

## Technical Report

AE-BU18FL – Electric switchboard 18,5kW, 400V, 50Hz

### 1. General

AE-BU18FL is an indoor, metal sheet cabinet designed for control and powering of the blower unit and complies with EN 60204-1. The cabinet is totally enclosed and has following dimensions: 800x600x400 mm (HxWxL).

The switchboard consists of electric components, which ensure starting, running and safe operation of 18.5 kW / 400 V blower package. The switchboard is secured against short circuit by main circuit breaker – 1F1. Start and blower speed control is controlled by frequency inverter (FI) -1G1. Its protection circuits protect the blower motor from over-current. It is started by auxiliary relay -4KA1. Blower cabinet fan motors -1M5 are powered by 230 VAC, 50 Hz isolation transformer -1T4. Its primary winding is protected by fuses -1FU3.3 and -1FU3.4, motor -1M5 is protected by fuses -1FU5.1 a -1FU5.2. Start is provided by auxiliary relay -4KA4. Motor of switchboard fan –1M4 is protected by fuse -1FU4 and started by auxiliary relay -4KA2. Isolation transformer -1T6 powers the control circuit of the switchboard with 24 VAC, 50 Hz. Its primary wiring is protected by fuses -1FU3.1 and 1FU3.2, control circuits are protected by fuses -2FU1.1, -2FU1.2, -2FU1.3, -2FU1.4. Logik 26-S controller -2A4, EMERGENCY STOP button -2SA5, the -5S5 switch Man and Auto and the blower speed control trimmer -5R4 are placed on the switchboards door. The main switch -1Q1 is placed on the cabinet side wall.

The electric switchboard shall be connected to the main power supply by WL01 cable in size 4x10mm<sup>2</sup>. The blower motor should be connected by shielded cable WL02, YSLCY-JZ 4x10 mm<sup>2</sup>. Fan motor –1M5 should be connected by WL03 YSLY-JZ 3x1 cable, air temperature sensor –B1 by WS01 YSLY-OZ 2x0,75 cable, pressure sensor –B2 by WS04 YSLCY-OZ 2x0,5 cable, pressure sensor -B3 by WS05 YSLCY-OZ 2x0,5 cable, motor thermistor -6B7 by WS06 YSLY-OZ 2x0,75 cable, fan thermistor -5B5. Cables from and into the switchboard shall be installed from the bottom of the switchboard.

**ATTENTION! When working on the device, it is necessary to switch it off from the power supply by setting off the main circuit breaker. There is a voltage on input terminals even when the main switch is switched off.**

### 2. Function description

After switching on the main switch -1Q1 and the main circuit breaker –1F1, blower is ready to start. The -5S5 switch can be set to Man and Auto. Trimmer -5R5 can be set to the required RPM. Please see the Danfoss frequency inverter manual (Annex to the Technical report) to set the drive parameters. Press push START [I] button on the control unit (PLC) –2A4. The machine will start. Please note, that the Man/Auto switch is not operational when the machine is running.

It is possible to read current value of the blower discharge pressure and the air temperature on the display (PLC) –2A4. Please check the LOGIK 26-S manual to read the process values and/or set the control unit parameters.

It is possible to control the blower by remote command through NO contact via terminal connectors –X4:1, :2. The current condition of blower is reported via zero-potential contacts -X5:1 - com. conductor, -X5:2 - connected (NO) ..... operation, –X5:3 connected (NO) ..... blower without any failure.

When temperature or pressure exceeds the warning preset, the display starts signalling an ALARM, stating its type, and blower continues its operations. In case of a defect, i.e. when air temperature or discharge pressure level exceed the alarm level or when the current in the engine exceeds the preset level by 15%. PLC will disconnect the power supply and the blower will stop. It is possible to put blower into operation after the defect has been eliminated.

### 3. Basic technical parameters

Rated voltage .....	3PE AC 400/230V, 50Hz
Rated current .....	36A
Short circuit resistance .....	10kA
El. protection .....	IP54, after opening the cover IP20
Protection from dangerous touch .....	automatic disconnection from the source
Switchboard dimensions .....	800x600x400mm (1400x600x400)
Weight – switchboard + control panel .....	100kg
Design according to .....	ČSN EN 60204-1
Drawing documentation .....	AR 100 185 S

### 4. Technical specification

Metal sheet cabinet Schrack WST6080400, dimensions 600x800x400mm

Item	Marking	description,type,function,manufacturer/supplier	QTY, length (m)
1.	-2A4	PLC, Logik 26-S, LogikaControl, Italy	1
2.	-B1	Temperature sensor, MBT3270, -50/+150°C, measurement of air temp , Danfoss, outside of switchboard	1
3.	-B2	Pressure sensor, MBS3000, 0 - 250kPa/4 - 20mA, measurement of air pressure, Danfoss, outside of switchboard	1
4.	-B3	Pressure sensor, MBS3000, 0 - 250kPa/4 - 20mA, measurement of air pressure, Danfoss, outside of switchboard	1
5.	-1F1	Circuit breaker, C40/3, 40A, 400V, main circuit breaker, Schrack	1
6.	-1FU3.1,2	Fuse T2A, 500V + RSPA4, protects transf. -1T6 from short circuit, OMEGA, Elektro Bečov	2
7.	-1FU3.3,4	Fuse T6,3A, 500V + RSPA4, protects transf. -1T4 from short circuit, OMEGA, Elektro Bečov	2
8.	-1FU4	Fuse T1A, 250V + ASK2S, switchboard fan protection -1M4, OMEGA, Schrack	1
9.	-1FU5.1,2	Fuse T1A, 250V + ASK2S, blower fan protection -1M5, OMEGA, Schrack	2
10.	-2FU1.1,2	Fuse F3,15A,250V + fuse holder ASK2S , protects control circuits, OMEGA, Schrack	2
11.	-2FU1.3,4	Fuse T3,15A,250V + fuse holder ASK2S , protects control circuits, OMEGA, Schrack	2
12.	-1G1	Frequency convertor with control panel, FC302P15K, 18,5kW, 380-500V, Danfoss	1
13.	-4KA1, -4KA2, -4KA4, -4KA5	Relay, XT484R24, 24V AC, 8A + socket , auxiliary relay for control circuits, Schrack	4
14.	-1KM1	Contact, LZDC38B0, 38A, 24V AC, 50Hz, main contactor, Schrack	1
15.	-1M4	Fan, PF22000, 19W, 0,12A, 230V, 50Hz, switchboard cooling, Schrack	1

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16. -5R5	Trimmer, 4,7kOhm/N, 0,5W, regulation of output frequency of freq.convertor	1
17. -5S5	The switch can be set in MAN (0) or Auto (1) mode, PSMB5D0, EK Industry Adamov	1
18. -1Q1	Switch, SQ63, 63A, 690V, main switch, EK Industry Adamov	1
19. -2SA5	Controller head PPFN1R4N, NC unit PL004002, EMERGENCY STOP, EK Industry	1
20. -1T4	Transformer, LP824040, 400VA, 400/230V, fan supply voltage, Schrack	1
21. -1T6	Transformer, RS123-2505, 100VA, 400/24/12V, control voltage, RS Components	1
22. -X0	Terminal box, 3x WT10 + 1x WT10 PE, switchboard power supply in, Wieland	1
23. -X1	Terminal box, 3xWT10 + 1x WT10 PE, power supply out for main motor, Wieland	1
24. -X2	Terminal box, 3x WT2,5 +1x WT4, output for blower fan supply, Wieland	1
25. -X3, -X4, -X5, -X6	Terminal box, WT 2,5 ... 8+2+3+3 pcs, sensors, external signals, Wieland	1

### Cable leading

1. WL01	CYKY 4x10, supply mains of the blower	not included
2. WL02	YSLCY 4x10,current supply of mains engine –1M1, Tekaben	
3. WL03	YSLY-JZ 3x1, current supply of fan engine –1M5, Tekaben	5
4. WS01	YSLY-OZ 2x0,75, connection temperature sensor –B1 witch PLC -2A4, Tekaben	5
5. WS04	YSLCY 2x0,5, connection tpressure sensor -B2 witch PLC -2A4, Tekaben	
6. WS05	YSLCY 2x0,5, connection pressure sensor –B3 with PLC -2A4, Tekaben	
7. WS06	YSLY-OZ 2x0,75, connection thermistor –5B5 frequency converter Danfoss, Tekaben	
8. WS09	YSLY-OZ 2x1, external control connected to, PLC -2A4	not included
9. WS10	YSLY-OZ 2x1, external signals connected to, PLC -2A4	not included
10. WS11	YSLYCY 2x1, external communication connected to, PLC -2A4	not included