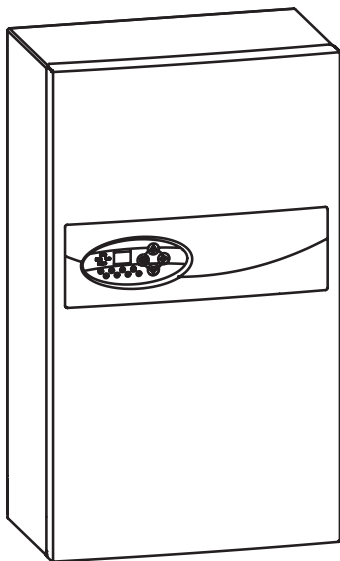


ELECTRIC CENTRAL HEATING FLOW BOILER



EKCO.LN2
EKCO.LN2...p
EKCO.L2
EKCO.L2...p



Used product can't be treated as general communal waste. Disassembled appliance has to be delivered to the collection point of electrical and electronic equipment for recycling. Appropriate utilisation of used product prevents potential negative environmental influences that may occur as a result of inappropriate handling of waste. In order to get more detailed information about recycling this product you should contact the local government unit, waste management service or the shop where this product has been purchased.

Safety instructions

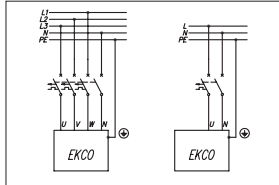
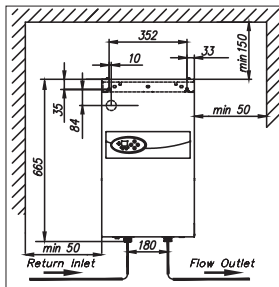
1. Read and strictly follow the installation and operating instructions to ensure a long life and reliable boiler operation.
2. An efficient electrical installation which has been completed in accordance with the binding norms of electric installation.
3. A wet central heating system equipped with appropriate expansion vessel made according to binding norms of hydraulic installation.
4. A wet central heating system must be flushed before boiler installation.
5. Do not install any barrier fittings (e.g. valves) on the outlet of the safety valve.
6. Boiler must be installed on an even wall surface.
7. Boiler must not be installed in a humid place or in a place exposed to the danger of explosion.
8. Boiler installation and all electrical and hydraulic work must be performed by a qualified professional installer.
9. All installation work must be performed when the power and water supply is turned off.
10. EKCO.LN2 and EKCO.LN2...p model is equipped with a differential pressure relief valve (bypass). It allows the system to keep minimal flow of heating medium through the boiler and reduce noises in installation during the thermostatic valves closing.
11. Electric installation should be equipped with residual current protective devices and other solutions which will ensure disconnecting the heater from the source of power (intervals between all their poles should not be less than 3 mm).
12. Boiler is pre-set by the manufacturer to work with the central heating system. Change the factory settings („Extended Menu”) to boiler work with DHW Cylinder.
13. Do not drain the water from central heating system after the heating season.
14. Leave the controller in stand-by mode and do not cut off power supply between the heating seasons.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

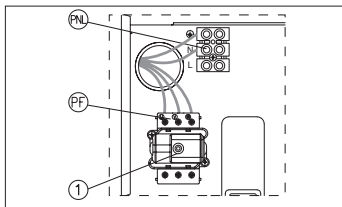
Installation

1. Hang the boiler up in a vertical position on fixing screws with the inlet and outlet pipes to the bottom, maintaining clearances from the walls and the ceiling.
2. Connect the boiler to the central heating system equipped with a cut-off valves.
3. Fill the central heating system with a treated water that substantially extends the life of the heating elements.
4. Vent the central heating system.
5. Connect a boiler to the electrical system.
6. Fix the room thermostat, in accordance with manual instruction.
7. Connect the room thermostat (by using two wires $2 \times 0,35 \text{ mm}^2$) to the terminal of control panel (RP entry).
8. Once you have finished the above procedures, you can start the boiler. See the „Start-up” section.



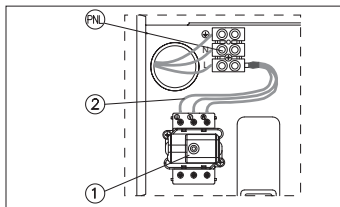
While applying thermostat make sure there is no voltage on its entry!

Do not connect any voltage into RP, NA, WZ entries! This can result in permanent controller damage.



Connection to the three-phase electrical system.

- PNL - points of neutral and protective conductor connection
- PF - points of phase conductors connection
- [1] - temperature limiter



Connection to the single phase electrical system
(for boilers of 4kW, 6kW and 8kW)

- PNL - connection points of neutral, protective and phase conductors
- [1] - temperature limiter
- [2] - additional conductors (for single phase system only)

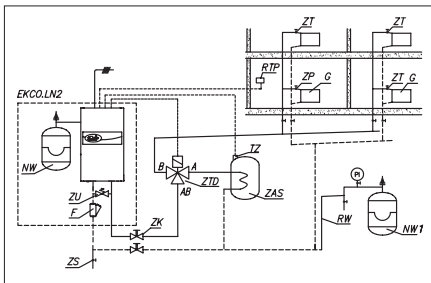
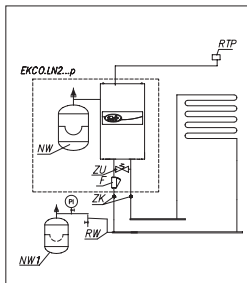
Important: 4, 6 and 8kW boilers are factory preset to work as single phase boilers. If you intend to connect the boiler to a three-phase system, take off the [2] wire set.

EKCO.LN2 and EKCO.LN2...p model are equipped with an expansion vessel (capacity: 6l, pressure: 1,5 bar). The expansion vessel is sufficient for following capacities of the heating system at given temperatures of the medium and central heating system pressure.

Temperature of heating medium (feed and return)	Capacity of central heating system	Pressure in central heating system
[°C]	[l]	[bar]
85/70	58	1,5
70/55	79	
55/45	103	
50/40	115	
45/35	128	

Shall the capacity of the wet central heating installation be larger, an extra expansion vessel should be installed on it.

Boiler connection to the central heating system

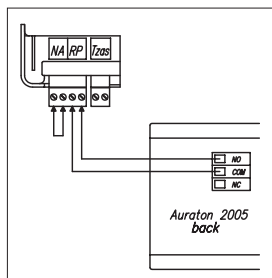


- PI - manometer
- ZK - cut-off valve
- RW - expansion pipe
- NW - built-in expansion vessel (EKCO.LN2 and EKCO.LN2..p model)
- ZT - thermostatic valve
- ZP - passage valve

- ZU - differential pressure relief valve - bypass (EKCO.LN2 and EKCO.LN2..p model)
- F - magnetic filter
- G - radiator
- RTP - room programmed thermostat
- ZS - drain valve
- ZTD - three-way valve
- ZAS - DHW Cylinder
- TZ - WE-019/01 sensor or cylinder thermostat

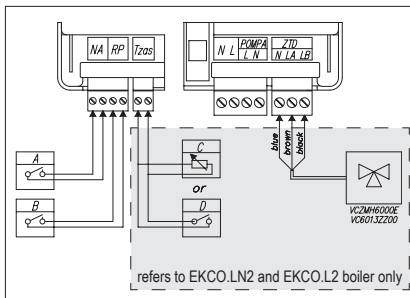
Connection of external appliances

- ZTD - connection point of three-way valve
- Tzas - connection point of water temp. sensor (in cylinder or cylinder thermostat)
- A - master appliance
- B - room thermostate Auraton 2005
- C - 019/01 KOSPEL - water temp. sensor (in cylinder)
- D - cylinder thermostat
- RP - room thermostat connection point
- NA - master appliance connection point



Room thermostat (RP entry) – when the voltage free contact gets opened the boiler will stop heating. The entry is responsible for boiler control depending on the room temperature. (room thermostat connection details – page 4, sub clause 7).

WE-019/01 Cylinder water temperature sensor (Tzas entry-refers to EKCO.LN2 and EKCO.L2 model) – for connection details please, refer to the figure. If it is necessary, you can extend the wires, however,



please remember that the shorter the wires the better. If the wire is too long there may occur disturbances and it may not work properly. The wires should not run close to mains cables, they must not go around other electric wires.

Important. To activate the sensor and DHW cylinder heating, please follow the instructions in section „ADVANCED SETTINGS”. Set up the temperature of heating medium (50 - 85°C) and select „ti” as a way of temperature measurement in cylinder.






DHW Cylinder thermostat (Tzas entry-refers to EKCO.LN2 and EKCO.L2 model) –

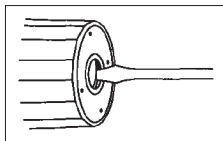
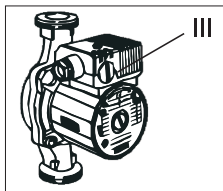
Kospel suggests to use the VCZMH6000E valve with the VC6013ZZ00 servo-motor. The three-way valve control is performed by applying 230V on the brown wire or the black wire (blue is the neutral wire). Voltage on the valve through the brown wire will switch the valve to a position, where the pass between the „AB” inlet and the „B” outlet gets opened.

Shall voltage be passed to the black wire, the valve will get switched to the position in which the channel between the „AB” inlet and the „A” outlet will be opened. The „AB” inlet and the „A” and „B” outlets are marked on the valve An entry „B” is to supply the central heating system and the entry „A” is to supply the cylinder. Important. To activate the cylinder heating please follow the instructions in the „ADVANCED SETTINGS” section. Set up the temperature of heating medium (50 - 85°C).

Master appliance (NA entry) – you can limit the power used, i.e. the boiler can be switched off while another appliance consumes electricity. To do it, an electrician should install in line an extra open contact to the NA entry (voltage free entry), so that when a master appliance gets on, the contact will be opened the boiler switched off. When the NA contact gets opened, heating will get off and the pump stopped. The EKCO.LN2 and EKCO.L2 model may also work as second boiler. If it is so, the master boiler by opening the NA entry will stop heating of EKCO. However, the mode of the three-way valve control stays on so a DHW cylinder is charged by the heat from the master boiler.

Start up




1. Disconnect the room thermostat from the boiler or disconnect the NA contacts.
2. Check out if the appropriate installation pressure is reached (see the „TECHNICAL DATA” section). In order to check it use  or  button when the panel control is „on”. The „A” indicator flickers (see „Operating” section) when the installation pressure is too low. It doesn't concern the open installation.
3. Set the pump at manual mode (see the „Advanced settings” section).
4. Switch the boiler on (press  button).
5. Check out if the appropriate medium flow rate is reached (the „H” indicator is on with a constant light). The pump should get vented itself after a short working time, however, if necessary, vent the pump in the following way:
 - close the cut-off valve on the outlet,
 - set the pump on the highest gear,
 - undo carefully the vent plug,
 - after 15-30 s. do the vent plug up,
 - open the cut off valve.
6. Switch the boiler off (press and hold  button for 3 seconds).
7. Set the pump at automatic mode (see the „Advanced settings” section).
8. Connect the programmed room thermostat or connect the NA contacts.
9. Switch the boiler off (press  button).
10. Set the temperature of the medium at required temperature (see the „Operating” section).



Special start-up procedure (when the system is filled with an antifreeze solution)


A flow rate reading error may occur if you start-up the unit at low ambient temperature. This error may occur because the physical properties of antifreeze solution. If the H indicator flickers and the cut-off valves are opened you have to close NA and RP contacts which will automatically start the special start-up procedure. As a result, the medium will be warmed up to temperature that enable you to read the flow rate correctly. The duration of procedure depends on both the installation capacity and the temperature inside the installation. When a control panel display shows selected parameters alternately and marks („-“, „-“) it means that the procedure is started. The procedure will close automatically and the unit will start normal operation once the minimal flow rate is reached.

Advanced settings

For advanced settings switch the control panel to standby mode (press and hold  button for 3 seconds) then press and hold the , button, and press .

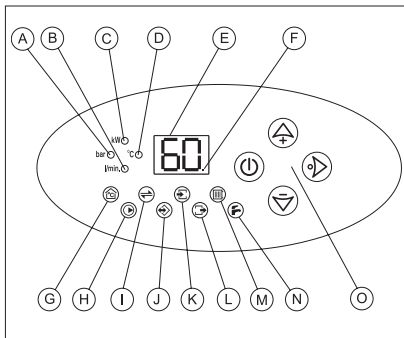
To select parameter press ,  or  buttons enable you to change the value:

- boiler power - enter the power amount (kW) as indicated on identification label,
- working mode of pump – PA (automatic), Pr (manual – continuous duty of pump),
- max. quantity of active heating elements,
- Operating characteristic of boiler:
 - (no) temperature control between 20 – 85°C,
 - (Po) temperature control between 20 – 60°C (DHW settings are not available),
- temperature of medium in cylinder (switch on the DHW cylinder mode) – to start this mode, set the medium temp. between 50 – 85°C, if you set temp. at 0°C it will switch off DHW cylinder mode,
- temperature in cylinder measurement method,
 - ti (internal) – water temp. in cylinder is measured by the WE-019/01 temp. sensor,
 - Te (external) – external thermostat, the close/open contact is connected to Tzas entry. If the DHW cylinder mode is inactive this parameter is unavailable,
- installation pressure sensor – active (1) or inactive (0), in the open installation the sensor must be inactivated,
- number of boiler in cascade connection, setup at 0 enables independent boiler operation, the boiler is not recognised by superior sensor,
- type of flow sensor – (1) HC DN 15 sensor, (2) KOSPEL sensor,
- work-time counter of boiler (read-only time). Counter display shows figures (without leading zeros) starting from the most important with 1/2 second intervals, the display will turn off (for 2 seconds) when the least important figure is shown,

Press and hold the  button to exit and save the settings.


Control panel

- A - pressure [bar]
- B - flow [l/min]
- C - power [kW]
- D - temperature [0° C]
- E - digital display
- F - indicator of medium temperature setting (for DHW cylinder)
- G - indicator of room thermostat and heating activity (for central heating)
- H - indicator of pump and flow activity
- I, J - inactive indicators
- K - inlet temp. indicator
- L - outlet temp. indicator
- M - indicator of boiler activity (for central heating)
- N - indicator of boiler activity (for DHW cylinder)
- O - control buttons







The control panel consists of two working areas: the signalling area (elements: A-N) and control area (O). The user can select the following working modes:



- stand-by, winter (CH heating or CH + DHW heating), summer (DHW heating) for EKCO.LN2 and EKCO.L2,
- stand-by, winter (CH heating) for EKCO.LN2...p and EKCO.L2...p.

To switch between working modes press .




Stand-by mode

To set the stand-by mode press  and hold for 3 seconds. Important: Do not cut power supply off between heating season. When the control panel is switched to „Stand-by” mode the control panel is off (the F icons flickers only). In this mode the boiler is off but the pump is activated every day for 15 minutes (what protects the boiler and the whole central heating installation from being blocked and silted up). The pump will run every day at the same time, it will be the time of the day when you switch it to the „Stand-by” mode e.g., if you set the pump on a „Stand-by” mode at 6 p.m. the timer will activate the pump everyday for 15 minutes starting at around 6 p.m. To check out the installation pressure press  or  To set the winter mode press  (when you set from „Stand-by” to „Winter mode”).

Winter mode (CH)

When the control panel is switched to „Winter mode” the  icon is on. In this time the control panel is in the main view display, the icons show current working mode of boiler. The digital display shows the temperature of medium (for central heating). You can check out the following working parameters by pressing the  button. A display shows (in sequence): CH medium temp. setting (D and M indicators are on), inlet temp. (D and K indicators are on), outlet temp. (D and L indicators are on), medium



flow rate through the boiler (B indicator is on), installation pressure (A indicator is on), power with which the boiler currently heats (C indicator is on).











To set the temp. of medium press  or  (when you are in medium temp. setting view). The temp. can be set between 20 – 85°C. A controller will switch over to the main view, if you don't use a buttons for 1 min. To automatically switch to the main view press  (when you are in the medium temp. setting view).

To ensure smooth and economic boiler operation, the temperature of the medium (for central heating) has to be set in accordance with current weather conditions (outdoor temperature), taking into account the building parameters (e.g. compactness, insulation, windowing etc.). Optimum settings of the medium temperature can reduce the boiler operating costs.




Winter mode (CH + DHW) - EKCO.LN2 and EKCO.L2 only.

In this mode the three-way valve directs the medium to either central heating installation or cylinder coil. The priority is to heat the DWH cylinder, at the same time the central heating system is off.


When  and  icons are on it shows that the boiler is in C.H + DHW mode. When you switch to this mode the control panel is in the main view display, an icons show current working mode. The digital display shows the temperature of medium.




You can read and set the following working parameters by pressing the  button. A display shows (in sequence): CH medium temp. setting (D and M indicators are on), DHW temp. reading and setting (D and N indicators are on) or an exterior thermostat status (N indicator is on), inlet temp. (D and K indicators are on), outlet temp. (D and L indicators are on), medium flow rate through the boiler (B indicator is on), pressure in the system (A indicator is on), power with which the boiler currently heats (C indicator is on). A water temp. in cylinder is shown only if the WE-019/01 temp. sensor is applied to the Tzas entry. To set the temp. of DHW press  or  button (when you are in cylinder temp. setting view). The temp. can be set between 30 – 80°C (D,N,F indicators are on). If you set temp. at 0°C it will switch off the DHW cylinder heating ( indicator flickers). When an external thermostat is applied (instead of temp. sensor) the contact status will be shown (instead of water temp.): 0 – open contact, 1- close contact. The close-open contact of thermostat has to be connected to the Tzas entry (see figure on page 6). A boiler heats the cylinder when the Tzas entry is closed. You can activate or deactivate cylinder heating mode by pressing  or  button when you read the thermostat contact status, 0- DHW mode is deactivated, 1 – DHW mode is activated. The  icon flickers when you deactivate cylinder heating mode. To set the temp. of medium press  or  (when you are in medium temp. setting view). The temp. can be set between 20 – 85°C. A controller will switch over to the main view, if you don't use a buttons for 1 min. To automatically switch to the main view press  (when you are in medium temp. setting view).

To ensure smooth and economic boiler operation, the temperature of the medium (for central heating) has to be set in accordance with current weather conditions (outdoor temperature), taking into account the building parameters (e.g. compactness, insulation, windowing etc.). Optimum settings of the medium temperature can reduce the boiler operating costs.




Summer mode - EKCO.LN2 and EKCO.L2 only. To switch to summer mode press  (when you are in main view of winter mode). This mode is available only if the boiler is enabled to co-operate with the DHW cylinder. A heating medium is directed to cylinder's coil. When  icon is on and  icon is off it shows that the boiler operates in summer mode.


When you switch to this mode the control panel is in the main view, an icons show current working mode. The digital display shows the temperature of medium.


You can read and set the following working parameters by pressing the  button. A display shows (in sequence): DHW temp. reading and setting (D and N indicators are on) or an exterior thermostat status (N indicator is on), inlet temp. (D and K indicators are on), outlet temp. (D and L indicators are on), medium flow rate through the boiler (B indicator is on), pressure in the system (A indicator is on), power with which the boiler currently heats (C indicator is on).

A water temp. in cylinder is shown only if the WE-019/01 temp. sensor is applied to the Tzas entry (see figure on page 6). To set the temp. of DHW press  or  (when you are in cylinder temp. setting view). The temp. can be set between 30 – 80°C (D,N,F indicators are on). If you set temp. at 0°C it will switch off the cylinder heating ( indicator flickers).

When an external thermostat is applied (instead of temp. sensor) the contact status will be shown (instead of water temp.): 0 – open contact, 1- close contact. The close-open contact of thermostat has to be connected to the Tzas entry (see figure on page 6). A boiler heats the cylinder when the Tzas entry is closed.

You can activate or deactivate cylinder heating mode by pressing  or  button when you read the thermostat contact status, 0- cylinder heating mode is deactivated, 1 – cylinder heating mode is activated. The  icon flickers when you deactivate cylinder heating mode.

A controller will switch over to the main view, if you don't use a buttons for 1 min. To automatically switch to the main view press  (when you are in medium temp. setting view).

To switch to winter mode press  button shortly (when you are in the main view of summer mode).

Icons and indicators

MODEL	INDICATOR	STATUS	DETAILS
all models		on	room thermostat allows the boiler to heat
		off	the required temperature has been reached (boiler doesn't heat),
		flickers	master appliance doesn't allow to heat (NA entry is open),
		on	pump is active, a proper flow rate of medium has been reached
		flickers	lack of flow or insufficient flow rate of medium (failure condition), a heating elements are off,
	EKCO.LN2/ EKCO.L2		red
			proper temp. has been reached (CH)
green			boiler heats the DHW (icon is on)
			temp. in CH system is lower than required but the required room temperature has been reached, RP entry is open, or room thermostat is blocked,
all models		off	boiler operates in summer mode
EKCO.LN2/ EKCO.L2		red	boiler heats (DHW)
		green	boiler heats (DHW), the required temp. of water
		flickering (green)	DHW heating is blocked
all models	A	flickers	installation pressure is not sufficient (below 0,5 bar), heating is blocked, pump is inactive
	E	dashes	parameter out of range or a temp. sensor failure
	K and L	flickers	relevant temperature sensor failure
	E	EE message	data record error

Failures

Symptom	Reason	Action
The indicators on control panel are off	lack of boiler power supply	check parameters of the power network and fuses
		contact an authorised service or the seller
A indicator flickers	insufficient pressure (below 0,5bar)	switch the controller to the pressure view, increase the pressure to the required level
	pressure sensor failure	switch the controller to pressure view, if the display shows „-“ contact an authorised service
H indicator flickers	pump is blocked	unblock the pump - unscrew the screw on pump housing and move the pump rotor manually
	a medium doesn't circulate through the boiler – boiler is blocked	an air-bound central heating system, vent the installation, pump and boiler
		check patency of central heating system clean the filter
	a failure of pump's power supply	contact an authorised service or the seller
G indicator is off (in winter mode)	a failure of installation that connect a room thermostat	contact an authorised service or the seller
	a failure of electronic module	contact an authorised service or the seller
K indicator flickers	a failure of inlet temp. sensor, boiler in failure condition	contact an authorised service or the seller
L indicator flickers	a failure of outlet temp. sensor, the heating is blocked	contact an authorised service or the seller
G indicator flickers, master appliance doesn't work	a failure of installation that connects the master appliance	contact an authorised service or the seller
	a failure of electronic module	contact an authorised service or the seller
EKCO.LN2 and EKCO.L2 model doesn't heat the cylinder	a failure of cylinder temp. sensor or thermostat	contact an authorised service, replace cylinder temp. sensor or thermostat
	a failure of three-way valve servo-motor	replace servo-motor
	a failure of electronic module	contact an authorised service or the seller
EE message on E display	data record error	contact an authorised service or the seller

Technical data

Max. pressure		MPa	0,3 (3 bar)
Min. pressure		MPa	0,05 (0,5 bar)
Outflowing water temp.	EKCO.LN2; EKCO.L2	°C	20 ÷ 85
	EKCO.LN2..p; EKCO.L2...p		20 ÷ 60
Max. water temp.		°C	100
Overall dimensions (height x width x depth)	EKCO.LN2; EKCO.LN2...p	mm	710 x 418 x 252
	EKCO.L2; EKCO.L2...p		710 x 418 x 153
Weight	EKCO.LN2; EKCO.LN2...p	kg	~24,5
	EKCO.L2; EKCO.L2...p		~17,2
Water connection			G 3/4" (internal thread)
Expansion vessel	EKCO.LN2; EKCO.LN2...p	l	6
Safety class			IP 22

Rated power	kW	4	6	8	4	6	8
Rated voltage		230V~			400V 3N~		
Rated current	A	17,4	26,0	34,8	3 x 5,7	3 x 8,7	3 x 11,7
Fuse rated current	A	20	32	40	10		16
Min. connecting wires section	mm ²	3x2,5	3x4	3x6	5x1,5		
Max. connecting wires section	mm ²	5 x 16					
The maximum allowed network impedance	Ω	0,27	0,17	0,15			0,27

Rated power	kW	12	15	18	21	24
Rated voltage		400V 3N~				
Rated current	A	3x17,3	3x21,7	3x26,0	3x30,3	3x34,6
Fuse rated current	A	20	25	32	40	
Min. connecting wires section	mm ²	5 x 2,5		5 x 4		5 x 6
Max. connecting wires section	mm ²	5 x 16				
The maximum allowed network impedance	Ω			0,27	0,22	0,13

Rated power	kW	4	6	8	12	4	6	8
Rated voltage		220V~				380V 3N~		
Rated current	A	18,3	27,4	36,4	54,5	3x6,1	3x9,1	3x12,2
Fuse rated current	A	25	32	40	63	10	16	
Min. connecting wires section	mm ²	3 x 2,5	3 x 4	3 x 6	3 x 10	5 x 1,5		
Max. connecting wires section	mm ²	3 x 16			3 x 25	5 x 16		
The maximum allowed network impedance	Ω	0,27	0,17	0,15				0,27

Rated power	kW	12	15	18	21	24
Rated voltage		380V 3N~				
Rated current	A	3x18,3	3x22,8	3x27,4	3x31,9	3x35,6
Fuse rated current	A	20	25	32	40	
Min. connecting wires section	mm ²	5 x 2,5		5 x 4		5 x 6
Max. connecting wires section	mm ²	5 x 16				
The maximum allowed network impedance	Ω			0,27	0,22	0,13

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