

Operation instructions

for

MB 35 – 150 kW



August 2020

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Assembly

The boiler must be placed in such a way that service and maintenance can be easily performed. Dependent of the type of boiler, space is required above the boiler for possible replacement of heating elements. In general, it should be approx. 1 m free height.

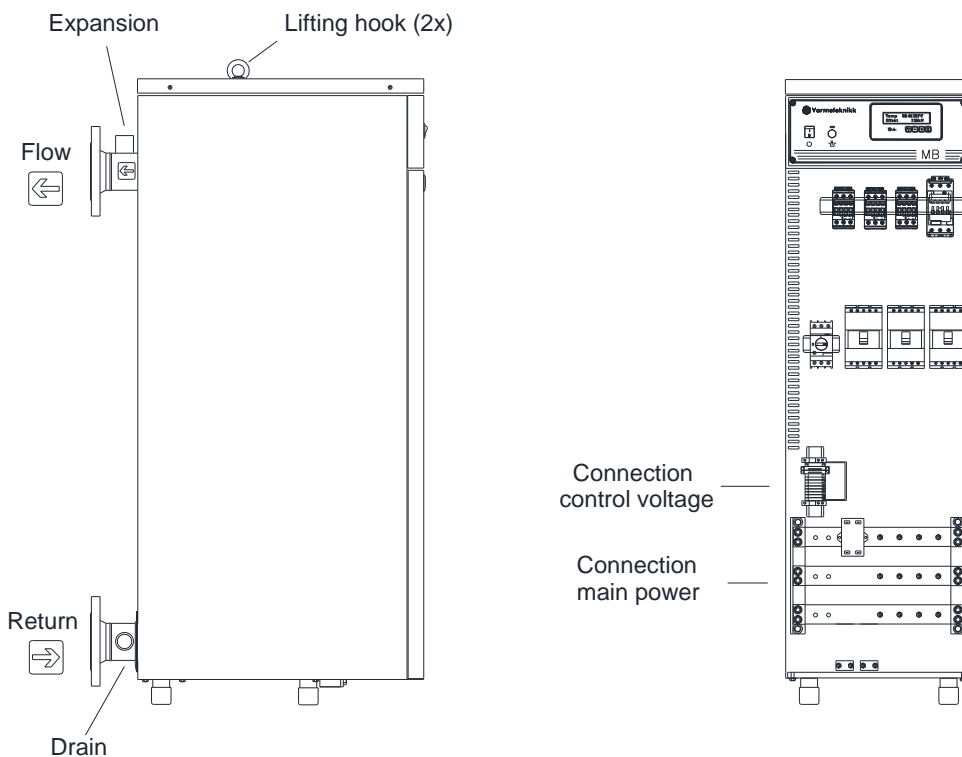
In addition, there must be space in front of the boiler and on the sides for access to the top cover screws.

This is to be able to perform service and maintenance without hindrance.

Safety valves

Plant with closed expansion vessel, shall be equipped with 2 pcs. safety valves located between boiler and expansion vessel. There should be no shut-off between the boiler and safety valves.

Safety valves and expansion vessels must be dimensioned in accordance with the system's boiler performance. Boilers below 100 kW must have at least one safety valve. The outlet from the safety valves must be laid down to the floor. The opening pressure of the valves must not exceed the maximum permissible operating pressure.



Connection

Supply cables are connected to the boiler's busbars on the inside of the door.

In addition, the boiler requires its own course for control current (230 V).

The connection is made on separate control fuses mounted on the boiler's plate, see page 10.

Commissioning

NB! BEFORE STARTING, CHECK THE FOLLOWING POINTS:

- Check that the boiler and the system are filled with water and that the system is tight.
- Check that the system is ventilated.
- Check that there is circulation on the system and that the water goes the right way through the boiler.
- Check that the system has min. 0.6 bar overpressure to avoid boiling.
- Check that the boiler is connected to the correct voltage.

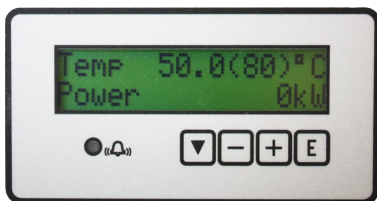
NB! ALL ELECTRICAL CONNECTIONS MUST BE TIGHTENED BEFORE INSERTING VOLTAGE ON THE BOILER.

Do not start the boiler if there is a risk that the water in the boiler may be frozen.

Start-up

The boiler is started by switching on the control switch in the front of the boiler. The display will after a few seconds display actual water temperature, as well as set temperature in parentheses. The line below shows the switched-on power. The boiler will now gradually begin to enter the power required to achieve the set temperature.

NB! If the boiler is controlled from an SD system, a lack of signal from here can prevent the boiler from starting.



The set temperature is set to 80 ° C at the factory. This can be changed by pressing the +/- button. Then the E button to save new value. The step time is set to 40 seconds and should not be set lower as shorter step time will lead to unnecessary wear on the contactors. It is normally not necessary to make other settings on the controller.

The regulator

The boiler regulator is of the binary proportional type and integrative for temperature control. It is adjustable between 5 - 100 ° C. A hysteresis of 2 ° is included in the proportional control and counteracts unnecessary switching of power steps. The integration time depends on the step time and cannot be set manually. The controller has the option of power control and outdoor temperature compensated set temperature. Inputs for 0-10 V for remote control of either power or temperature are also included. A 2-line display shows actual temperature, set temperature (in brackets), number of connected power steps and switched on power. An alarm LED is located below the display and will flash if an error occurs. In addition, the alarm relay will drop. Possible errors can be:

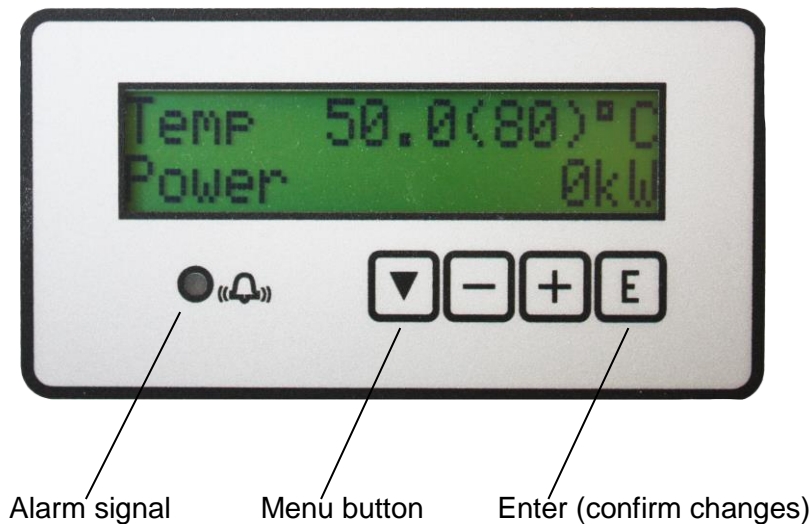
Sensor fault: Short circuit or breakage of sensor or sensor cable

Alarm power: Circuit breaker not switched on, possibly tripped, safety thermostat (STB) tripped

Alarm network: Control voltage to regulator too low (<190 V) or fault in regulator

Settings on the controller

The controller is pre-set at the factory with a set temperature of 80 °C and a step time of 40 seconds. If you want to change the settings, this is done as follows:



Temperature setting:

The desired boiler temperature is adjustable between 5 - 100 ° C. By pressing the «+/-» button, the desired temperature is selected. Holding down the button will change the value faster. New temperature is saved by pressing the «E» button. If this is not done, the controller will return to the original value after about. 4 min.

Step time:

From the factory, the step time is set to 40 seconds when power steps are switched on, and 5 seconds when switching off. To prevent unnecessary wear on the contactors, this should not be set lower. If you still want to change this, the step time is adjustable between 1 - 250 seconds when switching on power steps. The step time is changed as follows:

With a press of the menu button, the menu for «Step / Step time» appears. With a press of the «+/-» button, the display will now show:



To get down to the line with step time, press the menu button once. With the «+/-» button, the desired step time is set. New step time is saved by pressing the «E» button. If this is not done, the regulator will after approx. 4 min. returns to original value. By pressing the menu button twice, the controller will return to normal display, «Temp / Power», see page 12.

Power limitation I:

If the boiler is too large for the plant or for some other reason you want to limit the maximum power of the boiler, this can be done by limiting the number of power steps. In the menu for «Step / Step time», press the «-» button until the desired power step appears in parentheses. Pressing the «E» button saves the new value. If this is not done, the controller will return to the original value after about. 4min. See also Power Limit under the Additional Features section.

Additional features

The controller has built-in a number of functions in addition to several inputs for remote control.

Power limitation II (step limitation)

If the boiler for one reason or another is too large for the plant, the boiler can easily be limited for smaller effects. A potentiometer placed on the circuit board is adjustable from 0-100%. The boiler can only be limited to the entire power stage.

External start/stop of boiler

The controller is equipped with an input for external start/stop of the boiler. This input can, among other things, be used by the E-plants in connection with interruptions in the electricity supply by accidental power. The signal may be inverted by moving a latch on the controller board. Connects to terminal block list –X1, clamps 1-2. See also page 11 and page 35.

Outdoor temperature compensation

The controller is prepared for control depending on the outdoor temperature. If an outdoor sensor is connected, the set temperature will be adapted to the outdoor temperature. The slope curve determines how much the boiler temperature should change in f.h.t. change in outdoor temperature.

With the curve «parallel», it is determined how high the temperature of the boiler should be in relation to a given outdoor temperature. When the outdoor sensor is switched on, the display will show:

TempU	47.0 (50)°C
Power	60kW

NB! The boiler's operating temperature must be set high enough so that this does not limit the maximum temperature the boiler can reach. The internal set temperature will, after the outdoor sensor is connected, act as a maximum thermostat, and will not be able to be changed or exceeded.

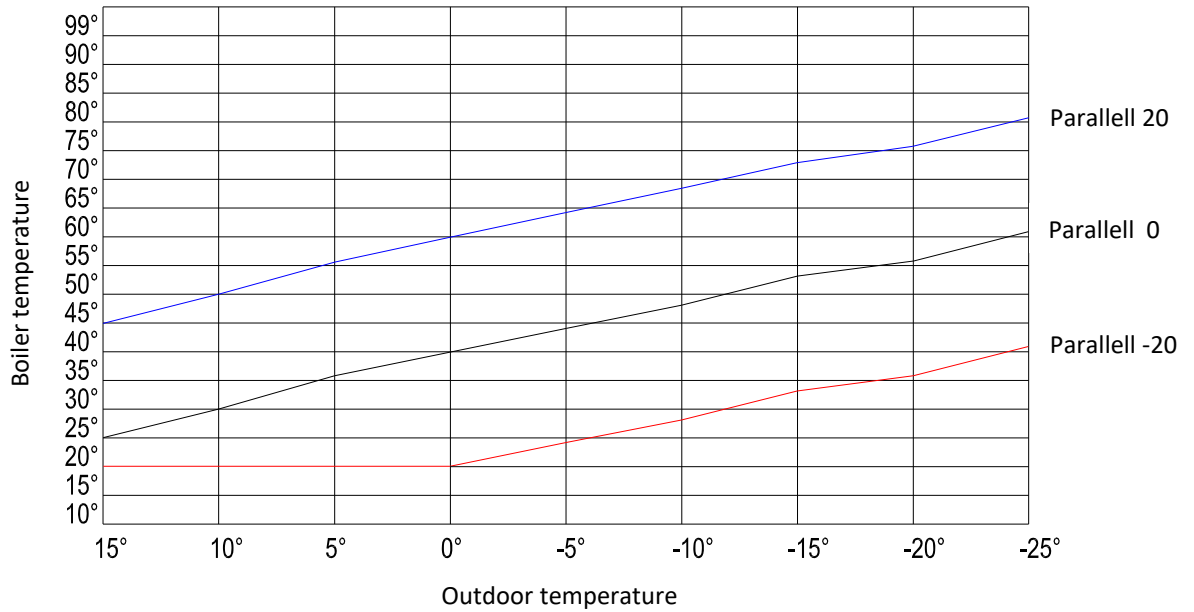
Temperature (in brackets) is a calculated trip temperature depending on the current outdoor temperature. This cannot be changed. With two presses of the menu button, the outdoor temperature and the selected curve for parallel displacement can be read in the display.

Outdoor temp	5°C
Parallel	0°C

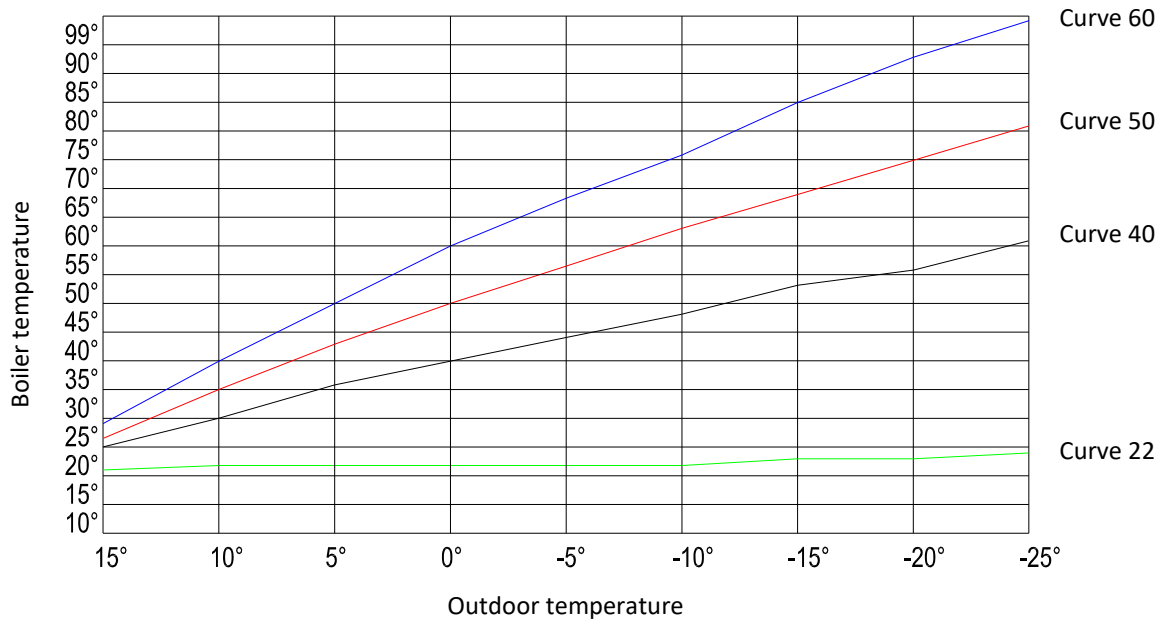
Factory outdoor temp compensation curve:

Parallel: 0
Curve: 40

Boiler temperature as a function of outdoor temperature.



Parallel	20	45	50	56	60	64	68	73	76	81
	0	25	30	36	40	44	48	53	56	61
	-20	20	20	20	20	24	28	33	36	41



Curve	60	29	40	50	60	68	76	85	93	99
	50	27	35	43	50	57	63	69	75	81
	40	25	30	36	40	44	48	53	56	61
	22	21	22	22	22	22	22	23	23	24

Parallell and inclination adjustment

If the set temperature that the controller calculates is too high or low, the curve "parallel" can be shifted up or down. By pressing the menu button twice, the display shows:

Outdoor t.	-15°C
Parallel	0°C

With the «+/-» buttons the curve can be set between -20 and +20. New value must be saved by pressing "E" button. If the travel temperature is not high enough on cold days, the inclination curve can also be adjusted. By choosing a steeper curve, the trip temperature can be further increased. Adjustment of the slope is made in the service menu, see page 12. In the menu «slope» the desired curve is set with the «+/-» buttons. New value is saved by pressing the «E» button.

Curve	40°C
Curve min	60°C

With the «+/-» buttons the slope can be set between 22 and 60. New value must be saved by pressing «E» button. With Slope min, you can set a minimum limit of how low you want to allow the temperature to drop.

See an overview of the menus on page 11.

Remote control with external signals

The boiler has several possibilities for remote control from e.g. SD system (central operating system). The regulator has an input for external start/stop of the boiler and with a 0 -10 V signal, the boiler's operating temperature or power can be controlled.

External start/stop of boiler

Connection is made on the boiler's terminal block X1. The factory fitted latch between terminals 1 & 2 is removed. See page 10.

Temperature control 0-10 V

The desired set temperature can be controlled with an external signal 0 -10 V where 0 V = 0 ° C, 10 V = 100 ° C (V1725). The connection is made on terminals 30 (-) and 31 (+) on the controller board. The input must be activated in the service menu, see page 12. In the «Temp IN» menu, this is set to «ON» by pressing the «+» button twice. Then press the «E» button to save a new value.



Press the menu button until the display shows «Temp / Power» again. With external temperature control switched on, the display shows:



NB! With external temperature control, the set temperature on the controller will function as a maximum thermostat. This must therefore be set to the maximum desired temperature so as not to limit the boiler.

Step / power control 0 - 10 V, possibly 10 - 0 V

The boiler's power can be controlled with an external signal 0 -10 V. However, the effect can only be controlled at the entire effect stage. 0 V = 0 steps, 10 V = all steps (7). The connection is made on terminals 29 (+) and 30 (-). The input must be activated in the service menu. In the «Power IN» menu, this is set to ON by pressing the «+» button twice. Then press the "E" button to save a new value.

NB!

If the signal is inverted, ie 0 V = all steps and 10 V = 0 steps, this is done by pressing the «+» button 3 times. Then press the «E» button to save a new value.



Press the menu button until the display again shows «Step / Step time». With external step control switched on, the display shows:



Signals for SD systems

The boiler is prepared for control from central operating control (SD system). Operation and failure signal is presented to terminal block X1 in the boiler.

Operation signal: indicates switched on boiler (control voltage on). Connects to the boiler terminal block X1, clamps 3 & 4.

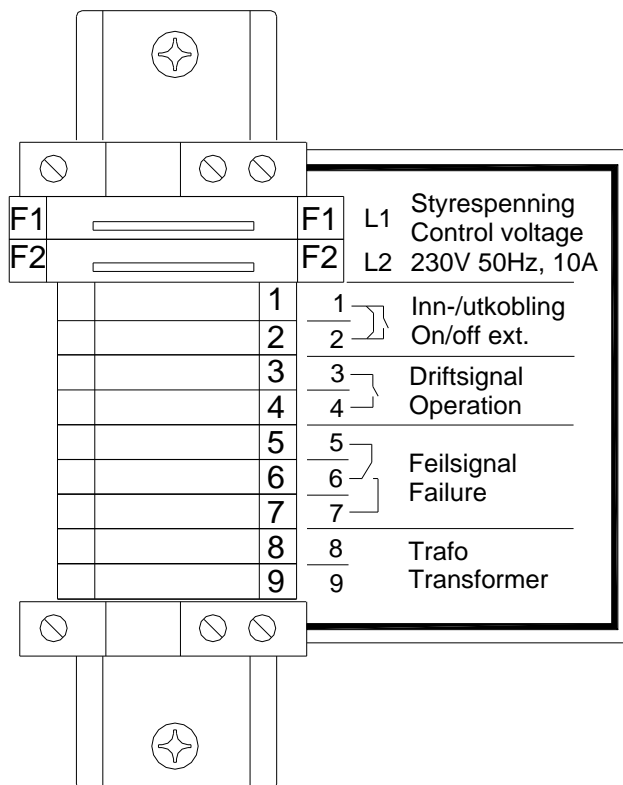
Failure message: indicates triggered safety thermostat, temperature sensor fault or low control voltage to the controller. The error that has occurred can be read in the display.

In addition to temperature and power control with 0 - 10 V signal, the boiler is also prepared for power regulation, ie. the boiler can be controlled so that it has the power that is available at any given time based on a given subscription limit.

In addition, there are the following outputs:

- Output for indication of set temp. (0-10 V)
- Output for indication of real temp. (0-10 V)
- Output for indication of real time step / power (0-10 V)

Terminal block X1 in the boiler



Menus

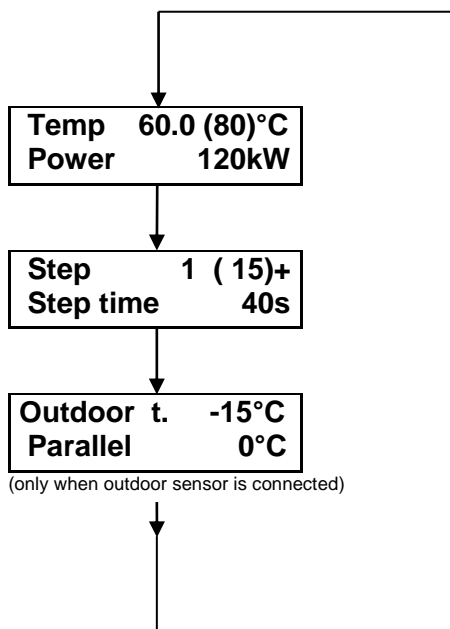
By pressing the arrow (▼) button you can scroll through the different menus.

At startup:

EL 7	v1725
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EL 7 : 7-step controller
V1725: version

Main menu



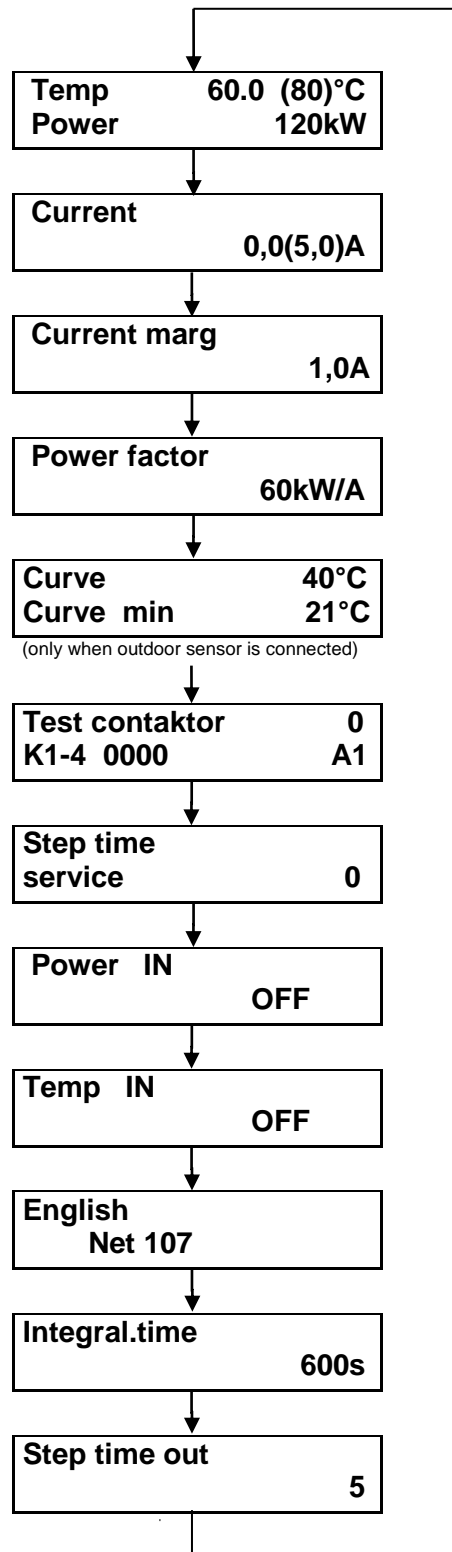
In the main menu following adjustments are available:

- Adjustment of set temperature
- Adjustment (limitation) of max available steps
- Adjustment of step time

NB! Short step time will reduce the lifetime of the contactors.

Service menus

For access to service menu, press and hold arrow button for min. 5 sec.



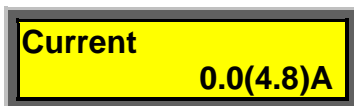
Power control

On systems with varying current loads, the electrical subscription can be utilized to the maximum by using power regulation. The total power is measured in the building's main switchboard and by means of the boiler's regulator, the power that is available below the subscription limit is supplied at all times. Necessary equipment is 3 pcs. measuring transformers for placement in the building's main board and 3 pcs. secondary transformers for connection to the controller.

Example:

The building's maximum load is 200 kW, which at 400 V corresponds to 289 A. Suitable current transformers for the system, 300/5. The factor for this will then be: $300: 5 = 60$. The system is desired to be regulated at a maximum of 289 A, which gives 4.8 A. ($289: 60 = 4.8$).

Settings must be made in the service menu. By holding the menu button inside min. 5 sec. you will have access to this. With the «-» button the current limit is set to 4.8 and the new value is saved by pressing the «E» button.



Calculation of appropriate current margin

When the power limitation has limited the boiler to a certain power, you get to a point where a step will constantly switch on and off. To prevent the boiler from switching on and off the power stage, a certain "power margin" must be available before a new stage enters. This margin should be at least the current corresponding to the difference between two arbitrary power levels on the boiler. If the power levels are different, the calculation should be performed according to the largest power level.

The value is calculated according to the following formula:

$$\frac{P \times I_s}{U \times \sqrt{3} \times I_p}$$

P = The boiler's largest power change in W between two stages

U = Main voltage at the system

$\sqrt{3} = 1.732$

I_p = Max. primary current on the plant's current transformers

I_s = The secondary current on the system's current transformer (normally 5A)

Example:

The boiler is 140 kW with a 7-stage regulator.
Largest power change 20 kW, current transformers on 200/5 A and main voltage 400 V.

$$\frac{P \times I_s}{U \times 1.732 \times I_p} = \frac{20000 \times 5}{400 \times 1.732 \times 300} = \frac{100000}{207840} \approx 0.48$$

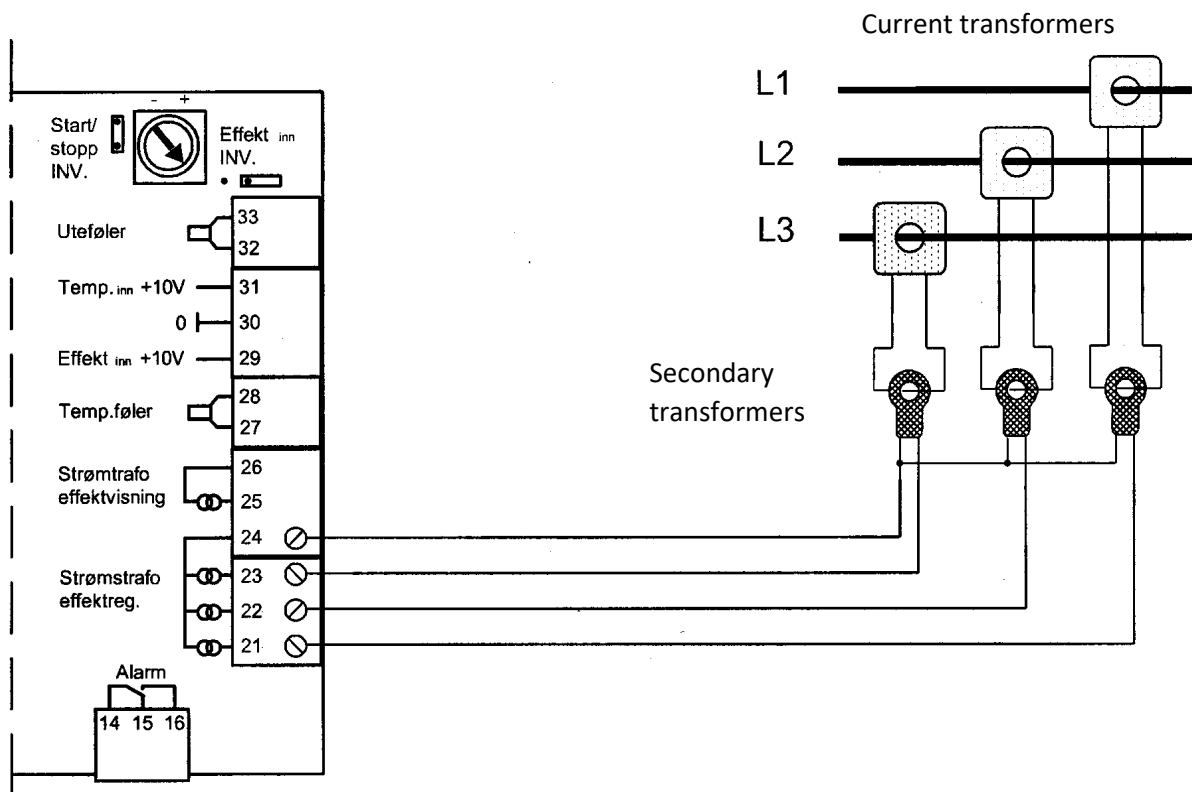
To avoid ending up too close to the limit for self-oscillation in the system, you should set the power margin approx. 0.1 higher than the calculated value. In the example above, this entails a setting of 0.58.

The setting must be made in the service menu. By holding the menu button inside min. 5 sec. you will have access to this. With two presses of the menu button you will have access to setting the current margin.

With the ± buttons, the current margin is set to the calculated value, 0,6. The new value is saved by press the «E» button. See also page 12.



Connection of current transformers for power control



901 310

Maintenance

DO NOT START REPAIR AND MAINTENANCE UNTIL THE BOILER IS DISCONNECTED

To avoid unnecessary downtime, the boiler should be inspected annually. This can advantageously be done before the boiler is put into operation in the autumn. The inspection should include the following points:

- Check the boiler for leakage

Check return sockets as well as draining and expansion. Also check for leaks from element. Leakage from here can be difficult to detect and the damage can be significant if the leak is not detected at an early stage.

- Control of elements

The condition of the heating elements is checked by resistance measurement / megging. Possibly defective element(s) must be replaced to avoid errors in the effect groups.

- Contactors / relays

Check the contact set on the contactors and that these make/brake contact. Possible noise from the contactors may indicate wear and should be checked carefully or replaced. Worn contactors can burn fixed and cause great damage.

- Electrical connections

All connections on busbars, power switches, contactors and elements are tightened with correct torque.

- Regulator

Controller is function tested and power groups are checked.

- Safety thermostat

The safety thermostat is checked. By stopping the pump or closing the valves, you will quickly reach the trigger temperature to test if the safety thermostat trips.

REPAIR AND MAINTENANCE MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL


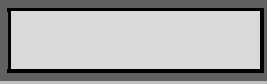
Varmeteknikk AS can be helpful with and spare parts.

Tightening torques:

Parts	Screw dimension	Tightening torques
Contaktor AF09 – AF16	M3,5	1,2 Nm
Contaktor AF26 – AF30	M4	2,5 Nm
Contaktor AF40, AF52, AF65	M6	4 Nm
Contaktor AF80, AF96	M8	6 Nm
Contaktor AF116, AF 140	M8	8 Nm
Power switch MS132 10-16	M3,5	1,5 Nm
Power switch MS132 20-32	M3,5	2,0 Nm
Power switch XT1N	M 6	6 Nm
Element connections	M4	1,2 Nm
Clampdisc for element	M12	12-15 Nm
Conductors to copper bars	M6	10 Nm

Troubleshooting

NB! TROUBLESHOOTING AND REPAIRS MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL

ERROR	DISPLAY SHOWING	CAUSE	CHECK / CORRECTION
Boiler «dead»		The boiler lacks of control voltage	The boiler requires its own control voltage
		Fuse/s for control voltage broken	Check fuses and replace if required
No power	Temp 30.0 (80)°C StepS 0 (0)	External start signal missing	Check external signal
	Temp 30.0 (80)°C StepE 0 (0)	External signal for power control missing	Check external signal
	TempE 30.0 (20)°C Power 0kW	External signal for temperature control missing	Check external signal
	Temp 0.0 (80)°C Error Temp	Defect temp. sensor	Change temp. sensor
Boiler stops at Step 3 (Alarm diode is flashing)	Temp 30.0 (80)°C Alarm Power	Safety temp. limiter has tripped	Reset Safety temp. limiter (STB) on front panel
	Temp 30.0 (80)°C Alarm Power	Main switch off or broken fuses	Check switch board/fuses Replace if required
Little heat from boiler	Temp 75,5(80)°C Step 3(5)	Maximum power limited from outside	Check external signals from a central monitoring system
	TempU 30.0 (60)°C Power 120kW	Check if boiler is limited from outdoor compensator	Check curves for outdoor copmpensation
		Defect heating elements, fuses, contactors	Check heating elements, fuses contactors and replace if required
STB – safety temp. limiter released (Display shows "Alarm Power")	Temp 30.0 (50)°C Alarm Power	Circulation in boiler	Check pump/valves
		Burnes contactor	Check contactors and replace if required
Leakage		Loose screws for heating element	Tighten screws
		Gasket for heating element	Replace if required
		Defect heating element	Replace if required

Technical data for 230V boilers

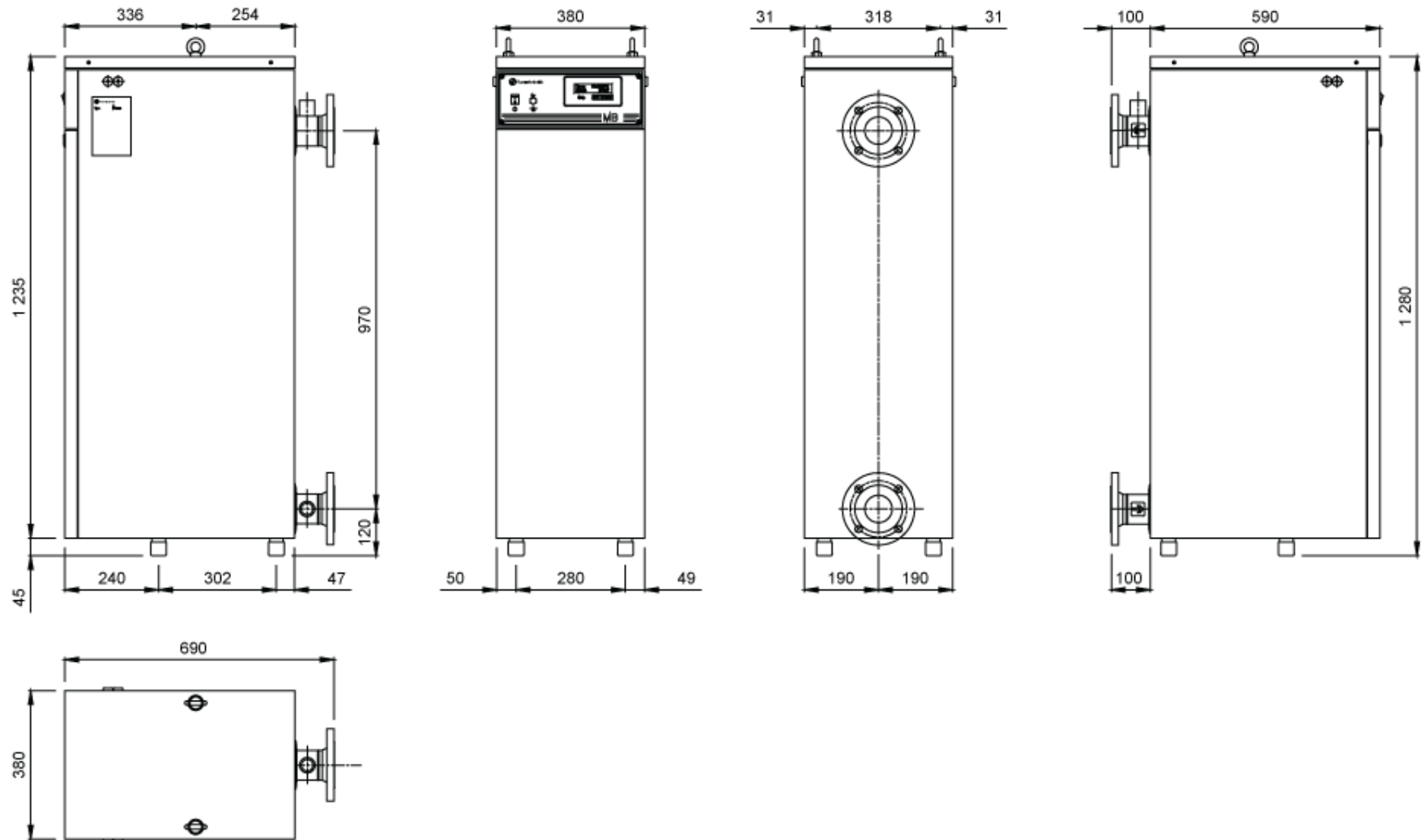
Model	kW	Amp	Power steps	Connection flange	Connection exp./drain.	Water volume liter	Q ($\Delta t=20^{\circ}\text{C}$) m ³ /h	v m/s	dP mm Vs	Weight kg
MB 2035	35	75	5, 10, 15, 20, 25, 30, 35	DN 65/16	1"	75	1,5	0,11	2	128
MB 2045	45	113	5, 15, 20, 25, 30, 40, 45	DN 65/16	1"	75	1,9	0,14	3	131
MB 2060	60	151	10, 15, 25, 35, 45, 50, 60	DN 65/16	1"	75	2,6	0,19	5	136
MB 2075	75	188	10, 20, 30, 45, 55, 65, 75	DN 65/16	1"	75	3,2	0,23	7	138
MB 2090	90	226	15, 25 40, 50, 65, 75, 90	DN 65/16	1"	75	3,9	0,28	10	144
MB 2105	105	264	15, 30, 45, 60, 75, 90, 105	DN 65/16	1"	75	4,5	0,33	14	145
MB 2120	120	301	15, 37.5, 52.5, 67.5, 82.5, 105, 120	DN 65/16	1"	75	5,2	0,37	18	150
MB 2140	140	351	20, 40, 60, 80, 100, 120, 140	DN 65/16	1"	75	6,0	0,43	24	150
MB 2150	150	377	20, 40, 60, 90, 110, 130, 150	DN 65/16	1"	75	6,5	0,47	28	155

Technical data for 400V boilers

Model	kW	Amp	Power steps	Connection flange	Connection exp./drain.	Water volume liter	Q ($\Delta t=20^{\circ}\text{C}$) m ³ /h	v m/s	dP mm Vs	Weight kg
MB 4035	35	51	5, 10, 15, 20, 25, 30, 35	DN 65/16	1"	75	1,5	0,11	2	128
MB 4045	45	65	5, 15, 20, 25, 30, 40, 45	DN 65/16	1"	75	1,9	0,14	3	131
MB 4060	60	87	10, 15, 25, 35, 45, 50, 60	DN 65/16	1"	75	2,6	0,19	5	136
MB 4075	75	108	10, 20, 30, 45, 55, 65, 75	DN 65/16	1"	75	3,2	0,23	7	138
MB 4090	90	130	15, 25 40, 50, 65, 75, 90	DN 65/16	1"	75	3,9	0,28	10	144
MB 4105	105	152	15, 30, 45, 60, 75, 90, 105	DN 65/16	1"	75	4,5	0,33	14	145
MB 4120	120	173	15, 37.5, 52.5, 67.5, 82.5, 105, 120	DN 65/16	1"	75	5,2	0,37	18	150
MB 4140	140	202	20, 40, 60, 80, 100, 120, 140	DN 65/16	1"	75	6,0	0,43	24	150
MB 4150	150	217	20, 40, 60, 90, 110, 130, 150	DN 65/16	1"	75	6,5	0,47	28	155

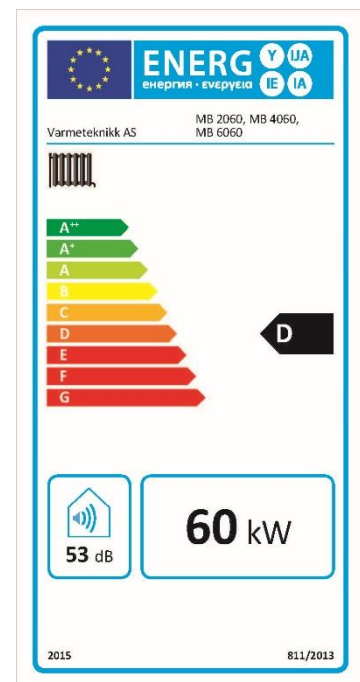
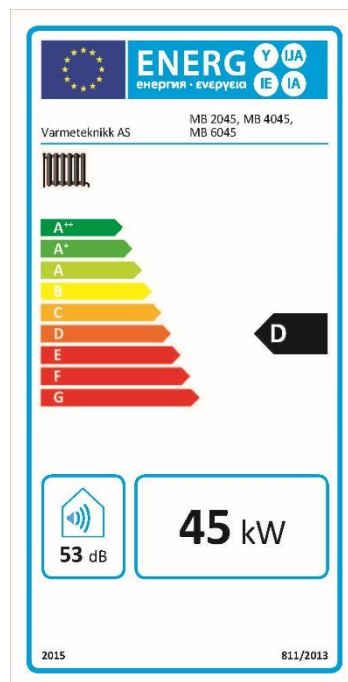
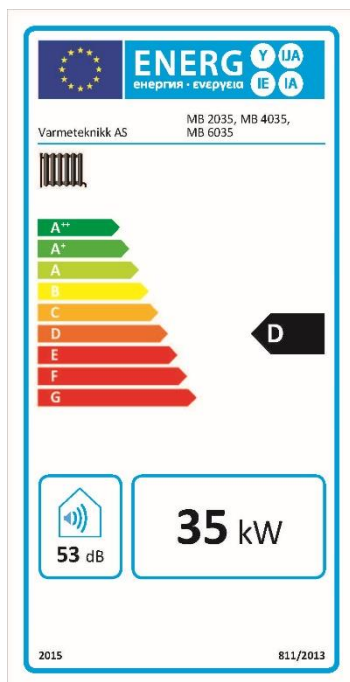
Dimensions

(All dimensions in mm.)

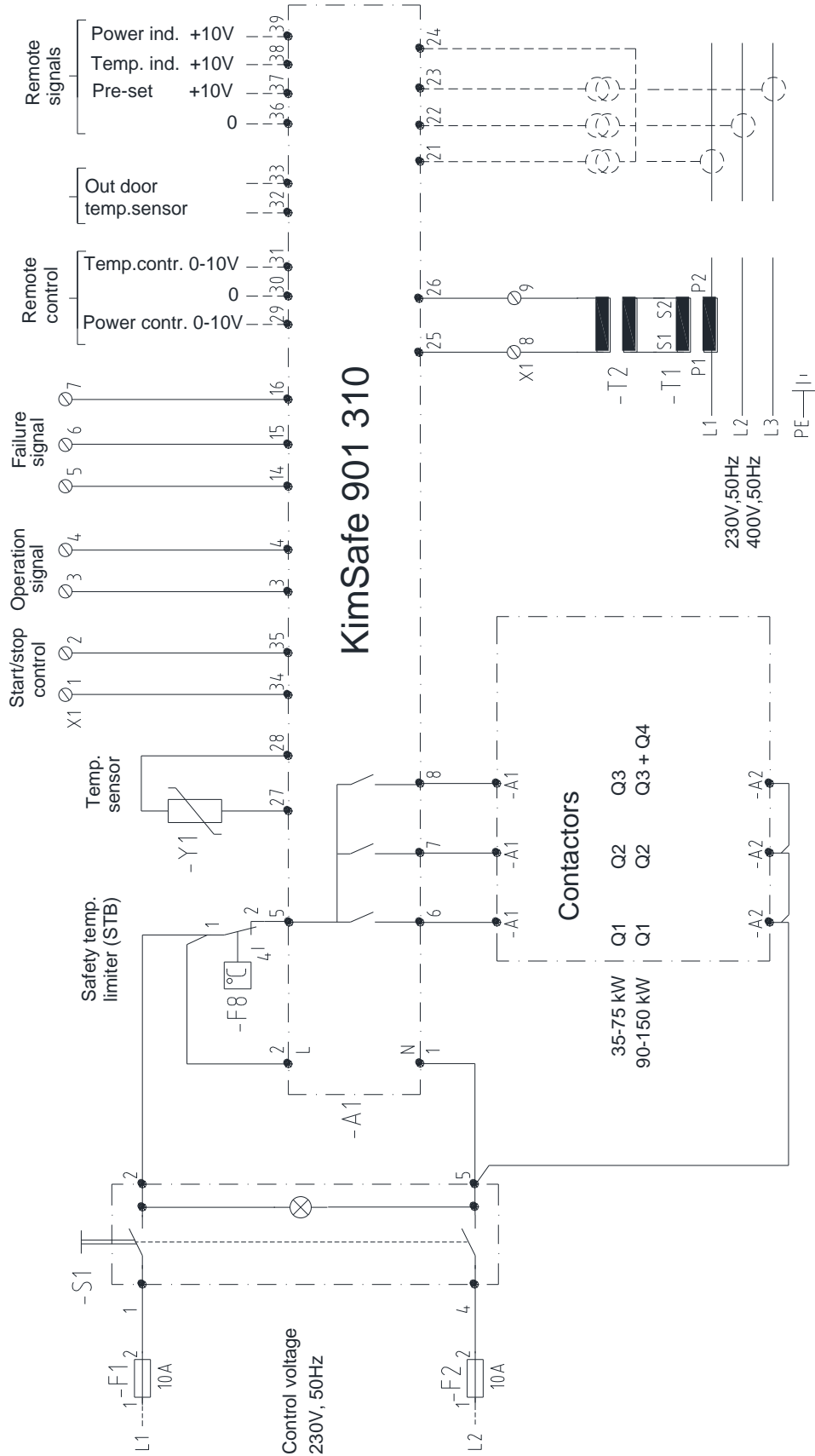


Data for energy labeling

Type	Varmeteknikk	Varmeteknikk	Varmeteknikk
Model	MB 35	MB 45	MB 60
Energy class	D	D	D
Nominal heating power P_{rated}	35	45	60
Season heating efficiency η_s	37	37	37
Energy consumption/year in kWh			
Noise level dB	53	53	53



Main circuit MB 35 – 150 kW 230 V/400 V

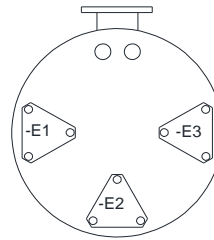
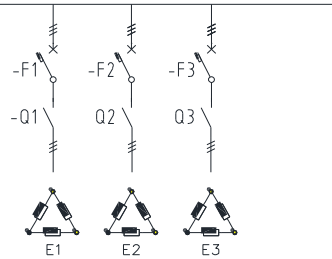


Main circuit MB 230 V

MB 35kW


230V 

Switch gir plate

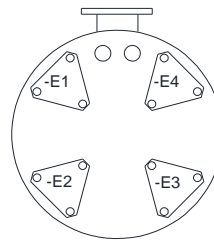
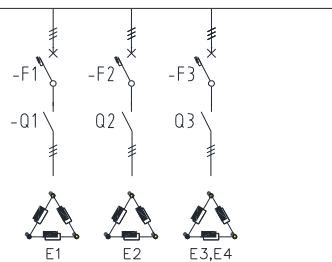


kW	35
E1	5
E2	10
E3	20

MB 45kW/60kW/75kW


230V 

Switch gir plate

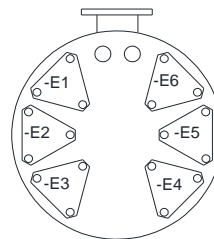
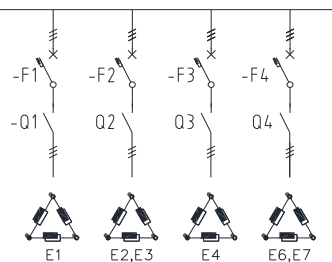


kW	45	60	75
E1	5	10	10
E2	15	15	20
E3	15	15	22,5
E4	10	20	22,5

MB 90/105/120kW

230V 

Switch gir plate

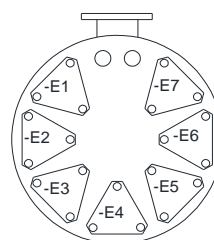
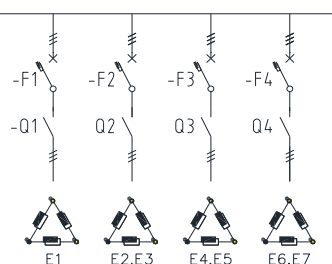


kW	90	105	120
E1	15	15	15
E2	15	15	15
E3	10	15	22,5
E4	20	20	22,5
E5	15	20	22,5
E6	15	20	22,5

MB 140/150kW

230V 

Switch gir plate



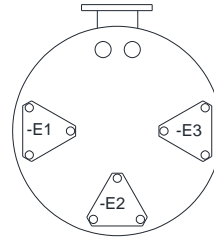
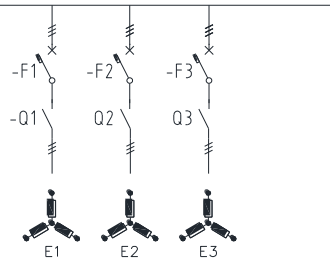
kW	140	150
E1	20	20
E2	20	20
E3	20	20
E4	20	22,5
E5	20	22,5
E6	20	22,5
E7	20	22,5

Main circuit MB 400 V

MB 35kW

400V 

Switch gir plate

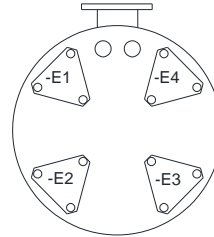
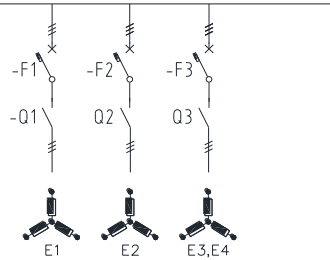


kW	35
E1	5
E2	10
E3	20

MB 45kW/60kW/75kW

400V 

Switch gir plate

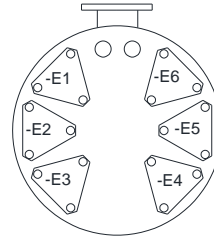
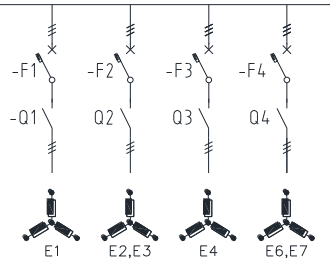


kW	45	60	75
E1	5	10	10
E2	15	15	20
E3	15	15	22,5
E4	10	20	22,5

MB 90/105/120kW

400V 

Switch gir plate

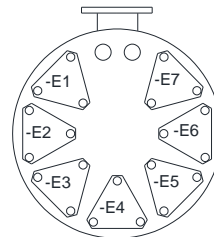
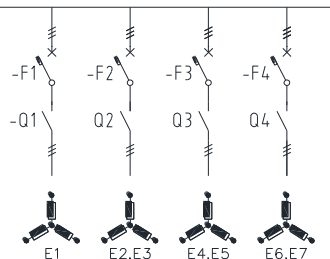


kW	90	105	120
E1	15	15	15
E2	15	15	15
E3	10	15	22,5
E4	20	20	22,5
E5	15	20	22,5
E6	15	20	22,5

MB 140/150kW

400V 

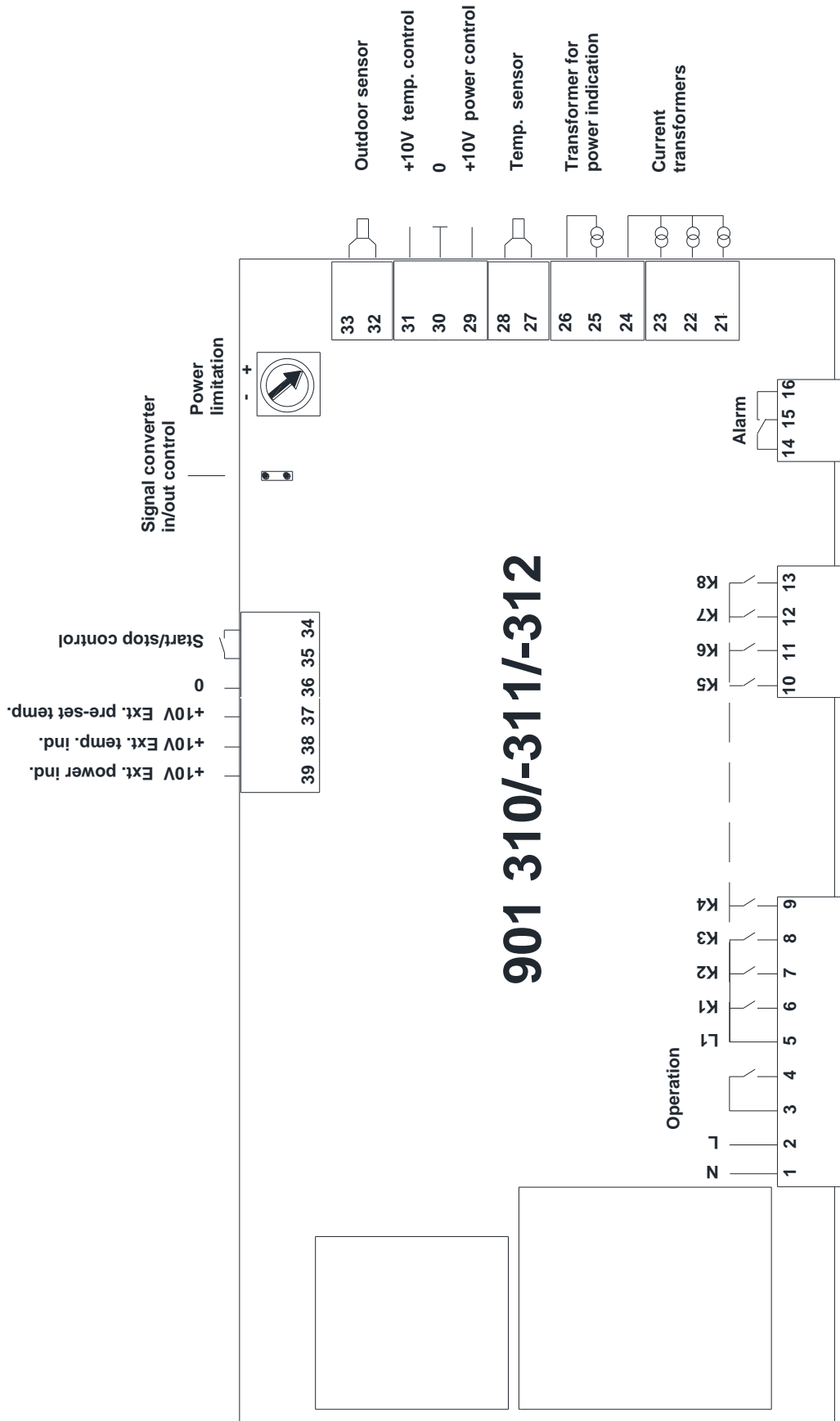
Switch gir plate



kW	140	150
E1	20	20
E2	20	20
E3	20	20
E4	20	22,5
E5	20	22,5
E6	20	22,5
E7	20	22,5

Connections to regulator

KimSafe elektronisk temp.controller



Power factors for regulator

Boiler type	Transformer (5A)	Power factor
MB 2035	100	8
MB 2045	200	16
MB 2060	200	16
MB 2075	200	16
MB 2090	300	24
MB 2105	300	24
MB 2120	400	32
MB 2140	400	32
MB 2150	400	32

Boiler type	Transformer (5A)	Power factor
MB 4035	100	14
MB 4045	100	14
MB 4060	100	14
MB 4075	200	28
MB 4090	200	28
MB 4105	200	28
MB 4120	200	28
MB 4140	200	28
MB 4150	300	42

Sensor resistance

Boiler sensor NTC22k

°C	0	10	20	30	40	50	60	70	80	90	100	110
kΩ	66,3	41,8	27,1	18	12,2	8,5	6	4,2	3,13	2,32	1,75	1,33

Outdoor sensor

°C	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25
Ω	1880	1443	1115	870	680	540	430	340	276	225	180	151

Spare parts for MB 35 – 150 kW

Gjenstand	Artikkel nr.	Antall pr. kjele																	
		35 kW		45 kW		60 kW		75 kW		90 kW		105 kW		120 kW		140 kW		150 kW	
Heating element 5 kW/230 V	6613 0001-K	1		1															
Heating element 10 kW/230 V	6672 0242-A	1		1		1		1		1									
Heating element 15 kW/230 V	6672 0242-D			2		2				4		3		2					
Heating element 20 kW/230 V	6672 0242-G	1				1		1		1		3				7		3	
Heating element 22,5 kW/230 V	6672 0242-Q							2						4				4	
Element gasket	2152 0022-4	3		4		4		4		6		6		6		7		7	
Temp.controller 7-steps	901 310	1		1		1		1		1		1		1		1		1	
Sensor for temp.controller	200 232	1		1		1		1		1		1		1		1		1	
On-/Off-switch	6672 0235-3	1		1		1		1		1		1		1		1		1	
Safety temp. limiter	6672 0235-1	1		1		1		1		1		1		1		1		1	
		230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V	230 V	400 V
Contactora AF09	41 175 00		1		1														
Contactora AF12	41 175 16																		
Contactora AF16	41 175 32	1	1	1		1		1											
Contactora AF26	41 175 48	1	1		2	1	1	1	1		2		2		2		1		1
Contactora AF30	41 175 56			1		1				1	1	1		1					
Contactora AF40	41 175 75	1		1		1		1		1	1	1	1	1	1	1		1	
Contactora AF52	41 175 80							1		2		1	1	1	1		3		3
Contactora AF65	41 175 86																		
Contactora AF80	41 175 92					1													
Contactora AF116	41 176 10											1		1		3		1	
Contactora AF140	41 177 79							1						1				2	
Fuse 10 A	6672 0235-27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Switch MS132/10	43 640 79		1		1														
Switch MS132/16	43 640 80	1		1															
Switch MS132/20	43 640 81		1					1		1									
Switch MS132/32	43 640 83	1			1	1	1	1			1		1		1				
Switch XT1N-40	067 412		1							1		1		1		1		1	
Switch XT1N-50	067 413			1	1	1				1	1	1		1					
Switch XT1N-63	067 414	1				1		1		1	1	1	1	1		1		1	
Switch XT1N-80	067 415			1						1	1		1	1	2		3		3
Switch XT1N-100	067 416									1		1							
Switch XT1N-125	067 417					1						1		1		3		1	
Switch XT1N-160	067 418							1						1				2	
Sec transformer	200 018	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Power transformer 100/5 A	6672 0235-50	1	1		1		1												
Power transformer 200/5 A	6672 0235-51			1		1		1	1		1		1		1		1		
Power transformer 300/5 A	6672 0235-53									1		1							1
Power transformer 400/5 A	6672 0235-54													1		1		1	

SAMSVARSERKLÆRING

Declaration of conformity

Fabrikant/Manufacturer

Navn/Name:	Varmeteknikk AS		
Adresse/Address:	Postboks 6 Alnabru 0614 Oslo		
Telefon/Phone:	+47 23 37 55 00	Telefax:	+47 23 37 55 10

erklærer herved at produktet er i overensstemmelse/
 declare under our sole responsibility the conformity of the product:

Produkt/Product

Produkt/Type of equipment:	Elektrokjøl/ Electric boiler
Fabrikat/Brand name:	Varmeteknikk
Modell/Type:	MB 35 - 150kW

Med de grunnleggende krav i direktivene/ With the essential requirements of the directives:	
2014/35/EU	Lavspenningsdirektivet (LVD)
2014/35/EU	Low Voltage Directive (LVD)
2014/30/EU	Elektromagnetisk kompatibilitet (EMC)
2014/30/EU	Electromagnetic Compatibility (EMC)
2009/125/EU	Energirelaterte produkter
2009/125/EU	Energy related products/ErP)

Harmoniserte standarder/Harmonized standards

	Nr./No
HOUS	EN 60335-1:2012; A11: 2014 EN 60335-1:2012 EN 60335-2-35:2002, A1; A2
EMF	EN 62233:2008
EMC	EN 61000-6-2:2005 EN 61000-6-3:2007, A1
ERP	(2014/C 207/02) OJ 3.7.2014

Teknisk kontrollorgan/Notified body

Navn/Name:	Nemko AS
Adresse/Address:	Postboks 73 Blindern, 0314 Oslo
Sertifikat nr./Certificate no:	P14218532/A1

Dato/Date: 01.08.2020

Sted/Place: Oslo



Stig Bø
Teknisk sjef/Technical Director

Notes:



Varmeteknikk AS

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