SAFEBACK | SMART AQUACULTURE | GUANGZHOU, CHINA

TK-FA20-300 AC/DC Module Power Supply

90–528 VAC input · 20 W output · 4000 VAC isolation · −40 to +70 °C · three packages

Product datasheet (EN) · Rev. 2026-10 · for export customers

1. Product overview

The **TK-FA20-300** series is the companion AC/DC module power supply for SAFEBACK aquaculture equipment. It delivers 20 W on a single output in 5 V, 12 V, 15 V or 24 V, and sits inside the pond-side control cabinet turning mains into the DC that the gateway, the data terminal, the water-quality probes and the twelve-way control board need.

Power at a pond is awkward in two ways. The voltage varies: small farms have single-phase 220 V only, larger ones run three-phase 380 V, and the far end of a rural feeder sags well below nominal. The environment is hostile too: a hot cabinet, frequent thunderstorms, little room, metal swarf. This series is built for that. **Input 90–528 VAC, AC or DC (100–745 VDC)**, so 220 V single-phase and 380 V phase-to-phase both connect directly and nobody has to check the supply type before ordering. **−40 to +70 °C**, **4000 VAC input-to-output isolation**, and a fully enclosed UL94V-0 plastic case that can be handled without touching live parts.



Fig. 1 TK-FA20-300 series, -TS DIN-rail version: FG / AC(N) / AC(L) input terminals on the left, +Vo / NC / NC / NC / −Vo output terminals on the right

Three packages: **H2** PCB-mount (70 × 48 × 24 mm, 130 g), **H2-T** terminal type (96 × 53.8 × 32.5 mm, 170 g) and **H2-TS** DIN-rail type (96 × 53.8 × 37 mm, 215 g, 35 mm rail). Use H2 on a board, -T where wires land on terminals, -TS in a standard control cabinet.

2. Key features

- **90–528 VAC wide-range input** — 220 V single-phase and 380 V phase-to-phase both work, and 100–745 VDC is accepted as well; one model covers the grid types of several markets.
- **20 W, four output voltages** — 5 V/4000 mA, 12 V/1660 mA, 15 V/1333 mA, 24 V/833 mA, which covers the usual DC loads in a pond cabinet.
- **No-load draw ≤0.5 W** — left powered 24 hours a day for a year, that is under 4.4 kWh of standby consumption.
- **Up to 84 % efficiency at full load** — 84 % on the 24 V model, 83 % on 12 V and 15 V, 78 % on 5 V, measured at nominal input after half an hour at full load.
- **4000 VAC isolation** — input to output, one minute, leakage below 5 mA; insulation resistance ≥100 MΩ, so the control side is not exposed to a primary-side fault.
- **−40 to +70 °C** — with the derating curves applied, usable up to 2000 m altitude; southern cabinets running hot have a documented derating basis instead of guesswork.
- **Three protections** — hiccup-mode short circuit that recovers on its own, overcurrent from 130 % Io, and overvoltage capped per output voltage.
- **Fully enclosed UL94V-0 case** — not an open board: swarf, tools and fingers stay outside. CLASS I safety class, which means FG must be earthed.
- **Three packages** — H2 PCB-mount, H2-T terminal, H2-TS 35 mm DIN rail; identical electrical specification, chosen by how it mounts.
- **EMC to CLASS B** — conducted and radiated disturbance meet CISPR32 / EN55032 CLASS B; ESD, surge and burst tested to the IEC/EN61000-4 series.
- **IEC / EN / UL62368** — tested to all three, which covers customers in Europe, North America and South-East Asia.

3. TK family and model numbering

Every SAFEBACK aquaculture product carries the **TK** prefix: **TK – category code + specification number**. Powered equipment uses rated power in watts, sensors use parameter count ×100, terminals use screen size ×100; gateways and control boards are numbered by role and configuration. A power supply is an accessory, so the source model is kept intact with TK- in front, which lets anyone check it line by line against the original specification and certification file.

Code	Category	Model	Meaning
GW	4G IoT gateway	TK-4G-GW	4G Cat.1 uplink (by role)
R12	12-way control board	TK-R12-SC4S-BG	R12 = 12 outputs; SC4S = 4 three-phase groups
YL	Impeller aerator	TK-YL1500	Rated 1500 W
YC	Waterwheel aerator (mains)	**TK-YC750SL**	Rated power 750 W, twin impeller

Code	Category	Model	Meaning
YC	Waterwheel aerator (mains)	**TK-YC1500SL**	Rated power 1500 W, four impellers
FS	Pneumatic feeder	TK-FS2000	Rated 2000 W, 30 m air conveying
—	Two-bag feeder	TK-150D	150 kg/h class; D = dual hopper
DO / PH / ORP	Single-parameter probes	TK-DO100 / TK-PH100 / TK-ORP100	One parameter each
MP	Multi-parameter probe	TK-MP500	Five parameters
FA	AC/DC module power supply	**TK-FA20-300SXXH2D4**	FA = AC/DC module; 20 = 20 W; 300 = wide-range 300 series; S = single output; XX = output voltage; H2D4 = package and process code

The full series designation is **TK-FA20-300SXXH2D4(-T)(-TS)**. Replace XX with the output voltage to get a specific model; **-T** is the terminal package, **-TS** the DIN-rail package, and no suffix means H2 PCB-mount. The 12 V rail version, for example, is **TK-FA20-300S12H2D4-TS**.

4. Technical specifications

4.1 Model selection

Model	Input (VAC)	Power P(W)	Output Vo(V)	Current Io(mA)	Max cap. load (uF)	Ripple (mVp-p)	Efficiency (%)
TK-FA20-300S05H2D4	90–528	20	5	4000	7000	90	78
TK-FA20-300S12H2D4	90–528	20	12	1660	5000	120	83
TK-FA20-300S15H2D4	90–528	20	15	1333	2000	120	83
TK-FA20-300S24H2D4	90–528	20	24	833	1000	150	84

Efficiency is a typical value, measured after half an hour at full load, with a tolerance of ±2 %; it is total output power divided by input power. Ripple and noise follow the parallel-line method at 20 MHz bandwidth (see 4.6). All four models are available in -T and -TS packages with identical electrical specifications. The table lists standard models; other output voltages can be confirmed with our sales desk.

4.2 Input

Item	Condition	Min	Typ	Max	Unit
Input voltage	AC input	90	230	528	VAC
Input voltage	DC input	100	325	745	VDC
Input frequency	—	47	50	63	Hz
Standby power	115 / 230 VAC	—	—	0.5	W
Input current	115 / 230 VAC	—	—	0.60 / 0.30	A
Inrush current	115 / 230 VAC	—	35 / 60	—	A
Leakage current	230 VAC / 50 Hz	—	0.5	—	mA
External fuse	Recommended, mandatory	2–3.15 A / 600 VAC slow-blow			—
Remote on/off (Ctrl)	—	Not provided			—
Hot swap	—	Not supported			—

4.3 Output

Item	Condition	Min	Typ	Max	Unit
Output accuracy	Full input range, any load	—	±2.0	±3.0	%
Line regulation	Nominal load	—	—	±0.5	%
Load regulation	Nominal input, 20–100 % load	—	—	±1.0	%
Ripple and noise	5–100 % load, 20 MHz	—	—	150	mVp-p
Dynamic overshoot	25↔50↔25 %, 50↔75↔50 %	−10.0	—	+10.0	%
Recovery time	As above	—	—	+5.0	ms
Minimum load	Single output	0	—	—	%
Temperature drift	—	—	—	±0.02	%/°C
Start-up delay	230 / 400 VAC, full load	—	—	4000	ms
Hold-up time	230 VAC, full load	—	50	—	ms
Hold-up time	400 VAC, full load	—	100	—	ms
Start-up overshoot	Full input range	≤10 % Vo			—

4.4 General

Item	Condition	Min	Typ	Max	Unit
Switching frequency	—	—	65	—	kHz
Operating temperature	With temperature derating	−40	—	+70	°C
Storage temperature	—	−40	—	+85	°C
Relative humidity	Non-condensing	10	—	90	%RH
Isolation voltage	In–out, 1 min, leakage <5 mA	4000	—	—	VAC
Insulation resistance	In–out, 500 VDC applied	100	—	—	MΩ
MTBF	MIL-HDBK-217F, 25 °C	300	—	—	k hours
Safety standard	IEC62368 / EN62368 / UL62368				—
Safety class	CLASS I (FG must be reliably earthed)				—
Case rating	UL94V-0, fully enclosed plastic				—
Vibration	10–55 Hz, 10 G, 30 min, X / Y / Z				—
Max altitude	2000 m				—
Soldering	Wave 260 ±4 °C / 5–10 s; hand 360 ±8 °C / 4–7 s				—

4.5 Protections

Protection	Trigger	Action and recovery
Output short circuit	Output shorted	Hiccup mode, continuous; recovers automatically once the fault clears
Output overcurrent	230 VAC input, starts at 130 % Io	Limits at 240 % Io; returns to normal when the load comes back
Output overvoltage	5 V ≤7.5 V; 12 V / 15 V ≤20 V; 24 V ≤30 V	Shuts the output down to protect the downstream circuit

4.6 EMC and test method

Sub-item	Standard	Criterion
Conducted disturbance (EMI)	CISPR32 / EN55032	CLASS B
Radiated disturbance (EMI)	CISPR32 / EN55032	CLASS B
Radiated immunity (EMS)	IEC/EN61000-4-3	10 V/m, criterion A
Conducted immunity (EMS)	IEC/EN61000-4-6	3 Vr.m.s, criterion A
ESD (EMS)	IEC/EN61000-4-2	Contact ±6 kV / air ±8 kV, criterion B
Surge (EMS)	IEC/EN61000-4-5	Line–line ±2 kV, criterion B; ±4 kV with the circuits in Figs. 2–3, criterion B
Electrical fast transient (EMS)	IEC/EN61000-4-4	±2 kV, criterion B; ±4 kV with the circuits in Figs. 2–3, criterion B
Voltage dips and interruptions (EMS)	IEC/EN61000-4-11	0–70 %, criterion B

Ripple and noise measurement: parallel-line connection, oscilloscope bandwidth 20 MHz (100 MHz scope), probe tip and ground lead removed, C1 (0.1 uF ceramic) and C2 (10 uF low-ESR electrolytic) in parallel at the probe. Sample acquisition mode. The output feeds an electronic load through a fixture board, and the sense line is taken directly from the output terminals; size the power leads to the output current.

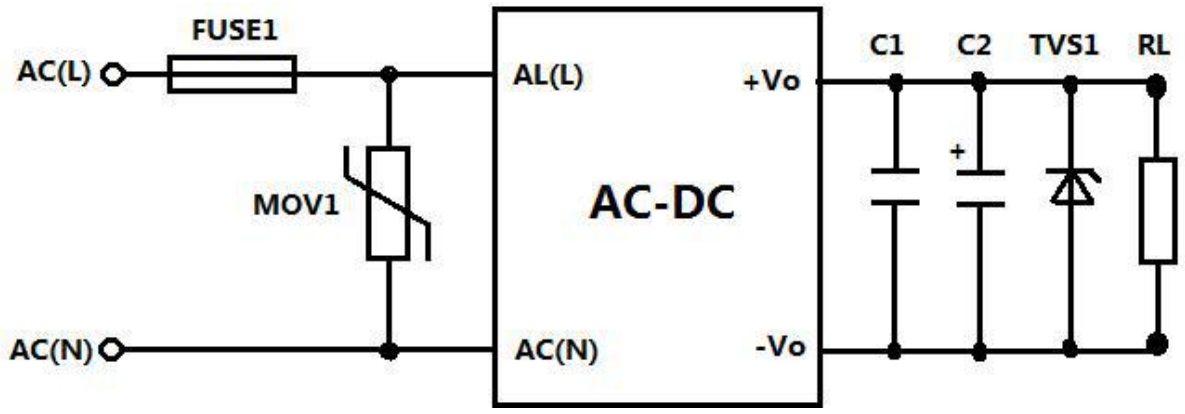


Fig. 2 Typical application circuit: FUSE1 mandatory, MOV1 absorbs surges, C1 / C2 filter, TVS1 protects the downstream circuit

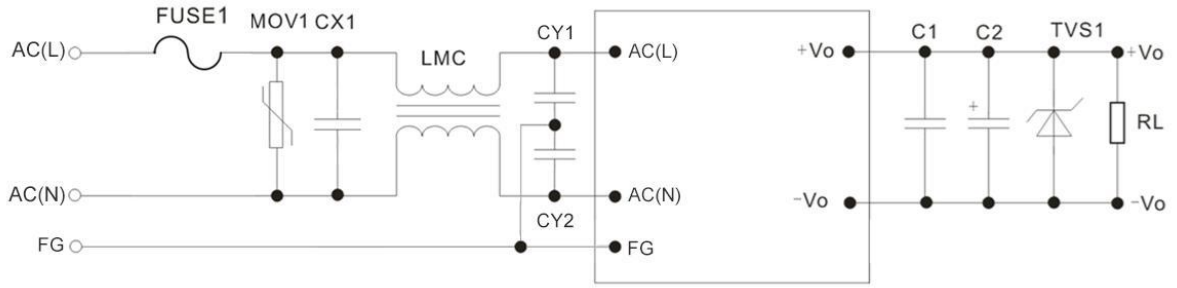


Fig. 3 Recommended EMC circuit for stricter environments: CX1 = X2/334K/530 VAC, LMC = common-mode choke 25 mH/0.6 A, CY1 / CY2 = Y1/102M/500 VAC

4.7 Derating curves

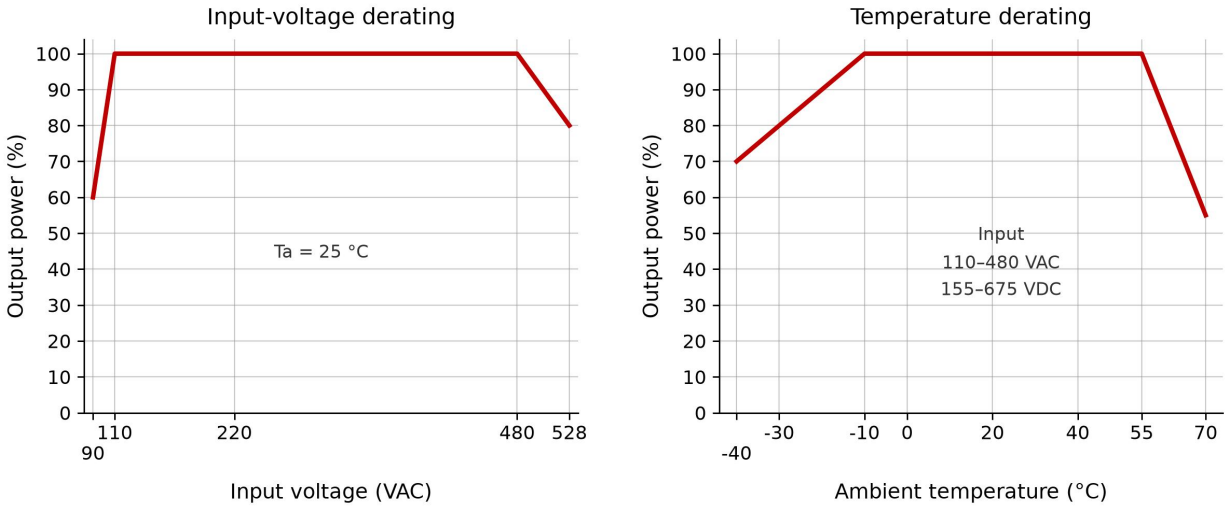


Fig. 4 Left: input-voltage derating (Ta = 25 °C). Right: temperature derating (input 110–480 VAC / 155–675 VDC).

Two ranges need input-voltage derating: 90–110 VAC (100–155 VDC) and 480–528 VAC (675–745 VDC). At 90 VAC the available output falls to 60 %, and at 528 VAC to 80 %. Temperature derating follows the right-hand curve: 70 % at −40 °C, full power from −10 to 55 °C, 55 % at 70 °C. Where both apply, take the stricter of the two. The unit is designed for natural convection cooling; contact us before fitting it into a sealed enclosure.

CE certification covers an input range of 100–400 VAC. Outside that range (480–528 VAC, for instance) the unit still works but is not covered by the CE certificate, which matters for tenders and certification audits.

5. How it works

Mains enters at AC(L) / AC(N), is rectified and filtered into high-voltage DC, then chopped by a high-frequency switching stage (65 kHz) and coupled through an isolation transformer to the secondary side, where it is rectified and filtered again into a stable DC output. A feedback loop returns the output voltage to the primary and adjusts duty cycle to hold the set point. Input moving from 90 V to 528 V is absorbed by that loop; there is no range switch to set.

The isolation transformer is the safety boundary. Primary to secondary withstands **4000 VAC for one minute**, with insulation resistance of at least 100 MΩ. Control circuits, probes and communication lines all sit on the secondary side, so a surge or fault on the mains side does not reach them directly. That is also why a CLASS I unit needs FG solidly earthed: the case and internal shielding need a path to discharge interference.

Protection works in three layers. A shorted output puts the unit into hiccup mode, retrying periodically and recovering as soon as the fault clears. Overcurrent starts limiting at 130 % Io and caps at 240 % Io, so the unit never sits there cooking a component. Overvoltage is capped per output (7.5 V on the 5 V model, 20 V on 12 V and 15 V, 30 V on 24 V) and shuts the output down to protect what is downstream.

6. Installation and use

6.1 Pin-out

Pin	H2 PCB-mount	-T / -TS	Function
1	FG	FG	Earth. Mandatory on a CLASS I unit; never leave floating
2	AC(N)	AC(N)	Input neutral (on a three-phase supply this carries the second live, see section 8)
3	AC(L)	AC(L)	Input live
4	+Vo	+Vo	Output positive
5–7	NP	NC	No connection
8	−Vo	−Vo	Output negative
9	NP	—	H2 package only; no connection

6.2 Wiring

- **Earth first, then power** — on a CLASS I unit a floating FG lets the case sit at an induced potential. Connect FG, then the output, then the input.
- **The external fuse is not optional** — 2–3.15 A / 600 VAC slow-blow in series with AC(L).
- **Do not swap L and N** — the unit works either way after rectification, but with them swapped the fuse ends up in the neutral, so a fault cannot break the live conductor.
- **Size output leads to the current** — the 5 V model delivers 4 A; undersized cable drops voltage and the probe readings drift with it.
- **Do not share a small supply with inductive loads** — contactors and relays pull the rail down when they operate, the module restarts, and the control board resets with it.

6.3 Mounting and clearance

The H2 version solders to a PCB with pads laid out to the nine-pin definition. The H2-T lands wires on terminals and fixes to a base plate or bracket with M3 screws through the mounting ears. The H2-TS clips to a standard 35 mm rail and lines up with other rail-mounted components. All three cool by natural convection, so **leave at least 10 mm of free air on every side**, keep them clear of hot components and do not bury them in a wiring loom.

Package	Model form	Dimensions L×W×H	Weight	Where it fits
H2 PCB-mount	TK-FA20-300SXXH2D4	70.0 × 48.0 × 24.0 mm	130 g	PCB mount
H2-T terminal	TK-FA20-300SXXH2D4-T	96.0 × 53.8 × 32.5 mm	170 g	Terminals, screw-fixed
H2-TS DIN-rail	TK-FA20-300SXXH2D4-TS	96.0 × 53.8 × 37.0 mm	215 g	35 mm rail, side by side

6.4 Derating in practice

A sealed cabinet, a summer cabinet temperature above 55 °C, or a supply that sits below 110 VAC all call for derating per 4.7. Do not size the load to the full 20 W in those conditions. Natural convection

is the design assumption; check with us before using the unit in a sealed enclosure.

6.5 Soldering

Wave soldering 260 ±4 °C for 5–10 s; hand soldering 360 ±8 °C for 4–7 s. Pins must not be under load while soldering, and flux residue should be cleaned afterwards.

6.6 Surge and lightning protection

For thunderstorm regions, add the circuit in Fig. 2: MOV1, the CX1 X-capacitor, the LMC common-mode choke, CY1 / CY2 and TVS1 for the downstream circuit. Where surge and burst tests must hold at ±4 kV, use the full-wave or half-wave arrangement of Figs. 3 and 4 with MOV 20D821K/6500A, a 2 A/1000 V rectifier, R1–R3 at 10 Ω/5 W wirewound and a 2.5 A/600 VAC slow-blow fuse. Fit TVS1: if the module ever fails, it is what saves the circuit behind it.

7. Configuration and selection

7.1 Choose the voltage by load

SAFEBACK terminals, probes and control boards all run on 12 V, so the 12 V model (TK-FA20-300S12H2D4, 1660 mA) is the workhorse. Pick 24 V where the equipment calls for it, and 5 V or 15 V on request.

7.2 Check the power budget first

SAFEBACK equipment	Supply requirement	Suggested model	Headroom	Verdict
Data terminal TK-4G-GW	DC 6–36 V, 50 mA typical, 300 mA max	TK-FA20-300S12H2D4	approx. 1.36 A	Fits
Water-quality probes (DO / PH / ORP)	DC 12 V, about 20 mA each	TK-FA20-300S12H2D4	ample	Fits
12-way control board TK-R12	DC 12 V, keep at least 1 A in reserve	TK-FA20-300S12H2D4	approx. 0.66 A	Fits
4G gateway TK-4G-GW	DC 12 V, ≥2 A (24 W) recommended	—	−0.34 A	**Does not fit**

Gateway peak current rises with 4G transmission, and the 2 A figure already includes margin. Feeding a gateway from a 20 W module shows up as a rail sag at each transmission and a module restart, which the site sees as a gateway that keeps dropping off. Use a 30 W model or larger for the gateway, and a separate supply where several control boards are paralleled. This note is here to stop that happening in the field; it is not a defect in the module.

7.3 Choose the package by mounting

H2 for board mount, H2-T where wires land on terminals, H2-TS for a standard rail cabinet. Electrical specifications are identical across the three; price and lead time are quoted per package.

7.4 Several rails

The series is single-output; fit one unit per voltage a system needs. Do not parallel two modules to raise current — there is no current sharing, and the two will fight each other.

8. Notes for regional markets

This is an AC-DC power module: 90–528 VAC input (100–745 VDC), 47–63 Hz. Vietnam 220 V, Malaysia

240 V, India 230 V, the Philippines 220 V / 60 Hz and 480 V three-phase all fall inside that window — no model change is needed for voltage. What differs is the plug, the certification and the mounting. Check the table first.

Country / region	Single-phase	Three-phase	Frequency	Relation to this unit
Vietnam	220 V	380 V	50 Hz	Identical
Thailand	220 V	380 V	50 Hz	Identical
Indonesia	220 V	380 V	50 Hz	Identical
Cambodia	220 V	380 V	50 Hz	Identical
Bangladesh	220 V	380 V	50 Hz	Identical
Mongolia	220 V	380 V	50 Hz	Identical
Myanmar	230 V	400 V	50 Hz	+5%
Singapore	230 V	400 V	50 Hz	+5%
Malaysia	240 V	415 V	50 Hz	+9%
India	230 V	400 / 415 V	50 Hz	+5–9%
Philippines	220 V	380 / 480 V	60 Hz	Frequency differs

8.1 Fully compatible — 380 V / 50 Hz

- **Vietnam, Thailand, Indonesia, Cambodia, Bangladesh, Mongolia** — These six markets use the same low-voltage system as China: 380 V three-phase, 220 V phase-to-neutral, 50 Hz. The machine connects directly — no transformer, no re-wound motor. This is where the TK series is easiest to sell against European or American equipment.
- **Vietnam is the reference market** — 0.4 kV three-phase four-wire, 380 V between phases, 220 V phase-to-neutral, 50 Hz — the same as China. Small ponds in the south often have only a single-phase 220 V service, or three-phase with too little capacity; tell us the service type, transformer rating and existing load before ordering. If a single-phase machine is required, specify the D configuration.
- **Phase loss and voltage sag** — Voltage sag at the end of a rural feeder, and phase loss, are the number-one cause of burnt motors — not the voltage level. Fit a phase-failure overload relay per machine; if you run demand-based aeration (C configuration), the control board already provides that protection.

8.2 Wide-range coverage — 400 to 528 V / 50 Hz

- **Malaysia 415 V, India 400–415 V, Singapore 400 V, the Philippines 480 V — no transformer needed** — These voltages look higher than 380 V, but they are not a problem for our machines: the control supply is a 90–528 VAC wide-range input. Single-phase 220 V, 380 V phase-to-phase, 440 / 480 V — all accepted, and 100–745 VDC as well. No step-down transformer, no country-

specific model. One machine covers Southeast Asia.

- **CE covers 100–400 VAC only — say so plainly** — Operation between 480 and 528 VAC is fine, but it sits outside the CE certification range. Quote within 400 VAC for tenders and certification files; where 480 V is genuinely used, state it in the technical deviation sheet rather than glossing over it — this is exactly what a customer's acceptance engineer will check.
- **The motor side still deserves a glance** — A wide-range control supply does not make the motor wide-range. A 380 V three-phase motor on a 415 V supply sees +9.2%, which is inside the ±10% window of IEC 60034-1 and will run; but in hot, humid pond-side enclosures the thermal margin is thin, so for continuous full-load duty confirm the actual voltage once, or take one frame size up. Same logic for 240 V single-phase in Malaysia.

8.3 Different frequency — the Philippines at 60 Hz

- **A 50 Hz motor must not be connected to a 60 Hz supply** — The Philippines runs 220 V / 60 Hz nationwide, with 380 V or 480 V three-phase for industry. On 60 Hz a 50 Hz motor turns 20% faster; for impeller and fan loads shaft power rises with the square to cube of speed, so the demand reaches 1.4–1.7 times rated power — this is not 'a bit faster', it is guaranteed overload.
- **Three ways out — decide before ordering** — ① Order a 60 Hz motor; cleanest. ② Run a VFD with the frequency clamped to 50 Hz, at the cost of about 17% of output. ③ Size up one frame and run it at 60 Hz. This has to be settled at the order stage; it cannot be fixed in the field.
- **Confirm the three-phase voltage as well** — Both 380 V and 480 V three-phase exist in the Philippines — legacy US-era projects are usually 480 V, local distribution usually 380 V. Ask the customer to photograph the panel nameplate before ordering.

8.4 The wide input range is the main advantage

- **90–528 VAC input covers every grid in the region** — Single-phase 220 V, 380 V phase-to-phase, Malaysia 415 V, the Philippines 480 V — all inside the window; 100–745 VDC as well. No model change for voltage and no step-down transformer.
- **47–63 Hz, both frequencies** — 50 Hz and 60 Hz both work; the Philippines does not need a separate 60 Hz version.
- **Size the output against the load** — The 20 W output comfortably feeds a gateway, control board or probes; work out the peak before adding heaters or motor loads.

8.5 Climate and corrosion

- **Hot and humid** — Across Southeast Asia: enclosures IP55 or better with desiccant inside; surge protection on the incoming supply, essential in thunderstorm areas.
- **Salt spray** — Coastal salt spray attacks terminals and PCB solder joints. Inspect terminals every six months, apply anti-oxidation grease, and specify stainless or coated enclosures.

- **Monsoon flooding** — India, Bangladesh, Myanmar: mount above the historical flood level, run cables on trays or overhead.

8.6 Certification and documents

- **Mandatory certification differs by country** — Vietnam CR (QCVN 4:2009/BKHCN for low-voltage equipment), Thailand TISI, Indonesia SNI, the Philippines BPS/PS or ICC, Malaysia SIRIM / ST, India BIS. Most schemes are mandatory only for certain power ranges — confirm against the local customs requirement.
- **CE and IEC reports are the passport** — Beyond the local schemes, a CE declaration and IEC test reports are the two documents customers ask for most, tenders in particular. Ask before ordering and we ship them with the goods.
- **Language of the documents** — Standard documentation is bilingual Chinese/English. Vietnamese, Thai, Indonesian or Tagalog manuals and nameplates must be requested in advance — they are typeset separately, priced separately, and extend the lead time.

8.7 Five questions before ordering

① Is the pond service three-phase or single-phase? What is the transformer rating?

② What is the measured voltage on site? — the actual reading, not the nominal figure.

③ Is the frequency 50 Hz or 60 Hz? — the Philippines must be confirmed separately.

④ Is the water fresh, brackish or salt? Roughly what salinity?

⑤ Which language do you need for the manual and the nameplate?

This table is a general judgement. Province-level differences — a rural feeder that sits low all year, an extra clearance step at a particular port, a local subsidy scheme — should be added by the local sales team to the project file. For a country not listed here, judge by the same three dimensions: voltage, frequency, certification; if in doubt, ask the factory.

9. Frequently asked questions

Can it run straight off 380 V three-phase?Yes — connect two lives, which gives 380 V phase-to-phase, inside the 90–528 VAC range. Do not connect all three; the input is single-phase.

What does it draw with no load?0.5 W or less. Powered continuously for 365 days, that is under 4.4 kWh.

Can the output be trimmed?The output is fixed at the factory; there is no potentiometer and no field adjustment. Choose the model for the voltage you need, or ask us about a custom unit.

Can two units be paralleled for more current?No. There is no current sharing, so the modules pull against each other and the output becomes unstable.

Is it hot-swappable?No. Pulling it live arcs at the input, which the fuse and terminals will not take; isolate before servicing.

Is there a remote on/off input?No. For remote switching, put a contactor or relay on the input side, driven from a SAFEBACK control board.

The case is plastic — is that safe?The case is UL94V-0 flame retardant and the unit is encapsulated, safety class CLASS I — provided FG is properly earthed. Without the earth connection it does not meet its CLASS I conditions of use.

Will the 12 V model run the gateway?No. The gateway wants ≥2 A (24 W) and the 12 V model supplies 1660 mA. Use a 30 W unit or larger for the gateway.

What is the warranty?One year on the unit, counted from the date of manufacture.

10. Packing, delivery and commercial terms

- **Packing** — each unit in an antistatic bag and carton, bulk in an outer carton; quantities and carton dimensions as per the packing list.
- **Documents** — Chinese and English manuals; Vietnamese available to order.
- **Warranty** — one year from the date of manufacture. Lightning damage, water ingress, unauthorised repair and use outside the specification are excluded.
- **Not included** — external fuse, MOV, TVS, common-mode choke and other external components; the 35 mm rail is supplied with the cabinet by the customer.
- **Lead time** — standard models from stock; non-standard voltages and volume orders confirmed against the production schedule.
- **Note** — specifications here are for selection reference and are superseded by the manual shipped with the unit and by the contract. The product is under continuous development and data may change without notice.

11. Contact

SAFEBACK — Guangzhou Hotekey Electronics Co., Ltd.

Address: Floor 1, Building B, No. 885 Shenzhou Road, Huangpu District, Guangzhou, China

Web: kantangren.com | Email: luka@hotekey.com | WhatsApp: +86 139 2518 8886

Specifications are subject to change without notice as the product is improved; confirm current data before tendering or volume orders.