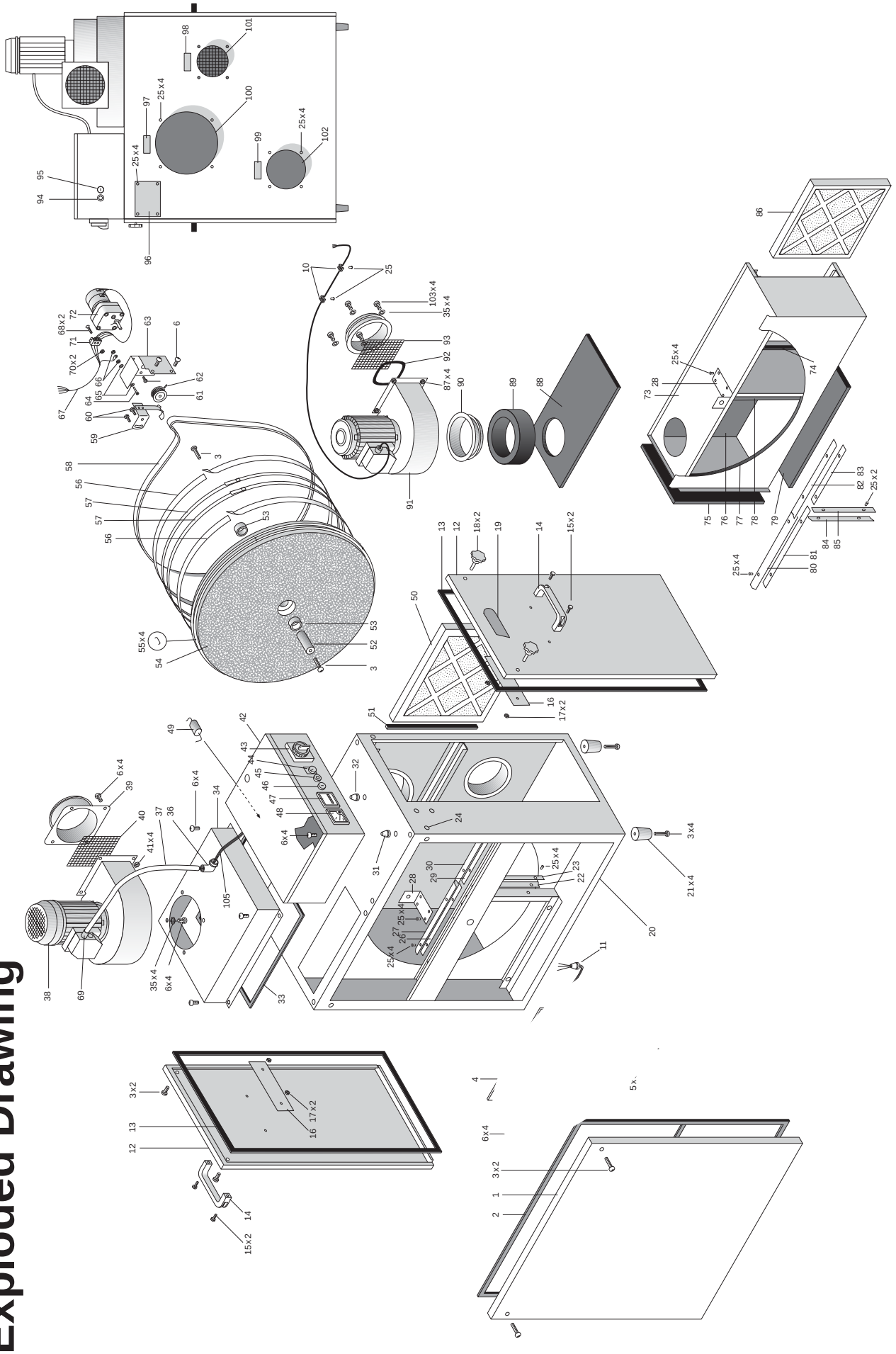
$$Q_P = V_{PO} * D_{PO} * (x_{PI} - x_{PO}) / 1000$$

and

$$Q_R = V_{RO} * D_{RO} * (x_{RO} - x_{PI}) / 1000$$

Compare this measured capacity to the capacity which can be calculated from the data sheets.

Exploded Drawing



Technical Data

Dehumidifier Model	R-060BR
Capacity [kg/h] [1]	4.6
Nominal dry air flow [m³/h] [2]	1000
External static pressure [Pa] [3]	200
Nominal wet air flow [m³/h] [4]	250
External static pressure [Pa] [3]	50
Heater power [kW]	6
Supply fuse 3x230/400V 50Hz [A]	25/16
Weight [kg]	63
Speed of rotor rotation [rph]	42
Thermostat setting TH1 [°C]	200
Thermostat setting TH2 [°C]	160
Thermostat setting TH3 [°C]	80

[1] Valid for inlet conditions 20°C/ 60%RH. For other inlet conditions the capacity can be calculated by the correction factor from below diagram.

[2] Volume flow for density 1,20 kg/m³.

[3] If no data is stated here the volume flow above is given at free blowing airflow.

[4] Free blowing airflow.

Air filter class: G4

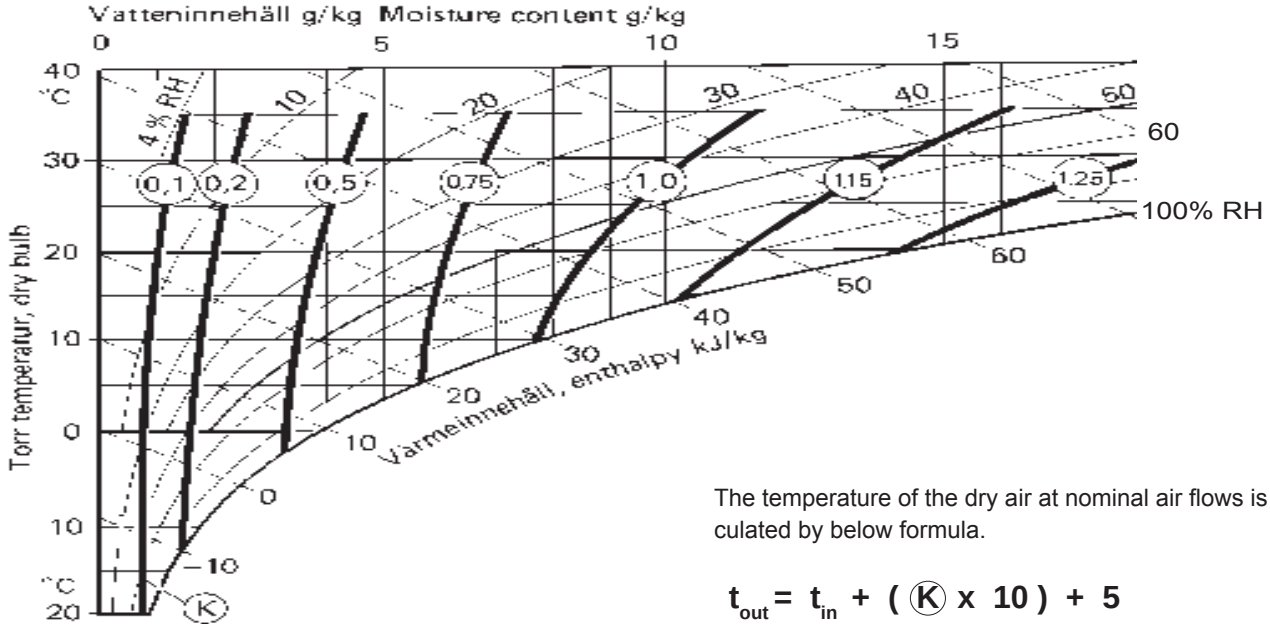
Electric compartment protection class: IP54

Humidistat connection: 230 V, 10 A

Noise level when connected to non noise protected ducts at nominal flows: 70 dB(A)

Correction Diagram

The dehumidifying capacity is estimated as the nominal capacity from above, multiplied by factor Ⓚ from the correction diagram.



The temperature of the dry air at nominal air flows is calculated by below formula.

$$t_{out} = t_{in} + (K \times 10) + 5$$

Komponentlista / Component List R-060BR

Benämning	Qty	Description	Type	Art.no	Manufact. / Suppl.
Rotor Unit					
Rotor	1	Rotor	SSCR-U 550x50mm	105416	Seibu Giken
Drivmotor	1	Rotor motor	SGM 65/30-4; 200/230V 50-60Hz; 0,5uF; 5,2W; 10rpm	104436	
Kilrem	1	Belt	2000 5M 09	100278	
Remskiva	1	Beltpulley	24 5M 09, d=8mm	100279	
Periferitätning	2	Belt drive grip	Felt/EPDM 1x25x1750mm (2x)	103131	
Teflonremsa	2	Radial seal	Teflon 25x240mm	101139	
Teflonremsa	4	Radial seal	Teflon 25x280mm	101140	
Fläktar/Fans					
Processfläkt	1	Process fan	GSF-2-180/62-95-055T Skg71-2B; 3x230/400V 0,55kW 2,3 / 1,35A	104658	
Reg.fläkt	1	Regeneration fan	GSF-2-133/62-009T 3x230/400V; 0,090kW 0,50/0,29A	101864	
Filter					
Filter process	1	Filter	405x280x16mm	102230	
Filter reg.	1	Filter	295x265x16mm	102231	
Reg värmare/Heater					
Reg. värmare	2	Regeneration Heater	3x230/400V; 50/60Hz; 6kW	101069	
Överhettningsskydd	2	Thermostat	TH1; TH3	100628	
Övrigt/Other					
Termostat	1	Thermostat	EMF-2 0-200°C, TH2	102148	
Elcentral	1	Electric box	Dwg 4000	105179	

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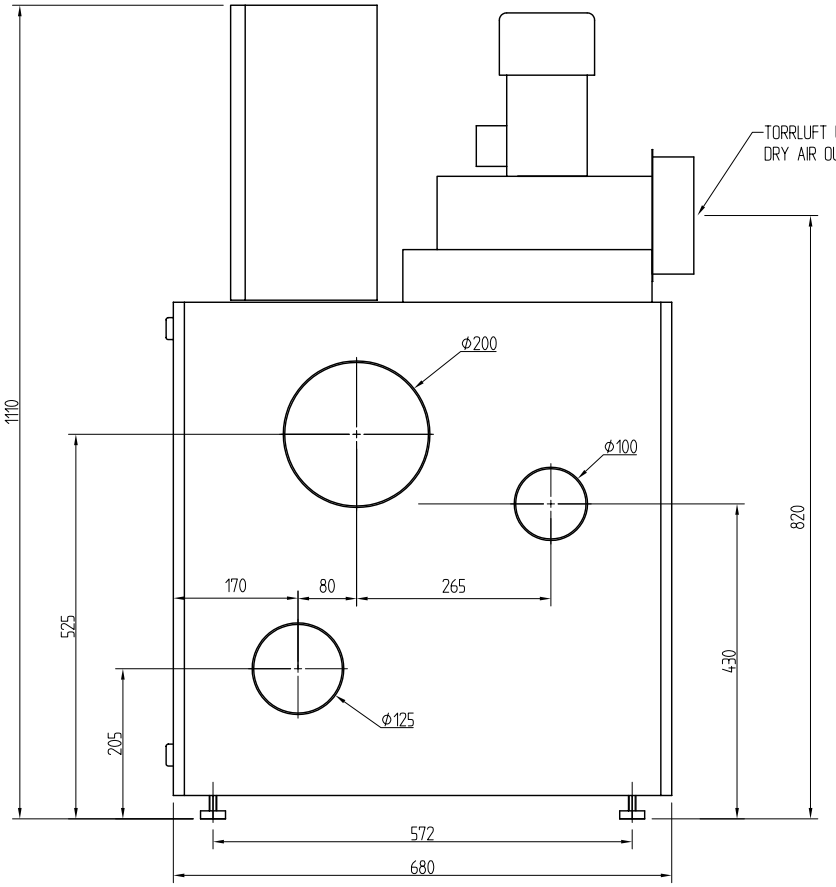
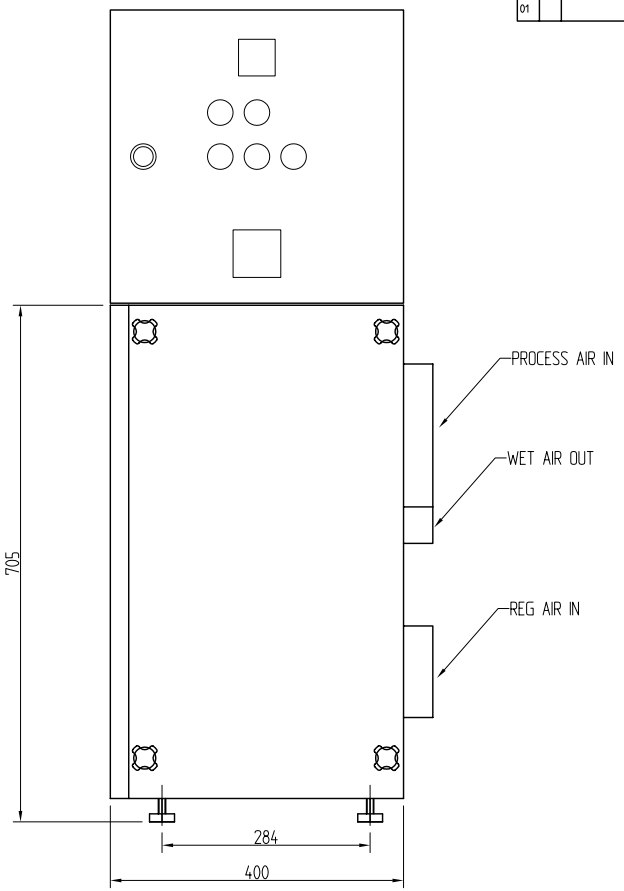
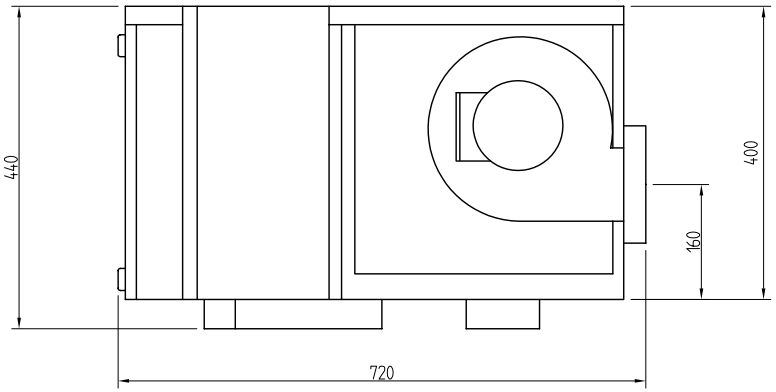
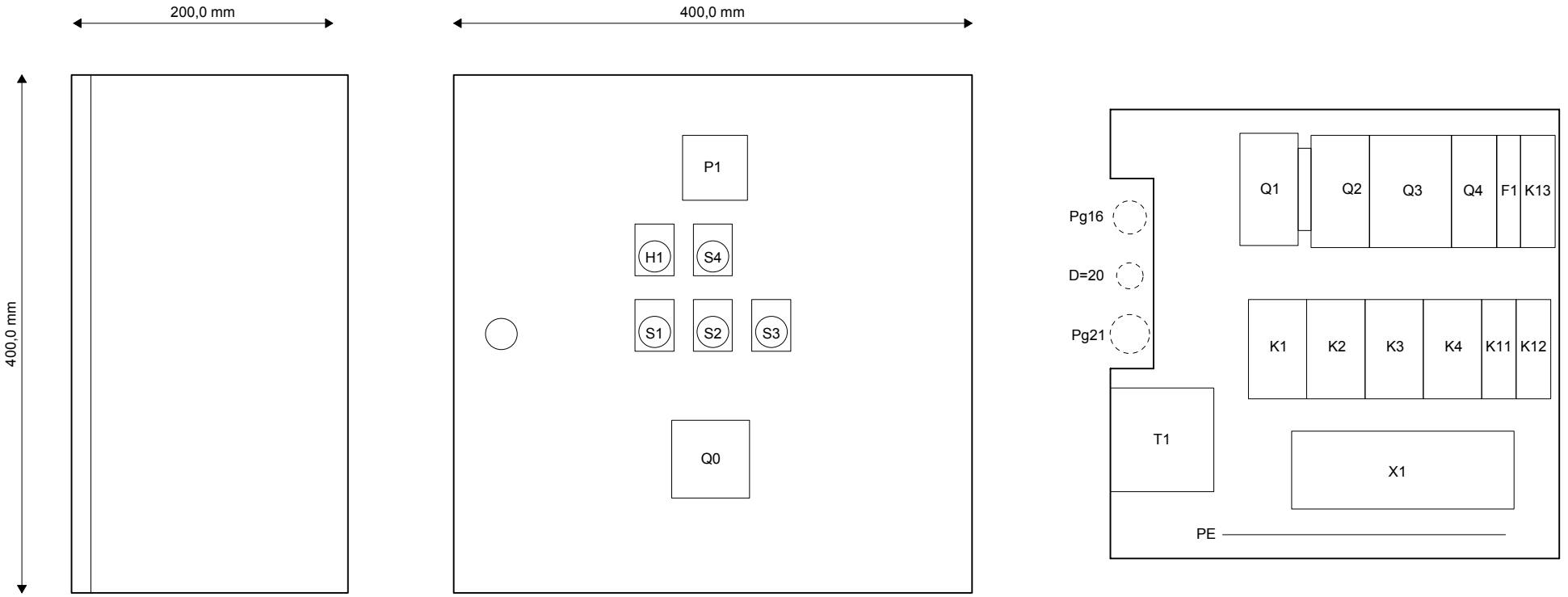
Nr	Ant	Ändring	Datum	Init.	Godk.
01		Standing el.cabinet	05-11-28	AL	







Det.nr	Ant.	Benämning	Material	Mod.nr/mne Dimension	Anm.
Konstr.	Ritad AL	Kop.	Kontr.	Stand.	Godk.	Skala 1:5	Ersätter	Ersatt av
							Filnamn	Dat. 00-09-06
DST Seibu Giken	R-060BR Installation dwg						Ritn.nr	060 1 6923.01

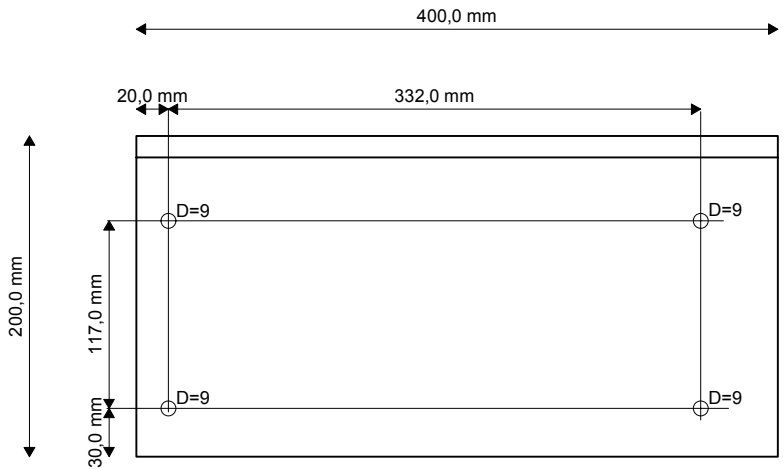


Labels:
H1=Alarm
S1=On
S2=Off
S3=Aut Man
S4=Heat
3kW 6kW

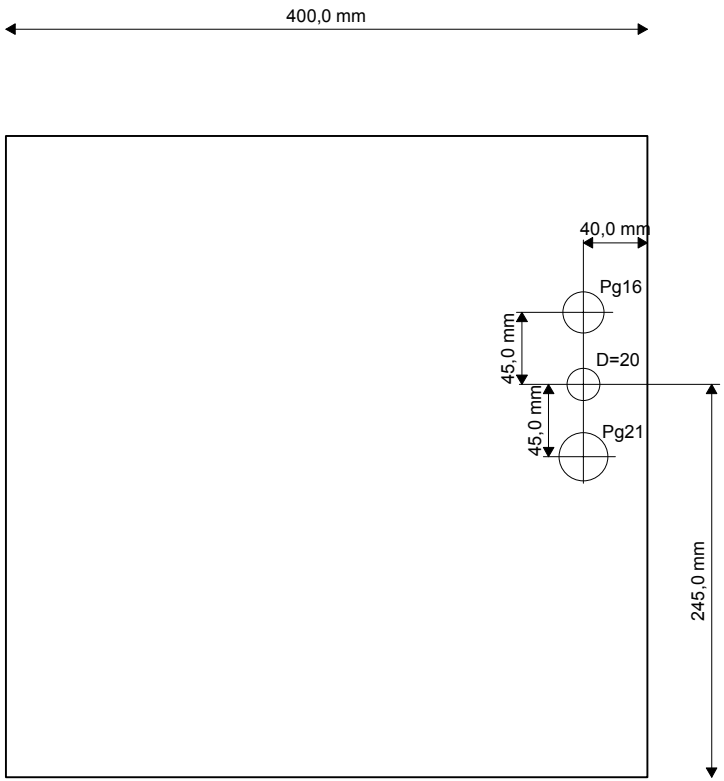
Short circuit interrupting capacit of the machine: Icu is acc. to EN60947.2
IP54
Max temp. Tamb=40C
Anslutningsmärkning
Dörr och montageplåt jordas med RK6
Plintskenan monteras med Skenstöd
Bygla X1:27-28, 20-35, 34-35

Dest.	Mount.	From	Cable/Area
M1	DST	X1	4G1,5
M2	DST	X1	4G1,5
R1	DST	X1	4G1,5
R2	DST	X1	4G1,5
T1	DST	X1	5G1,5
M3	DST	X1	3G1,5
B1	DST	X1	3G1,5
TH1	DST	X1	3G1,5
TH2	DST	X1	3G1,5
TH3	DST	X1	3G1,5
Signal	DST	X1	4G1,5

	Date	2007-05-24	Seibu Giken DST AB	Elektromontage i Järfälla	Mountingplate		+
1) Aux. Contact Q2 change	Proj.						Blatt
GVAN11 to GVAE20	Check.		R-060BR 3x400V 50Hz			4000-07	Page 1
	Norm		Date	Name			11 Pg

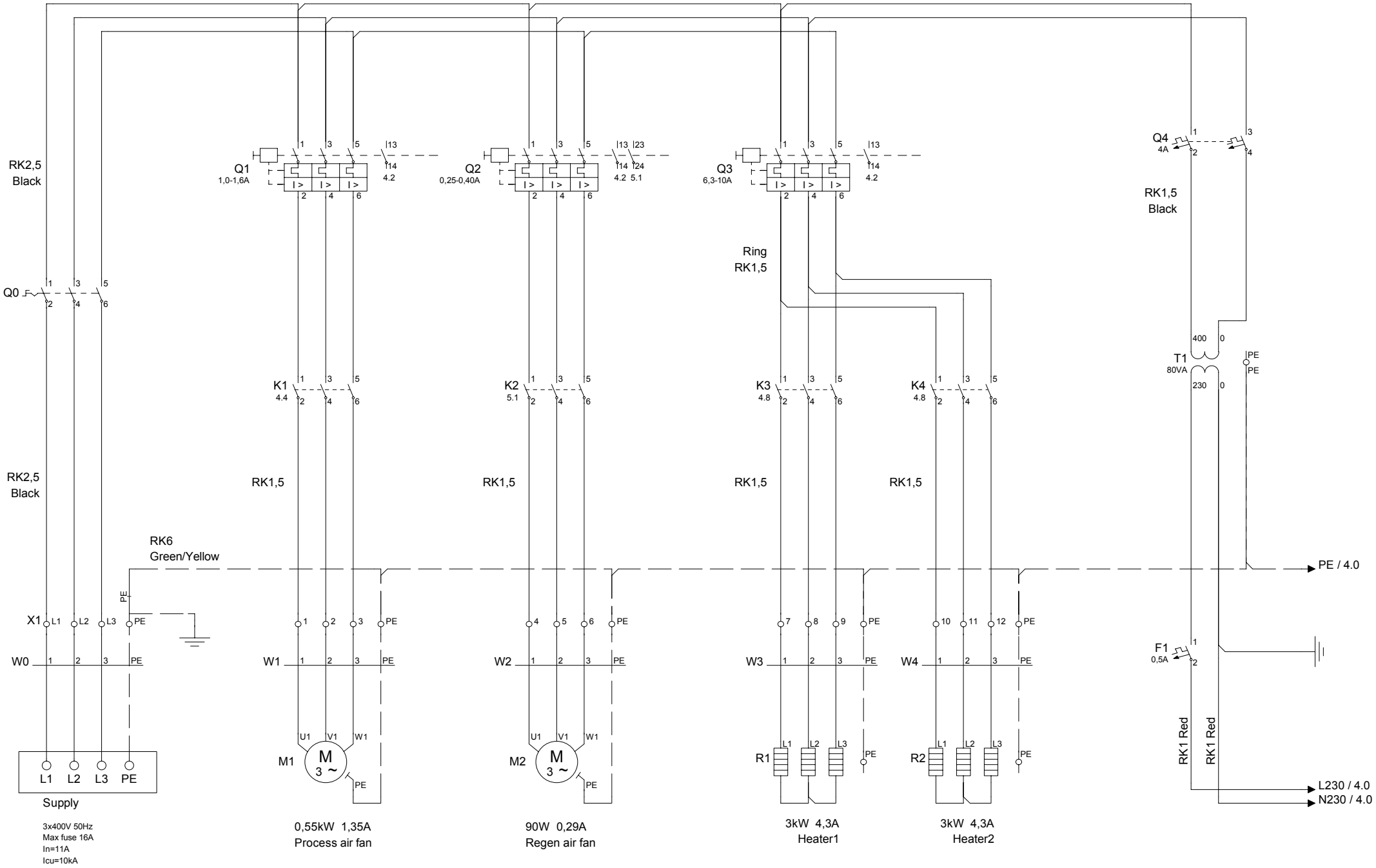


Downside

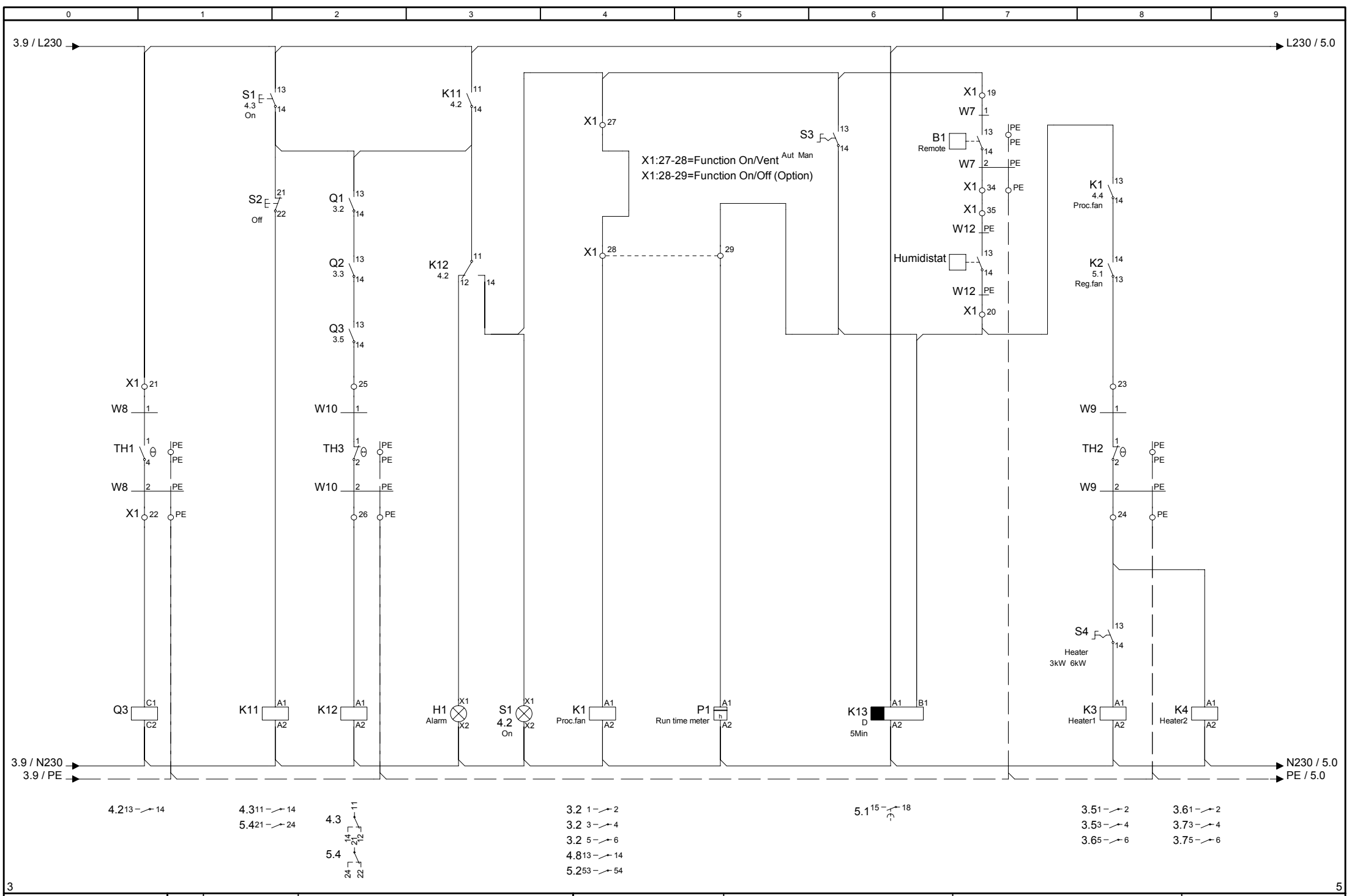


Backside

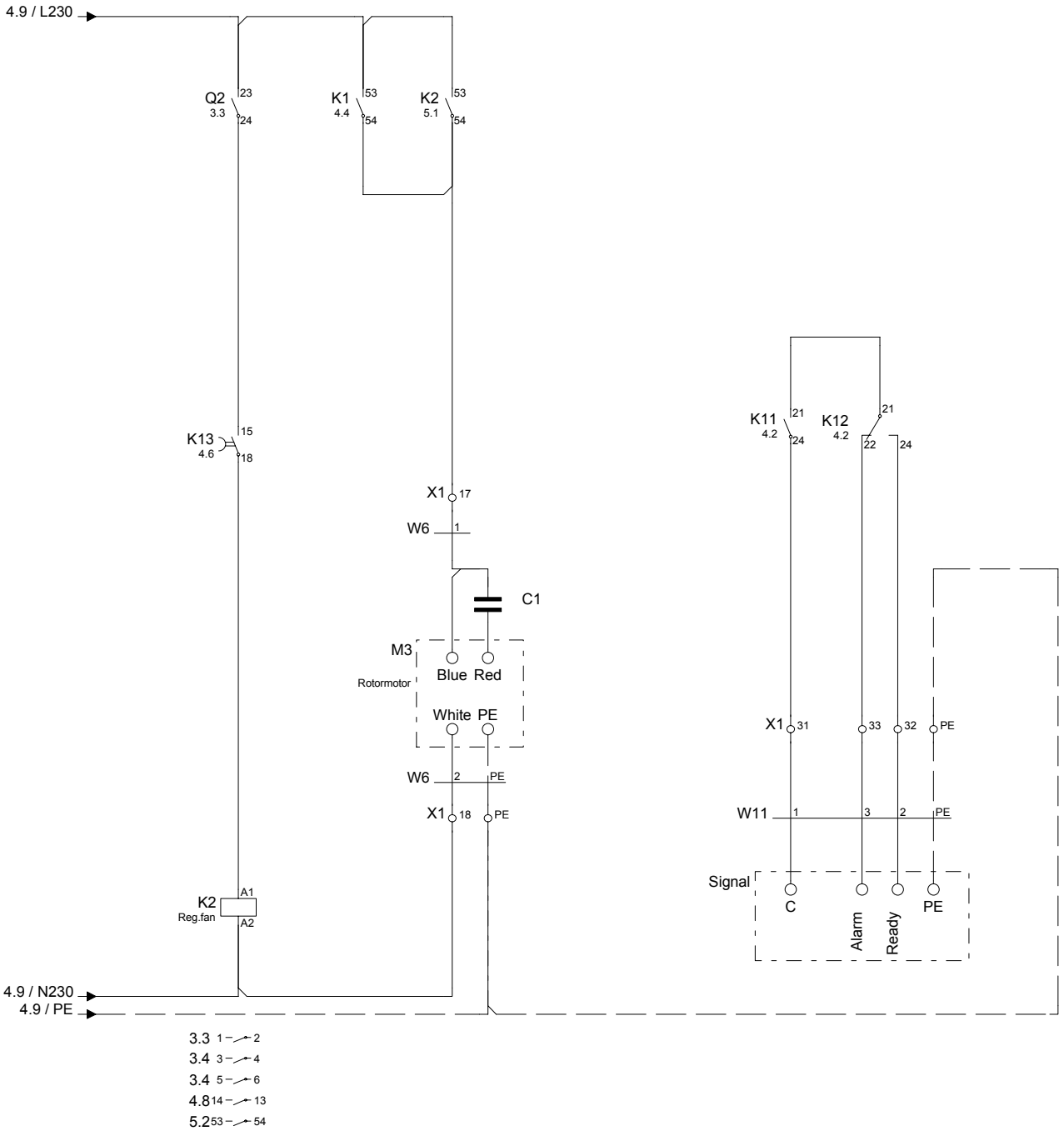
	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Mountingplate		+
	Proj.						Blatt
	Check.		R-060BR 3x400V 50Hz				Page 2
	Norm		Date	Name		4000-07	11 Pg



	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Main circuit		+
	Proj.						Blatt
	Check.		R-060BR 3x400V 50Hz				Page 3
	Norm		Drawn	Date		4000-07	11 Pg



	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Main circuit		+
	Proj.						Blatt
	Check.		R-060BR 3x400V 50Hz				Page 4
	Norm		Date	Sign		4000-07	11 Pg



4 6

	Date	Seibu Giken DST AB	Elektromontage i Järfälla	Control circuit		+
	Proj.					Blatt
	Check.	R-060BR 3x400V 50Hz				Page 5
	Norm	Drawn	Date		4000-07	11 Pg

Terminal bills of materials

Terminal strip	X1
Function text Terminal strip	
Part number Terminal strip	

Terminals				
first	Last	Sum PE	Sum N	Total
L1	PE	0	0	45

Terminal strip	Quantity	Description	Model Number	Manufacturer	Part number
L1	1	Terminal	1020100000	Weidmuller	WDU4
L2	1	Terminal	1020100000	Weidmuller	WDU4
L3	1	Terminal	1020100000	Weidmuller	WDU4
	1	Endcover	1050000000	Weidmuller	WAP2,5-10
	2	Endstop screw	1061200000	Weidmuller	WEW35/2
	1	Earth bar	E96 721 90	Ahlsell	JS15/5
1	1	Terminal	1020000000	Weidmuller	WDU2,5
2	1	Terminal	1020000000	Weidmuller	WDU2,5
3	1	Terminal	1020000000	Weidmuller	WDU2,5
4	1	Terminal	1020000000	Weidmuller	WDU2,5
5	1	Terminal	1020000000	Weidmuller	WDU2,5
6	1	Terminal	1020000000	Weidmuller	WDU2,5
7	1	Terminal	1020000000	Weidmuller	WDU2,5
8	1	Terminal	1020000000	Weidmuller	WDU2,5
9	1	Terminal	1020000000	Weidmuller	WDU2,5
10	1	Terminal	1020000000	Weidmuller	WDU2,5
11	1	Terminal	1020000000	Weidmuller	WDU2,5
12	1	Terminal	1020000000	Weidmuller	WDU2,5
13	1	Terminal	1020000000	Weidmuller	WDU2,5
14	1	Terminal	1020000000	Weidmuller	WDU2,5
17	1	Terminal	1020000000	Weidmuller	WDU2,5
18	1	Terminal	1020000000	Weidmuller	WDU2,5
19	1	Terminal	1020000000	Weidmuller	WDU2,5
20	1	Terminal	1020000000	Weidmuller	WDU2,5
21	1	Terminal	1020000000	Weidmuller	WDU2,5
22	1	Terminal	1020000000	Weidmuller	WDU2,5
23	1	Terminal	1020000000	Weidmuller	WDU2,5
24	1	Terminal	1020000000	Weidmuller	WDU2,5
25	1	Terminal	1020000000	Weidmuller	WDU2,5
26	1	Terminal	1020000000	Weidmuller	WDU2,5

Terminal bills of materials

Terminal strip	X1
Function text Terminal strip	
Part number Terminal strip	

Terminals				
first	Last	Sum PE	Sum N	Total
L1	PE	0	0	45

Terminal strip	Quantity	Description	Model Number	Manufacturer	Part number
27	1	Terminal	1020000000	Weidmuller	WDU2,5
28	1	Terminal	1020000000	Weidmuller	WDU2,5
29	1	Terminal	1020000000	Weidmuller	WDU2,5
31	1	Terminal	1020000000	Weidmuller	WDU2,5
32	1	Terminal	1020000000	Weidmuller	WDU2,5
33	1	Terminal	1020000000	Weidmuller	WDU2,5
34	1	Terminal	1020000000	Weidmuller	WDU2,5
35	1	Terminal	1020000000	Weidmuller	WDU2,5

Device list

DT	Quantity	Description	Part number	Model Number	Manufacturer	Supplier	Page
F1	1	Circuit breaker C0,5A 1P	24067		Merlin Gerlin	Schneider	3.8
			ZBY2101				
H1	1	Label holder blank			Telemecanique	Schneider	4.3
	1	Pilot light Red 230VAC/DC	XB5AVM4	ZB5-AVM4+ZB5-AV043	Telemecanique	Schneider	
J1	1	Enclosure 400x400x200	KOT 60546		Ensto	Ensto	3.9
K1	1	Contactor	LC1D12P7		Telemecanique	Schneider	4.4
	1	Auxilliary contact	LADN11			Schneider	
K2	1	Contactor	LC1D12P7		Telemecanique	Schneider	5.1
	1	Auxilliary contact	LADN11			Schneider	
K3	1	Contactor	LC1D12P7	E32 330 14	Telemecanique	Schneider	4.8
K4	1	Contactor	LC1D12P7	E32 330 14	Telemecanique	Schneider	4.8
K11	1	Relay 230VAC	20179		Song Shuan	Gycom	4.2
	1	Socket	20246	E40 209 64	Song Shuan	Gycom	
	1	Clip	39430	E40 209 66	Song Shuan	Gycom	
K12	1	Relay 230VAC	20179		Song Shuan	Gycom	4.2
	1	Socket	20246	E40 209 64	Song Shuan	Gycom	
	1	Clip	39430	E40 209 66	Song Shuan	Gycom	
K13	1	Time relay	H3DE-M1		Omron	Omron	4.6
P1	1	Run time meter 230V 50Hz	XBKH70000002M		Telemecanique	Schneider	4.5
Q0	1	Switch AC22/AC23 25/20A	OT25ET3		ABB	ABB	3.0
	1	Handle for OT16-32ET IP65	OHY2PJ	E31 712 98	ABB	ABB	
Q1	1	Auqilliary contact	GVAE20	E31 166 38	Telemecanique	Schneider	3.2
	1	Circuit breaker 1-1,6A	GV2ME06	E31 165 10	Telemecanique	Schneider	
Q2	1	Circuit breaker 0,25-0,40A	GV2ME03	E31 165 03	Telemecanique	Schneider	3.3
	1	Auxilliary contact	GVAE20	E31 166 38		Schneider	
Q3	1	Auqilliary contact	GVAE20	E31 166 38	Telemecanique	Schneider	3.5
	1	Circuit breaker 6-10A	GV2ME14	E31 165 18	Telemecanique	Schneider	
	1	Shunt trip 230VAC	GVAS225			Schneider	
Q4	1	Circuit breaker C4A 2P	24334	E21 122 50	Merli	Schneider	3.8

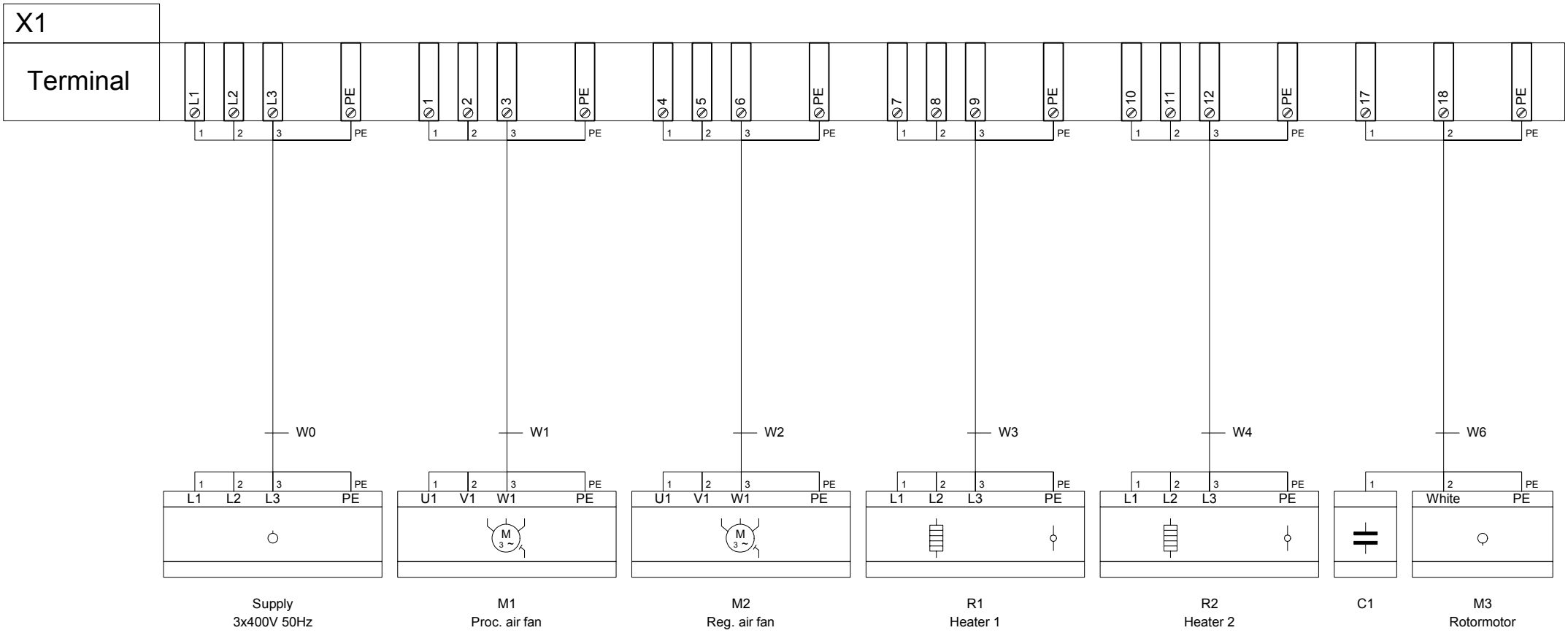
Device list

DT	Quantity	Description	Part number	Model Number	Manufacturer	Supplier	Page
S1	1	Label holder On	ZBY2101		Telemecanique	Schneider	4.2
	1	LED White 230VAC	XB5AW31M5	ZB5-AW0M11+ZB5-AW313	Telemecanique	Schneider	
S2	1	Push-button Black 1nc	XB5AA42	ZB5-AZ102+ZB5AA2	Telemecanique	Schneider	4.2
	1	Label holder Off	ZBY2101		Telemecanique	Schneider	
S3	1	Selector switch Black	XB5AD21	ZB5-AZ101+ZB5-AD2		Schneider	4.6
	1	Label holder blank	ZBY2101		Telemecanique	Schneider	
S4	1	Selector switch Black	XB5AD21	ZB5-AZ101+ZB5-AD2		Schneider	4.8
	1	Label holder blank	ZBY2101		Telemecanique	Schneider	
T1	1	Transformer 400/230V 80VA	5-063-078500		Noratel		3.8
	1	Förskruvning M25	M25 9-16	1472124		Nea	
	1	Förskruvning M25	M25 13-18	1472123		Nea	
	1	Kontramutter M25		1476534		Nea	

	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Device list: (S1 - T1)	+
	Proj.					Blatt
	Check.		R-060BR 3x400V 50Hz			Page 9
	Norm		Date	Name		4000-07 11 Pg

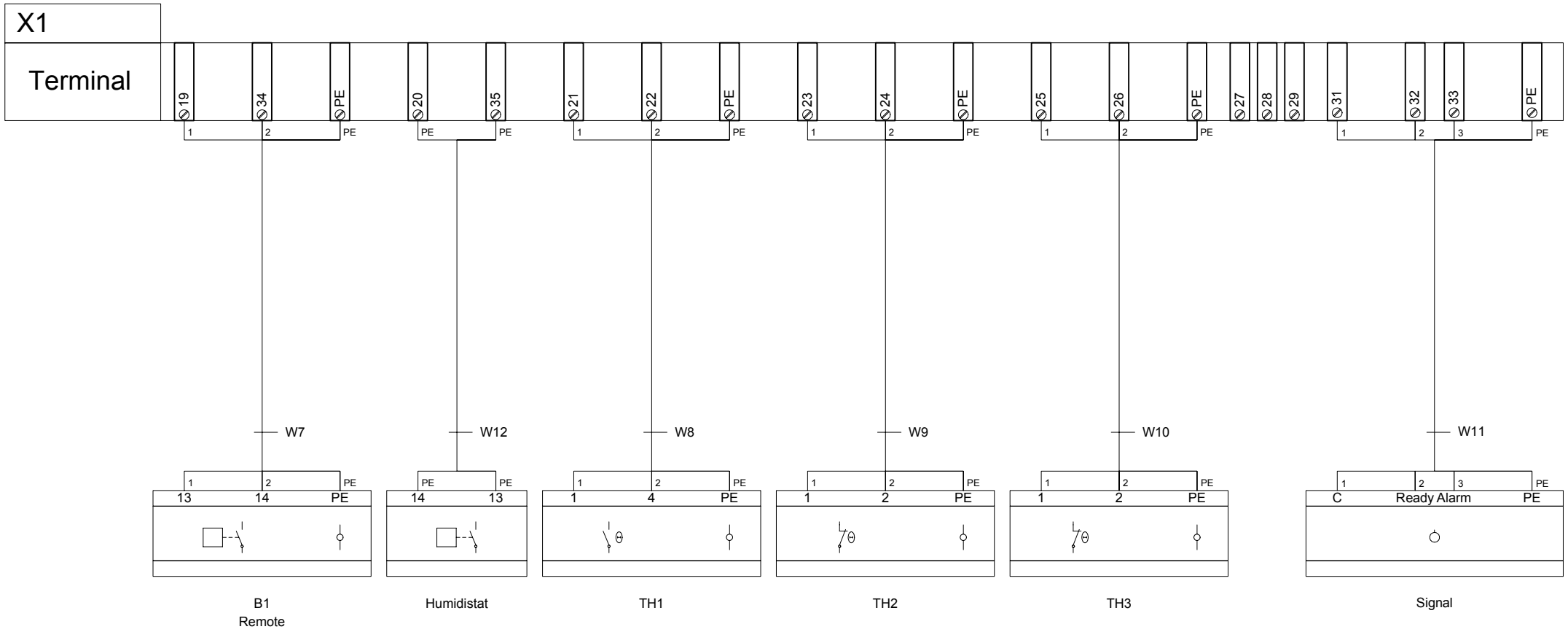
Cooke Industries - Phone: +64-9-579 2185 Fax: +64-9-579 2181 Email: sales@cookeindustries.co.nz Web: www.cookeindustries.co.nz

Terminal-connection diagram



	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Terminal-connection diagram: X1 (L1 - PE)		+
	Proj.						Blatt
	Check.		R-060BR 3x400V 50Hz				Page 10
	Norm		Date	Name		4000-07	11 Pg

Terminal-connection diagram



	Date		Seibu Giken DST AB	Elektromontage i Järfälla	Terminal-connection diagram: X1 (19 - PE)		+
	Proj.						Blatt
	Check.		R-060BR 3x400V 50Hz				Page 11
	Norm		Date	Name		4000-07	11 Pg

EC declaration of conformity

Manufacturer:

Seibu Giken DST AB
Avestagatan 33
S-163 53 SPÅNGA
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Tel: ...46 8 445 77 20 Fax: ...46 8 445 77 39

Hereby confirms that:

Machinery type R-060BR with serial number from R-060BR.0300665

a) is manufactured in compliance with COUNCIL DIRECTIVE of 22 June 1998 on the approximation of laws of the Members States relating to machinery, 98/37/EG, with special concern to Annex I in the directive concerning essential health and safety requirements relating to the design and construction of machinery, supplemented with:

1. COUNCIL DIRECTIVE, 91/368/EEG, of 1 January 1997 ammending Directive 98/37/EG on the approximation of the laws of the Members States relating to machinery.

2. COUNCIL DIRECTIVE, 93/44/EEG, of 1 January 1997 ammending Directive 98/37/EG on the approximation of the laws of the Members States relating to machinery.

3. COUNCIL DIRECTIVE, 93/68/EEG, of 1 January 1997 ammending Directive 98/37/EG on the approximation of the laws of the Members States relating to machinery.

b) is manufactured in compliance with COUNCIL DIRECTIVE of 3 May 1989 on the approximation of laws of the Members States relating to electromagnetic compability, 89/336/EEC, supplemented with:

COUNCIL DIRECTIVE, 93/68/EEG, of 1 January 1997

c) is manufactured in compliance with European Standards EN 60204-1, EN 292-2, EN 294, EN 50 081-1 and EN 50 082-1.

Spånga 25 SEPT 2003

Anders Kristoferson, Managing Director

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