Quick Start Guide for Kleedrive VFD

This guide briefly describes the external wiring, terminals, keypads, quick running, common function parameter settings, and common faults and solutions of VFD20 models.

You can visit our website www.klee.dk for more information.

⚠ Warning

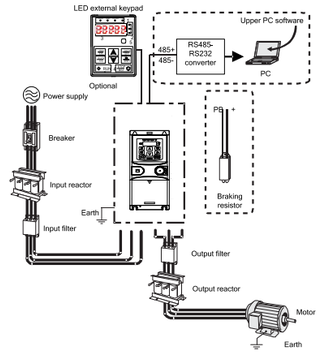
- This guide only provides the basic installation and commissioning information. Failure to comply with the safety instructions and installation and commissioning instructions in the relevant documentation may result in accidents such as equipment damage, personal injury, or even death.
- Only trained and qualified professionals are allowed to carry out related operations.

⚠ Danger

Do not perform any operations including wiring, inspection, or component replacement when power supply is applied. Before performing these operations, ensure all the input power supplies have been disconnected, and wait for at least the time designated on the VFD or until the DC bus voltage is less than 36V.

Minimum waiting time	VFD model
5 minutes	1PH 110V–120V 0.4–1.1kW; 1PH 200–240V 0.4–2.2kW; 3PH 220V–240V 0.4–55kW; 3PH 380V–480V 0.75–110kW; 3PH 520V–600V 0.75–110 kW
15 minutes	3PH 380V–480V 132–315kW
20 minutes	3PH 380V–480V ⩾ 350kW

1 External wiring



2 Terminal

Figure 2-1 Typical VFD wiring

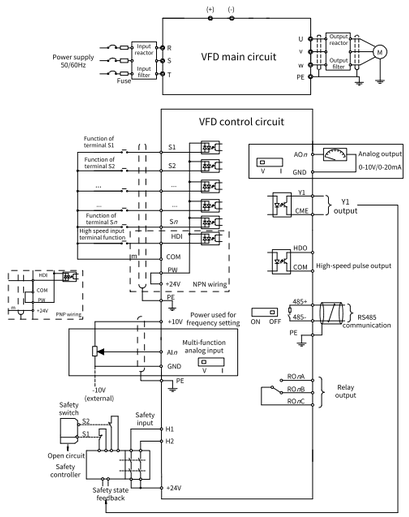


Table 2-1 VFD terminal description

Terminal	Description
Main circuit terminal	
R, S, T (or L, N)	3PH (or 1PH) AC input terminals, connected to the grid
U, V, W	3PH (or 1PH) AC output terminals, connected to the motor usually
P1	● P1 and (+) connect to external DC reactor terminals.

Terminal	Description
(+)	● (+) and (-) connect to external braking unit terminals or shared DC bus terminals. ● PB and (+) connect to external braking resistor terminals.
(-)	
PB	
⏚	PE terminal. The PE terminals of each machine must be grounded reliably.
Control circuit terminals	
+10V	Locally provided 10V power supply
AI*n*	Analog input. The default input type is voltage, which can be changed through the related jumper cap, DIP switch, or parameter.
GND	Reference ground of +10V
AO*n*	Analog output. Range: 0–10V or 0–20mA
RO*n*A	Relay output. RO*n*A: NO; RO*n*B: NC; RO*n*C: common Contact capacity: 3A/AC 250V, 1A/DC 30V
RO*n*B	
RO*n*C	
HDO	Switch capacity: 50mA/30V. Output frequency range: 0–50kHz
COM	Reference ground of +24V
CME	Common terminal of open collector output; short connected to COM by default
Y1–Y*n*	Switch capacity: 50mA/30V. Output frequency range: 0–1kHz
485+	RS485 differential signal communication port. The standard communication interface should use shielded twisted pair. Determine whether to connect the 120Ω terminal matching resistor of RS485 communication through the DIP switch or jumper.
485-	
PE	Grounding terminal
PW	External power input terminal for digital input circuits. In NPN mode, short connect PW and +24V. In PNP mode, short connect PW and COM.
+24V	User power supply provided by the VFD. Max. output current: 200mA
S1–S*n*	Digital input ● Internal impedance: 3.3kΩ ● 12–30V voltage input is acceptable ● Bidirectional input terminals, supporting both NPN and PNP connection methods ● Max. input frequency: 1kHz ● Programmable digital input terminals, the functions of which can be set through the related parameters
HDIA	● Channels for both high frequency pulse input and digital input ● Max. input frequency: 50kHz ● Duty ratio: 30%–70% ● Support for quadrature encoder input when both HDIA and HDIB are available, with the speed measurement function
HDIB	
+24V—H1	Safe Torque Off (STO) inputs ● STO redundant input, connected to the external NC contact. When the contact opens, STO acts and the VFD stops output. ● Safety input signal wires use shielded wires whose length is within 25m. ● The H1 and H2 terminals are short connected to +24V by default. Remove the jumper from the terminals before using the STO function.
+24V—H2	

Note:

- *n* is a natural number.
- The terminals of different series may be different. For detailed terminal wiring, see the full manual of the product you have.

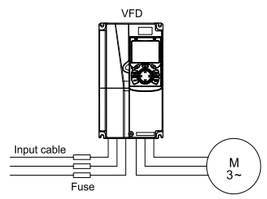
3 Wiring protection

3.1 Protecting the VFD and input power cable in short circuit

Protect the VFD and input power cable during short-circuit to avoid thermal overload.

Carry out protective measures according to the following requirements.

Figure 3-1 Fuse configuration



Note: Select the fuse according to operation manual. During short-circuit, the fuse will protect input power cables to avoid damage to the VFD; when internal short-circuit occurred to the VFD, it can protect neighboring equipment from being damaged.

3.1.1 Protecting the motor and motor cable in short circuit

If the motor cable is selected based on rated VFD current, the VFD will be able to protect the motor cable and motor during short circuit without other protective devices.

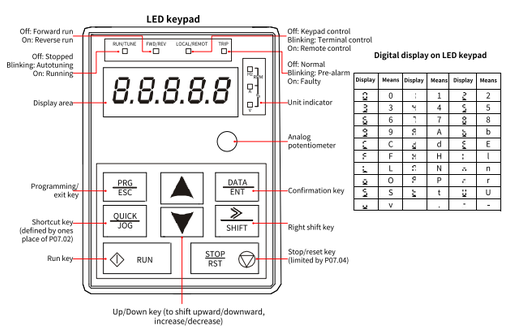
⚠	If the VFD is connected to multiple motors, it is a must to use a separated thermal overload switch or breaker to protect the cable and motor, which may require the fuse to cut off the short circuit current.

3.1.2 Protecting the motor and preventing thermal overload

According to the requirements, the motor must be protected to prevent thermal overload. Once overload is detected, you must cut off the current. The VFD is equipped with motor thermal overload protection function, which will block output and cut off the current (if necessary) to protect the motor.

4 Keypad

The keypad may vary depending on the product. Some products may support optional LCD keypads.



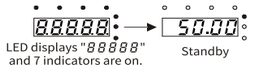
5 Quick running

5.1 Check before power-on

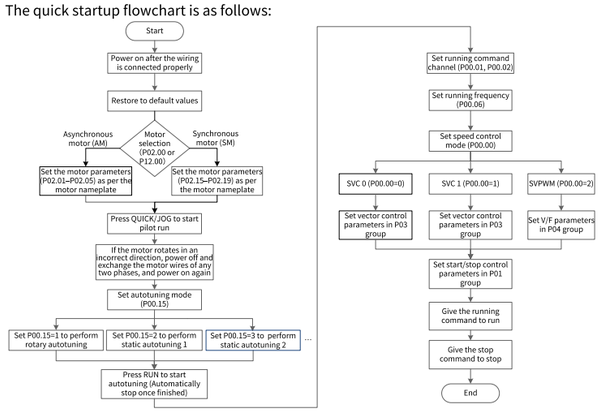
⚠	● Ensure that all terminals have been securely connected. ● Ensure that the motor power matches the VFD power.

5.2 Operating upon first power-on

After confirming the wiring and power are correct, close the air switch of the AC power at the VFD input side to power on the VFD. Using a LED keypad for example, the keypad displays 8.8.8.8.8. upon power-on and then the set frequency (50.00 in the example), indicating the VFD is initialized and ready to run. (For details about other types of keypad, see the full version of corresponding product manual.)



The quick startup flowchart is as follows:



6 Common function parameter setup

The following briefly describes only some common function parameters and typical values.

"○" indicates that the value of the parameter can be modified when the VFD is in stopped or running state.

"◎" indicates that the value of the parameter cannot be modified when the VFD is in running state.

"●" indicates that the value of the parameter is detected and recorded, and cannot be modified.

(The VFD automatically checks and constrains the modification of parameters, which helps prevent incorrect modifications.)

Note: Function parameters may vary with product. For details, see the full version of corresponding product manual.

Function code	Name	Description	Default	Modify
P00.00	Speed control mode	0: Sensorless vector control (SVC) mode 0 1: SVC 1 2: Space voltage vector control mode	Model depended	◎

Function code	Name	Description	Default	Modify
P00.01	Channel of running commands	0: Keypad 1: Terminal 2: Communication	0	○
P00.03	Max. output frequency	P00.04–400.00Hz	Model depended	◎
P00.04	Upper limit of running frequency	P00.05–P00.03 (Max. output frequency)	Model depended	◎
P00.05	Lower limit of running frequency	0.00Hz–P00.04 (Upper limit of running frequency)	0.00Hz	◎
P00.06	Setting channel of A frequency command	0: Keypad 1: AI1 (Corresponding to the keypad potentiometer) 2: AI2 (Corresponding to the AI terminal) 3: AI3 4: High-speed pulse HDI 5: Simple PLC program 6: Multi-step speed running 7: PID control 8: Modbus communication	0	○
P00.07	Setting channel of B frequency command		Model depended	○
P00.10	Frequency set through keypad	0.00 Hz–P00.03 (Max. output frequency)	Model depended	○
P00.11	ACC time 1	0.0–3600.0s	Model depended	○
P00.12	DEC time 1		Model depended	○
P00.13	Running direction	0: Run at the default direction. 1: Run at the opposite direction. 2: Disable reverse running	0	○
P00.15	Motor parameter autotuning	0: No operation 1: Rotary autotuning 2: Static autotuning 1 3: Static autotuning 2	0	◎
P00.18	Function parameter restore	0: No operation 1: Restore default values 2: Clear fault records 3: Lock all function codes	0	◎
P01.00	Start mode	0: Direct start 1: Start after DC braking 2: Start after speed tracking 1 2: Start after speed tracking 2	0	◎
P01.08	Stop mode	0: Decelerate to stop 1: Coast to stop	0	○
P01.09	Starting frequency of DC braking for stop	0.00Hz–P00.03 (Max. output frequency)	0.00Hz	○
P01.11	DC braking current for stop	0.0–100.0%	0.0%	○
P01.12	DC braking time for stop	0.00–50.00s	0.00s	○
P01.18	Terminal-based running command protection at power-on	0: The terminal running command is invalid at power-on 1: The terminal running command is valid at power-on	0	◎
P02.00	Type of motor 1	0: Asynchronous motor (AM) 1: Synchronous motor (SM)	0	◎
P02.01	Rated power of AM 1	0.1–3000.0kW	Model depended	◎
P02.02	Rated frequency of AM 1	0.01Hz–P00.03 (Max. output frequency)	Model depended	◎
P02.03	Rated speed of AM 1	1–60000rpm	Model depended	◎
P02.04	Rated voltage of AM 1	0–1200V	Model depended	◎
P02.05	Rated current of AM 1	0.8–6000.0A	Model depended	◎
P02.15	Rated power of SM 1	0.1–3000.0kW	Model depended	◎
P02.16	Rated frequency of SM 1	0.01Hz–P00.03 (Max. output frequency)	Model depended	◎
P02.17	Number of pole pairs of SM 1	1–128	2	◎
P02.18	Rated voltage of SM 1	0–1200V	Model depended	◎
P02.19	Rated current of SM 1	0.8–6000.0A	Model depended	◎
P02.23	Counter-emf of SM 1	0–10000	300	○
P03.00	Speed-loop proportional gain 1	0.0–200.0	20.0	○
P03.01	Speed-loop integral time 1	0.000–10.000s	0.200s	○
P03.03	Speed-loop proportional gain 2	0.0–200.0	20.0	○
P03.04	Speed-loop integral time 2	0.000–10.000s	0.200s	○
P03.09	Current-loop proportional coefficient P	0~65535	1000	○

Function code	Name	Description	Default	Modify
P03.11	Torque setting method	0: Torque control is invalid 1: Keypad (P03.12) 2: AI1 3: AI2 4: AI3 5: Pulse frequency HDI 6: Multi-step torque 7: Modbus communication	0	○
P04.01	Torque boost of motor 1	0.0%: (Automatic torque boost), 0.1%–10.0%	0	○
P04.09	V/F slip compensation gain of motor 1	0.0–200.0%	100.0%	○
P04.10	Low-frequency oscillation control factor of motor 1	0–100	10	○
P04.11	High-frequency oscillation control factor of motor 1	0–100	10	○
P05.01	Function of S1	0: No function 1: Run forward 2: Run reversely 3: Three-wire running control (SIN) 4: Jog forward 5: Jog reversely 6: Coast to stop 7: Reset faults 9: External fault input 10: Increase frequency setting (UP) 11: Decrease frequency setting (DOWN)	1	◎
P05.02	Function of S2		4	◎
P05.03	Function of S3		7	◎
P05.04	Function of S4		0	◎
P06.01	Y1 output	0: Invalid 1: Running 2: Running forward 3: Running reversely 4: Jogging 5: VFD in fault 6: Frequency level detection FDT1 8: Frequency reached **Note:** STO action is available for VFD20 (27: STO action).	0	○
P06.03	Relay output		1	○
P06.04			5	○
P06.14–P06.15	Analog output	0: Running frequency 1: Set frequency 3: Rotation speed (Relative to twice the motor synchronous rotation speed) 4: Output current (Relative to twice the VFD rated current) 5: Output current (Relative to twice the motor rated current) 6: Output voltage (Relative to 1.5 times the VFD rated voltage) 7: Output power (Relative to twice the motor rated power)	0	○
P06.16	HDO high-speed pulse output		0	○
P06.14–P06.26	AO output upper/lower limit settings	For details, see the full version of corresponding product manual.	Model depended	○
P07.00	User password	0–65535	0	○
P14.00	Local communication address	1–247 **Note:** The communication address of a slave cannot be set to 0.	1	○
P14.01	Communication baud rate	0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS 6: 57600BPS	4	○
P14.02	Data bit check	0: No check (N, 8, 1) for RTU 1: Even check (E, 8, 1) for RTU 2: Odd check (O, 8, 1) for RTU 3: No check (N, 8, 2) for RTU 4: Even check (E, 8, 2) for RTU 5: Odd check (O, 8, 2) for RTU **Note:** For VFD20, options 6–17 are available. For details, see the full version of corresponding product manual.	1	○

7 Common faults and solutions

Note: Our fault code scheme is being upgraded. Some products use the old scheme and the others use the new one, which are listed in "Fault code display".

Fault code display		Fault type	Possible cause	Solution
OUt1	E1	Inverter unit U-phase protection	● ACC/DEC is too fast; ● IGBT module is damaged. ● Misoperation caused by interference. ● Drive wires are poorly connected.	● Increase ACC/DEC time. ● Change the inverter unit. ● Check whether the devices and system are grounded reliably. ● Check whether drive wires are loose.
OUt2	E2	Inverter unit V-phase protection		
OUt3	E3	Inverter unit		

Fault code display		Fault type	Possible cause	Solution
		W-phase protection	● To-ground short circuit occurred. ● Sparks occurred inside due to poor use environment conditions.	● Check whether the motor wiring is normal and the motor-to-ground is short circuited. ● Remove the dust or oil stain inside the VFD regularly.
OC1	E4	Overcurrent during ACC	● ACC/DEC too fast. ● Grid voltage too low. ● VFD power too small. ● Load sudden change or exception. ● 3PH output current imbalance. ● Strong external interference sources (contactor switchover or improper grounding).	● Increase ACC/DEC time. ● Increase grid input voltage. ● Select a VFD with larger power. ● Check for motor stalling, short connection, and load device exceptions. ● Check for abnormal VFD 3PH output voltage and motor 3PH resistance imbalance. ● Check for strong interference (whether motor cable far away from contactor and system grounded reliably).
OC2	E5	Overcurrent during deceleration		
OC3	E6	Overcurrent during constant speed running		
OV1	E7	Overvoltage during ACC	● ACC/DEC time too short. ● Abnormal input voltage. ● Motor started during rotating. ● Load energy regeneration too large. ● Dynamic braking disabled.	● Increase ACC/DEC time. ● Check the input power. ● Use the speed tracking start function. ● Add dynamic braking devices or regenerative units. ● Set dynamic braking function parameters.
OV2	E8	Overvoltage during deceleration		
OV3	E9	Overvoltage during constant speed running		
UV	E10	Bus undervoltage fault	● Grid voltage too low. ● Abnormal voltage display. ● Abnormal buffer contactor closing.	● Increase grid input voltage. ● Contact us.
OL1	E11	Motor overload	● Grid voltage too low. ● Incorrect motor rated current. ● Motor stalling or load sudden change too great.	● Increase grid input voltage. ● Reset the motor rated current in the motor parameter group. ● Check the load and adjust the torque boost value.
OL2	E12	VFD overload	● R/S/T input phase loss or violent fluctuation. ● Input-side screws loosened.	● Check for abnormal input power and loose input cables. ● Set parameters to screen out the fault.
SPI	E13	Input phase loss	● Output cables broken or short connected to the ground. ● U/V/W output phase loss or seriously asymmetrical 3PH loads.	● Check for loose or broken output cables. ● Check for sharp load fluctuation and motor 3PH resistance imbalance.
SPO	E14	Output phase loss	● Air duct blocked or fan damaged. ● Ambient temperature too high. ● Long-time overload running.	● Ventilate the air duct or replace the fan. ● Keep good ventilation to lower ambient temperature. ● Select a VFD with larger power.
OH2	E16	Inverter module overheat	● Improper baud rate. ● Communication line fault. ● Incorrect communication address. ● Communication suffers from strong interference.	● Set a proper baud rate. ● Check the communication port wiring. ● Set the communication address correctly. ● Replace or change wiring to enhance anti-interference.
CE	E18	RS485 communication fault	● Motor capacity and VFD capacity mismatched. ● Improper motor parameter setting. ● Autotuned parameter settings deviate sharply from the standard ones. ● Autotuning timeout.	● Change the VFD model. ● Set the motor type and nameplate parameters correctly. ● Empty the motor load and re-perform autotuning. ● Check motor wiring and parameter settings. ● Check whether the upper limit frequency is greater than 2/3 of the rated frequency.
tE	E20	Motor autotuning fault	● R/S/T input phase loss or violent fluctuation. ● Input-side screws loosened.	● Check for abnormal input power and loose input cables. ● Set parameters to screen out the fault.
PIDE	E22	PID feedback offline fault	● PID feedback offline. ● PID feedback source disappears.	● Check PID feedback signal wires. ● Check PID feedback source.
dEu	E34	Speed deviation fault	Load too heavy or stalled.	● Check for overload, increase speed deviation detection time, or prolong ACC/DEC time. ● Check motor parameter settings and re-perform motor parameter autotuning. ● Check speed loop control parameter settings.
STo	E35	Mal-adjustment fault	● Load exception. ● Incorrect SM parameter settings. ● Autotuned motor	● Check for overload or stalling. ● Check motor parameter and counter EMF settings. ● Re-perform motor parameter

Fault code display		Fault type	Possible cause	Solution
			parameters inaccurate. ● VFD disconnected from the motor. ● Flux weakening application.	autotuning. ● Increase maladjustment detection time. ● Adjust flux weakening coefficient and current loop parameters.
STO	E40	Safe torque off	● Safe torque off function is enabled by external forces.	/
STL1	E41	Exception occurred to safe circuit of channel H1	● The wiring of STO is improper. ● Fault occurred to external switch of STO. ● Hardware fault occurred to safety circuit of channel H1/H2.	● Check whether terminal wiring of STO is proper and firm enough. ● Check whether external switch of STO can work properly. ● Replace the control board.
STL2	E42	Exception occurred to channel H2 safe circuit		
STL3	E43	Exception occurred to channel H1 and channel H2	Hardware fault occurred to STO circuit.	Replace the control board.

Appendix A Optional peripheral accessories

A.1 Power supply

Ensure that the voltage class of the VFD is consistent with that of the grid.

A.2 Cables

The sizes of the input power cables and motor cables must meet the local regulation.

- The input power cables and motor cables must be able to carry the corresponding load currents.
- The maximum temperature margin of the motor cables in continuous operation cannot be lower than 70°C.
- The conductivity of the PE grounding conductor is the same as that of the phase conductor, that is, the cross-sectional areas are the same.

Check the insulation conditions of the input power cable of a VFD according to the local regulations before connecting it.

Table A-1 Cable specifications

Model	Recommended cable size (mm²)		Size of connectable cable (mm²)			Terminal screw	Tightening torque (Nm)
	RST UVW	PE	RST UVW	P1, (+)	PE		
VFD20A 1x230V 0.4kW	1.5	1.5	1–4	1–4	1–4	M3	0.8
VFD20A 1x230V 0.75kW	1.5	1.5	1–4	1–4	1–4	M3	0.8
VFD20B 1x230V 1.5kW	2.5	2.5	1–4	1–4	1–4	M3	0.8
VFD20B 1x230V 2.2kW	2.5	2.5	1–4	1–4	1–4	M3	0.8
VFD20B 3x400V 0.75kW	1.5	1.5	1–1.5	1–1.5	1–1.5	M3	0.8
VFD20B 3x400V 1.5kW	1.5	1.5	1–1.5	1–1.5	1–1.5	M3	0.8
VFD20B 3x400V 2.2kW	1.5	1.5	1–1.5	1–1.5	1–1.5	M3	0.8
VFD20C 3x400V 4kW	2.5	2.5	2.5–6	2.5–6	2.5–6	M4	1.13
VFD20C 3x400V 5.5kW	2.5	2.5	2.5–6	2.5–6	2.5–6	M4	1.13
VFD20D 3x400V 7.5kW	4	4	4–10	4–10	4–10	M5	2.3
VFD20D 3x400V 11kW	6	6	4–10	4–10	4–10	M5	2.3
VFD20D 3x400V 15kW	6	6	4–10	4–10	4–10	M5	2.3
VFD20E 3x400V 18.5kW	10	10	10–16	10–16	10–16	M5	2.3
VFD20E 3x400V 22kW	16	16	10–16	10–16	10–16	M5	2.3
VFD20F 3x400V 30kW	25	16	25–50	25–50	16–25	M6	2.5
VFD20F 3x400V 37kW	25	16	25–50	25–50	16–25	M6	2.5
VFD20G 3x400V 45kW	35	16	35–70	35–70	16–35	M8	10
VFD20G 3x400V 55kW	50	25	35–70	35–70	16–35	M8	10
VFD20G 3x400V 75kW	70	35	35–70	35–70	16–35	M8	10
VFD20H 3x400V 90kW	95	50	70–120	70–120	50–70	M12	35
VFD20H 3x400V 110kW	120	70	70–120	70–120	50–70	M12	35

Note:

- Cables of the sizes recommended for the main circuit can be used in scenarios where the ambient temperature is lower than 40°C, the wiring distance is shorter than 100 m, and the current is the rated current.
- Terminals P1, (+), PB and (-) are used to connect to the DC reactor options and parts.

A.3 Fuse, breaker and electromagnetic contactor

You need to add a fuse to prevent overload.

You need to configure a manually manipulated molded case circuit breaker (MCCB) between the AC power supply and VFD. The breaker must be locked in the open state to facilitate installation and inspection. The capacity of the breaker needs to be 1.5 to 2 times the rated current of the VFD.

According to the working principle and structure of breakers, if the manufacturer's regulation is not followed, hot ionized gases may escape from the breaker enclosure when a short-circuit occurs. To ensure safe use, exercise extra caution when installing and placing the breaker. Follow the manufacturer's instructions.

To ensure safety, you can configure an electromagnetic contactor on the input side to control the switch-on and switch-off of the main circuit power, so that the input power supply of the VFD can be effectively cut off when a system fault occurs.

Table A-2 Fuse, breaker and electromagnetic contactor

Model	Fuse rated current (A)	Breaker rated current (A)	Contactor rated current (A)
VFD20A 1x230V 0.4kW	10	10	9
VFD20A 1x230V 0.75kW	16	16	12
VFD20B 1x230V 1.5kW	25	25	25
VFD20B 1x230V 2.2kW	50	40	32
VFD20B 3x400V 0.75kW	6	6	9
VFD20B 3x400V 1.5kW	10	10	9
VFD20B 3x400V 2.2kW	10	10	9
VFD20C 3x400V 4kW	25	25	25
VFD20C 3x400V 5.5kW	35	32	25
VFD20D 3x400V 7.5kW	50	40	38
VFD20D 3x400V 11kW	63	63	50
VFD20D 3x400V 15kW	63	63	50
VFD20E 3x400V 18.5kW	100	100	65
VFD20E 3x400V 22kW	100	100	80
VFD20F 3x400V 30kW	125	125	95
VFD20F 3x400V 37kW	150	160	115
VFD20G 3x400V 45kW	150	200	170
VFD20G 3x400V 55kW	200	200	170
VFD20G 3x400V 75kW	250	250	205
VFD20H 3x400V 90kW	325	315	245
VFD20H 3x400V 110kW	350	350	300

Note:

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes.

Appendix B Energy efficiency data

Table B-1 Power loss and IE class

Model	Relative loss (%)								Standby loss (W)	IE class
	(0;25)	(0;50)	(0;100)	(50;25)	(50;50)	(50;100)	(90;50)	(90;100)		
VFD20A 1x230V 0.4kW	2.00	2.00	2.41	1.90	1.70	2.10	1.20	2.10	5	IE2
VFD20A 1x230V 0.75kW	1.37	1.61	2.33	1.31	1.13	2.09	0.65	2.27	7	IE2
VFD20B 1x230V 1.5kW	1.17	1.47	2.20	1.00	1.27	1.94	0.93	2.61	8	IE2
VFD20B 1x230V 2.2kW	1.05	1.28	1.83	1.25	1.70	1.73	2.10	3.94	8	IE2
VFD20B 3x400V 0.75kW	1.79	2.07	2.54	2.02	2.13	2.94	1.55	2.36	7	IE2
VFD20B 3x400V 1.5kW	1.23	1.47	1.99	0.96	1.30	1.99	1.13	2.09	7	IE2
VFD20B 3x400V 2.2kW	1.26	1.44	2.07	1.28	1.68	2.25	1.62	2.49	8	IE2
VFD20C 3x400V 4kW	0.97	1.18	1.64	1.04	1.35	1.73	1.21	2.12	9	IE2
VFD20C 3x400V 5.5kW	0.96	1.10	1.94	1.04	1.37	2.28	1.28	2.66	9	IE2
VFD20D 3x400V 7.5kW	0.72	0.83	1.47	0.80	0.98	2.13	1.10	1.77	9	IE2
VFD20D 3x400V 11kW	0.57	0.79	1.46	0.57	0.98	1.86	0.93	2.05	6	IE2
VFD20D 3x400V 15kW	0.39	0.49	1.20	0.54	0.69	1.38	0.74	1.57	7	IE2
VFD20E 3x400V 18.5kW	0.51	0.70	1.15	0.72	0.98	1.61	0.91	1.56	11	IE2
VFD20E 3x400V 22kW	0.44	0.63	1.15	0.64	0.85	1.46	0.82	1.31	11	IE2
VFD20F 3x400V 30kW	0.50	0.67	1.18	0.68	0.85	1.37	0.80	1.41	13	IE2
VFD20F 3x400V 37kW	0.45	0.65	1.32	0.59	0.83	1.52	0.94	1.63	14	IE2
VFD20G 3x400V 45kW	0.46	0.65	1.32	0.73	0.94	1.42	0.92	1.57	21	IE2
VFD20G 3x400V 55kW	0.48	0.65	1.19	0.67	0.84	1.40	0.83	1.32	22	IE2
VFD20G 3x400V 75kW	0.41	0.58	1.06	0.48	0.65	1.22	0.72	1.35	22	IE2
VFD20H 3x400V 90kW	0.39	0.56	1.09	0.44	0.61	1.22	0.85	1.40	25	IE2
VFD20H 3x400V 110kW	0.41	0.59	1.23	0.5	0.70	1.55	0.75	1.69	28	IE2

Table B-2 Rated specifications

Model	Apparent power (kVA)	Rated output power (kW)	Rated output current (A)	Max. working temperature (°C)	Rated power frequency (Hz)	Rated power voltage (V)
VFD20A 1x230V 0.4kW	0.99	0.4	2.5	50°C Derate by 1% for every increase of 1°C when the temperature exceeds 40°C.	50Hz/60Hz Allowed range: 47–63Hz	1PH 230V
VFD20A 1x230V 0.75kW	1.67	0.75	4.2			
VFD20B 1x230V 1.5kW	2.98	1.5	7.5			
VFD20B 1x230V 2.2kW	3.98	2.2	10			
VFD20B 3x400V 0.75kW	1.73	0.75	2.5			3PH 400V
VFD20B 3x400V 1.5kW	2.90	1.5	4.2			
VFD20B 3x400V 2.2kW	3.81	2.2	5.5			
VFD20C 3x400V 4kW	6.58	4	9.5			
VFD20C 3x400V 5.5kW	9.69	5.5	14			
VFD20D 3x400V 7.5kW	12.81	7.5	18.5			
VFD20D 3x400V 11kW	17.32	11	25			
VFD20D 3x400V 15kW	22.17	15	32			
VFD20E 3x400V 18.5kW	26.32	18.5	38			
VFD20E 3x400V 22kW	31.17	22	45			
VFD20F 3x400V 30kW	41.56	30	60			
VFD20F 3x400V 37kW	51.96	37	75			
VFD20G 3x400V 45kW	63.73	45	92			
VFD20G 3x400V 55kW	79.67	55	115			
VFD20G 3x400V 75kW	103.92	75	150			
VFD20H 3x400V 90kW	124.70	90	180			
VFD20H 3x400V 110kW	148.95	110	215			

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