

HT CT-OPERATED

Kushal HTCT

3-Phase 4-Wire HT CT-Operated Smart Meter

Accuracy Class 0.2S

For high-tension consumers, grid interface points and bulk C&I supply, where the premium 0.2S accuracy class protects large energy volumes on both import and export.

Reference voltage	**3 × 63.5 V (Ph–N)**
Current rating	**I_b 5 A / 1 A, I_{max} 10 A / 2 A**
Best-case active-energy error	**± 0.2 %**
Metered quantities	**kWh · kVAh · kVArh (lag/lead)**
Time-of-Use	**Programmable zones & seasons**
Communication	**Cellular + RS-485 + optical**
RTC accuracy	**≤ ±3 min / year**
Digital inputs	**4 × DI (feeder variant)**
Ingress protection	**IP51**

Premium 0.2S accuracy · RS-485 serial port · Net / bidirectional · DLMS/COSEM · Tamper logging

TECHNICAL SPECIFICATIONS

Metrology & electrical data

Metrology & Accuracy

Parameter	Kushal Magna (LTCT)	Kushal HTCT
Accuracy class	**Class 0.5S**	**Class 0.2S**
Active-energy error — UPF, I_b–I_{max}	± 0.5 %	± 0.2 %
Active-energy error — UPF, 1–5 % I_b	± 1.0 %	± 0.4 %
Error at 0.5 lag / 0.8 lead (0.1 I_b–I_{max})	± 0.6 %	± 0.3 %
Starting current	0.1 % I_b	0.1 % I_b
Running with no load	No output pulse up to 115 % of reference voltage	
Meter-constant accuracy	± 0.1 %	± 0.04 %
Temperature coefficient (UPF)	≤ 0.030 % / °C	≤ 0.010 % / °C
Initial start-up	Fully functional within 5 s of applying rated voltage	
Energy quadrants	Four-quadrant; independent import & export registers	
Meter constant (pulse rate)	8 000 imp/kWh	32 000 imp/kWh

Electrical & Dielectric

Parameter	Kushal Magna (LTCT)	Kushal HTCT
Reference voltage	3 × 240 V (Ph–N)	3 × 63.5 V (Ph–N)
Operating voltage range	70 %–120 % of reference voltage	
Basic / maximum current	I_b 5 A · I_{max} 10 A	I_b 5/1 A · I_{max} 10/2 A
Reference frequency	50 Hz ± 5 %	
Power-factor range	Zero lag → Unity → Zero lead	
Short-time overcurrent withstand	20 × I_{max} for 0.5 s	
Impulse voltage withstand (1.2/50 µs)	6 kV	
Power-frequency withstand (1 min)	4 kV AC	
Insulation resistance	> 5 MΩ (circuits–frame) · > 50 MΩ (circuit–circuit)	
Voltage-circuit power consumption	≤ 1.5 W and ≤ 10 VA per phase	
Current-circuit burden	≤ 1.0 VA per phase at basic current	
ESD immunity	15 kV air · 8 kV contact discharge	
EMC immunity	RF field, fast-transient burst & surge immunity	
Surface temperature rise	≤ 20 °C at 25–45 °C ambient	

TECHNICAL SPECIFICATIONS

Environmental & mechanical data

Environmental & Climatic

Parameter	Specification (both models)
Specified operating temperature	0 °C to +55 °C
Limit operating temperature	−10 °C to +60 °C
Storage temperature	−25 °C to +70 °C
Reference temperature	27 °C
Relative humidity	< 75 % annual mean; up to < 95 % for 30 days/year
Ingress protection	IP51 — dust-protected and drip-proof
Climatic endurance	Dry-heat, cold and damp-heat cyclic tested
Resistance to heat & fire (glow-wire)	Terminal block 960 °C · cover & case 650 °C
UV resistance	UV-stabilised enclosure and display module

Mechanical & Construction

Parameter	Specification (both models)
Enclosure material	High-grade, fire-retardant, UV-stabilised polycarbonate; non-breakable
Mounting	Projection type; dust- & moisture-proof; 1 top + 2 bottom fixings
Body wall thickness	≈ 2.0 mm
Shock withstand	40 g peak, 18 ms half-sine pulse
Vibration withstand	10–150 Hz sweep
Impact	Spring-hammer impact tested
Terminal block	Hole depth ≥ 20 mm · internal Ø ≥ 5.5 mm · centre-to-centre ≥ 16 mm
Terminal screws	Brass, M4
Terminal cover	Hinged, sealable; connection diagram moulded on cover
Display	Backlit STN LCD, ≥ 8 digits, ≥ 8 mm characters, ±60° viewing angle
Nameplate	Permanent marking with QR-code identification

TECHNICAL SPECIFICATIONS

Measurement, communication & security

Measurement & Power Quality

Parameter	Specification
Energy quantities	Active (kWh), apparent (kVAh), reactive (kVArh lag & lead) — import & export
Instantaneous parameters	Per-phase & neutral current, per-phase voltage, kW, kVA, power factor
Maximum demand	kW & kVA with date/time; integration period configurable 15 / 30 min
Time-of-Use / ToD	Up to 8 zones with multi-season profiles (configurable)
Load survey	Configurable interval; ≥ 35 days of interval data
Billing history	12 months of historical billing registers
Display modes	Auto-scroll, push-button and high-resolution; freezes on cover-open

Communication & Data

Parameter	Specification	
WAN communication	Cellular (SIM / e-SIM) and RF-Mesh — field-swappable plug-in module	
Local communication	Optical port (both models) · RS-485 serial port on Kushal HTCT	
Data model	DLMS/COSEM (Category D3)	
Firmware upgrade	Secure remote (over-the-air) upgrade	
Power event reporting	First-breath (power-on) & last-gasp (power-off) push to head-end	
Real-time clock drift	≤ 5 min / year	≤ 3 min / year
Non-volatile memory retention	≥ 12 years; data recoverable if meter is damaged	
Battery backup	Separate lithium battery for RTC & power-off display; ≥ 10-year life	

Security & Tamper Detection

Parameter	Specification
Tamper & abnormal conditions	Voltage failure/unbalance/over- & under-voltage, current reversal/unbalance/bypass, CT open or missing, neutral disturbance, overload
Magnetic immunity	Detects & withstands DC and AC abnormal magnetic influence
Physical security	Cover-open and communication-module removal detection (logged in battery mode)
Event log	≥ 300 time-stamped events, logged and alarmed to head-end
Access control	Authenticated remote configuration & firmware upgrade; secure communication