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E-BOOK 10 INTERMEDIATE EDITION

Cable Sizing, LT Panel & Short-Circuit (kA) Guide

Current, Voltage Drop, Derating, K Factor and Main DB Ratings Made Practical



FIG 10.1 — PCC / MCC SWITCHGEAR & SHORT-CIRCUIT FAULT WITHSTAND

SYLLABUS
10 Structured Chapters

CALCULATIONS
Worked SI Examples & Tables

SITE READY
Forms & Hinglish Glossary

Shree Ganesh Enterprises (SGE) — AMC MEP 24x7
Fire Fighting · Fire Alarm · Electrical · Plumbing · HVAC · IBMS · AMC

1st Edition, 2026
sge.org.in/ebooks/cable-sizing-lt-panel-short-circuit-guide

Cable Sizing, LT Panel & Short-Circuit (kA) Guide

Current, Voltage Drop, Derating, K Factor and Main DB Ratings Made Practical

A practical electrical design and site execution guide covering connected/demand load estimation, the 3-step LT cable sizing method (ampacity with derating, mV/A/m voltage drop, and I2t short-circuit withstand), transformer prospective fault current (kA) for breaker selection, clear resolution of 'K factor' vs 'kA rating', LT panel busbars, and pre-energisation testing.

Intended Audience: Electrical site engineers, LT panel builders, MEP project supervisors, commissioning engineers, and engineering students verifying feeder calculations.

Engineering Notice & Standards Policy

This publication is an educational and field-reference guide prepared by **Shree Ganesh Enterprises (SGE)**. It is **not** a substitute for a stamped project design, statutory approval, or the governing text of the National Building Code of India (NBC), Bureau of Indian Standards (BIS) codes, Indian Electricity Rules / CEA Regulations, or your State/Municipal Fire Service Bye-Laws. Standards are cited at document level; always verify the **current applicable edition**, manufacturer datasheets, and local amendments before design, procurement, testing, or certification.

Worked numerical examples across this book are illustrative engineering demonstrations. All design inputs, pipe friction factors, battery deratings, and protective clearances must be re-checked for project conditions by a competent licensed professional. High-voltage electrical testing, pump-room servicing, and gaseous fire suppression operations can be fatal if undertaken without qualified personnel, written Permits-to-Work, and Lockout-Tagout (LOTO) controls.

Roman-script Hindi/Hinglish site terms are included cleanly to assist execution teams; formal English engineering terminology governs contractual and code interpretations.

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What You Will Learn

- Calculate accurate 3-phase and single-phase Full Load Currents (FLA) from motor kW and panel kVA
- Select Cu vs Al and PVC vs XLPE vs FRLS/FS cable insulation cleanly using ambient and grouping derating
- Execute quick mV/A/m voltage drop arithmetic to stop motor under-voltage burnout on long runs
- Calculate prospective short-circuit current (Isc in kA) from transformer %Z to pick safe Main DB breakers
- Separate the two meanings of 'K factor' cleanly (adiabatic cable withstand 'k' vs harmonic K-factor rating)
- Check LT panel busbar density, armour gland earthing, insulation resistance (IR), and Lockout-Tagout safety

Chapter 1: Connected Load, Demand Factor and 3-Phase Current Calculation

Sizing Begins with Accurate Amperes, Not Wild Guesses

Buying a heavier cable than needed drains project budgets; picking one size too thin overheats insulation inside trays, starves fire pump motors during voltage dips, and melts terminations. Every calculation starts cleanly from **Power to Amperes**.

- **Connected Load:** Total sum of nameplate kW / kVA across every appliance wired onto a distribution board.
- **Maximum Demand:** Connected Load multiplied by **Diversity / Demand Factor** (for instance, an office tower does not run every lift, HVAC chiller, microwave, and spare hydrant pump simultaneously at 100% nameplate load—except dedicated individual motor feeders like a single fire pump, which always size at **100% Full Load + starting margin!**).

FORMULA

`Three-Phase Full Load Current (415 V AC nominal): I_3ph (Amps) = (Power_W) / (1.732 x V_ll x pf x efficiency) Single-Phase Full Load Current (230 V AC nominal): I_1ph (Amps) = (Power_W) / (V_ln x pf x efficiency)` *(For kVA equipment like transformers or ups heaters directly: drop pf and efficiency since kVA already represents apparent power: I_3ph = (kVA x 1,000) / (1.732 x 415) !)*

WORKED EXAMPLE 1

45 kW Fire Pump Motor Full-Load Current (Illustrative). A three-phase 415 V fire pump motor has rated shaft mechanical output **45 kW**, assumed power factor **0.85**, and assumed motor efficiency **92% (0.92)**.

Electrical input power drawn = `45,000 W / 0.92 = 48,913 W`. Full Load Current (FLA) = `48,913 / (1.73205 x 415 x 0.85) = 48,913 / 610.98 = 80.06 Amps` ! Note: A Star-Delta or DOL motor draws **5x to 7x** locked-rotor starting current briefly; ensure upstream MCCB/starter and feeder voltage drop handle start cleanly!

HINGLISH

Connected load = poore board ke sabhi equipment ka kul kW jor. Full Load Current (FLA) = poora wajan dalne par motor dwara khincha jaane wala asli ampere.

Chapter 2: Cable Construction — Cu vs Al, PVC vs XLPE, Armoured vs FRLS

Decoding Cable Alphabet Soup on Site

Parameter Choice	Common Options	Engineering Reasoning & Best Placement
Conductor Metal	Copper (Cu) vs Aluminium (Al)	Copper handles higher current density per mm2 (~1.6x smaller area), bends cleanly inside tiny motor boxes, resists creep; Aluminium cuts heavy feeder cost cleanly above 25–35 mm2!
Insulation Polymer	PVC (70 C max) vs **XLPE (90 C max)**	XLPE carries ~20–25% higher continuous ampacity & better short-circuit thermal withstand (`250 C` peak vs `160 C` PVC!)—preferred for virtually all power mains
Mechanical Armour	Flat GI Wire / Strip Armoured (`AYFY` / `A2XFY`) vs Unarmoured	Underground trenches & exposed trays demand steel armour protection against impact/rodents
Fire Behaviour	Standard PVC vs **FRLS** vs **Fire Survival (FS)**	FRLS delays flame spread & cuts black smoke in shafts; **Fire Survival (mica-tape wrapped)** keeps power running *through* active fire for Fire Pumps, Smoke Fans & Fire Lifts!

FIELD TIP

Never bend a stiff multi-core XLPE armoured feeder tighter than manufacturer minimum bending radius (often **12x to 15x** overall cable outer diameter)—sharp 90-degree hammer bends inside panel cable boxes crack insulation internally!

Chapter 3: The 3-Step Cable Selection Method and Derating Factors

Why Datasheet Ampacity Numbers Shrink on Real Sites

Catalog manufacturer ampacity tables assume clean laboratory environments (e.g., single isolated cable resting in 30 C free air or 25 C cool soil). On crowded Indian MEP shaft trays packed tightly at 45 C summer ambient, heat cannot escape! Always execute **THREE independent checks** and pick the largest size required across all three:

1. **Check 1 — Derated Continuous Ampacity (`I_catalog x K_total >= I_design`)**
2. **Check 2 — Percentage Voltage Drop (`%dV <= code/project limit`)**
3. **Check 3 — Short-Circuit Thermal Withstand (`I^2 t <= k^2 S^2`)**

Derating Parameter	Why It Reduces Rating	Illustrative Typical Range *(Verify Vendor Sheet!)*
Ambient Air Temperature	Hot ceiling slabs / DG rooms cool slower	At 40 C air (~0.91 for 90 C XLPE; ~0.87 for 70 C PVC); at 45 C (~0.87 XLPE)
Grouping / Bunching Factor	Touching parallel cables trap mutual heat	2 touching circuits (~0.88), **3 touching (~0.79)**, 6 touching (~0.68) on perforated tray
Ground Depth & Soil Thermal Resistivity	Dry sandy soil blocks heat dissipation vs damp loam	Adjust strictly per cable OEM burial depth & spacing chart

WORKED EXAMPLE 1 (CONTINUED — DERATED FEEDER SELECTION)

Our 45 kW pump requires **80.1 A** FLA. Suppose feeder runs bundled inside a 40 C basement tray alongside 2 other loaded touching feeders (`3 circuits total -> K_group = 0.79` illustrative; `K_temp = 0.91` illustrative).

Combined Derating Factor `K_total = 0.79 x 0.91 = 0.719` . Required Minimum Base Catalog Rating = `80.1 A / 0.719 = 111.4 Amps` ! Check standard 3.5C/4C XLPE Armoured Aluminium cable in air datasheet (confirm OEM table!): typically `35 mm2 Al XLPE` sits around ~105–110 A in air (TOO CLOSE / borderline fail!), while **50 mm2 Al XLPE** sits cleanly around ~130–140 A -> Pick **50 mm2 Al XLPE** (or **25–35 mm2 Cu XLPE**)!

HINGLISH

Derating factor = garmi ya saath-saath bichi cables ki wajah se taar ki asli bijli jhelne ki kshamta ghatne wala hisaab.

Chapter 4: Voltage-Drop Calculation (mV/A/m Method) and Motor Starting Check

Amps Fit, Yet Pump Trips on Low Volts!

Passing current ampacity means cable won't melt—it does *not* prove voltage reaches the motor across a 180-metre basement run! Every manufacturer catalog prints a **mV/A/m** voltage-drop constant (millivolts dropped per Ampere per metre of 3-phase run—already accounting for both resistance and reactance cleanly!).

FORMULA

```
Delta_V (Volts) = (mV/A/m x I_load x Length_m) / 1,000  % Voltage Drop = (Delta_V / Nominal_Voltage_V) x 100  (Verify allowable drop against IS 732 / IEC 60364 / consultant spec—commonly ~3%–5% steady run across power feeders, checking motor starting surge doesn't pull terminal volts below starter contactor coil hold-in!).
```

WORKED EXAMPLE 2

Sub-Main Voltage-Drop Verification (Illustrative). Feed our **80.0 A** fire pump motor across a **120 m** trench run using **3.5C x 50 mm2 Aluminium XLPE** cable. Assume vendor 3-phase voltage drop constant `= 1.25 mV/A/m` *(verify exact OEM catalog figure!)*.

Step 1: Total Voltage Drop `Delta_V = (1.25 x 80 x 120) / 1,000 = 12,000 / 1,000 = 12.0 Volts`. Step 2: Percentage Drop at 415 V line-to-line: `%dV = (12.0 / 415) x 100 = 2.89%`. Verdict: **2.89% <= 3.0% / 5.0%** typical allowance -> **PASS!** (If length doubled to 240 m, `%dV` hits 5.78% -> would force stepping up cleanly to `70 mm2` or `95 mm2 Al` !). Also use the quick verifier at `sge.org.in/tools/cable-voltage-drop` anytime!

Chapter 5: Understanding 'kA' Rating on Breakers (Icu, Ics, Icw) and Fault Current

Why Main DB Breakers Need 35 kA / 50 kA While Floor MCBs Hold 10 kA

If a dead short occurs directly on your Main LT Panel busbar right beneath a 1,000 kVA transformer, thousands of amperes explode instantly! If an undersized `10 kA` breaker tries interrupting a `28 kA` arc, its arc chutes vaporise and panels catch fire.

Switchgear Parameter	Engineering Definition	What To Watch on Spec Sheets
Icu (Ultimate Breaking Capacity)	Highest fault kA breaker clears safely **once** before possibly failing permanently	Check it exceeds `Isc` cleanly
Ics (Service Breaking Capacity)	Fault kA breaker clears **repeatedly** and stays fully usable afterwards (often expressed as `%` of Icu, e.g., 100% or 75% Ics)	Specify **100% Ics = Icu** for critical Main & Fire incomers!
Icw (Short-Time Withstand)	kA an ACB holds closed smoothly for e.g. `1 second` waiting for downstream feeder breakers to trip selectively (**Discrimination**)	Essential on main Air Circuit Breakers (ACBs)

WORKED EXAMPLE 3

Transformer Prospective Short-Circuit Current (`Isc`) (Illustrative). A building runs off a **1,000 kVA**, `11 kV / 415 V` transformer having typical nameplate percentage impedance `%Z = 5.0%` (0.05 per unit). Assume conservative "infinite HT grid bus" (worst-case upper-bound fault current ignoring upstream utility impedance—check true IEC 60909 system impedance study for stamped industrial plants!).

Step 1: Transformer Full-Load Output Current `I_fl = (1,000 x 1,000) / (1.73205 x 415) = 1,391.2 Amps`. Step 2: Maximum Prospective Symmetric Fault Current at LT Terminal: `I_sc = I_fl / (%Z / 100) = 1,391.2 / 0.05 = 27,824 Amps = 27.82 kA` ! Selection Verdict: Selecting a standard `25 kA` breaker right next to a 1,000 kVA transformer is UNSAFE (`27.82 > 25`)! Pick minimum **35 kA or 50 kA** breaking rating on Main LT Panel Busbar, Incomer ACB, and first outgoing MCCBs! Farther downstream on small sub-DBs, feeder cable resistance naturally damps fault current down to < 6–10 kA.

HINGLISH

KA rating (Breaking Capacity) = short-circuit dhamake mein breaker bina phate kitne hazaar ampere ka current tod sakta hai. Infinite bus assumption = transformer ke muh par aane wala sabse bada mumkin fault current.

Chapter 6: Decoding 'K Factor' — Adiabatic Cable `k` vs Harmonic `K-Factor`

Solving Site Confusion Around "K Factor"

Engineers on Indian projects often mix up two **completely unrelated formulas** that both carry the letter `K`:

1. **Cable Adiabatic Short-Circuit Constant `k` (IS / IEC 60364 Check):** Measures whether your chosen cable cross-section `S (mm2)` survives peak fault heat before the breaker trips!

> **FORMULA**
> `I^2 x t <= k^2 x S^2 -> Or Minimum Area S_min (mm2) >= (I_fault x sqrt(t)) / k`
> *(Typical illustrative adiabatic `k` constants—verify IEC 60364 / BIS cable tables!: Copper PVC ~115, **Copper XLPE ~143**, Aluminium PVC ~76, **Aluminium XLPE ~94**).*

2. **Harmonic Transformer `K-Factor` (IEEE/IEC Harmonic Heating Rating):** Used when selecting step-down transformers feeding messy non-linear VFDs, UPS rectifiers, LED drivers, and IT server banks (`K-1` , `K-4` , `K-13` , `K-20`) where triplen harmonics overheat neutral and winding Eddy losses! Never enter transformer harmonic `K-13` inside cable `I2t` math!

> **WORKED EXAMPLE 4**
> Adiabatic Cable Withstand Check (`I^2 t <= k^2 S^2`) (Illustrative). Check our **50 mm2 Aluminium XLPE** feeder (`k = 94` illustrative) exposed to a downstream damped bus fault of `I_fault = 15,000 A` cleared by an MCCB/relay inside `t = 0.10 seconds` :
>
> Step 1: Fault Let-Through Energy `I^2 x t = (15,000)^2 x 0.10 = 225,000,000 x 0.10 = 22,500,000 A^2s` (`2.25 x 10^7`). Step 2: 50 mm2 Al XLPE Cable Thermal Limit `k^2 x S^2 = (94)^2 x (50)^2 = 8,836 x 2,500 = 22,090,000 A^2s` (`2.21 x 10^7`). Verdict: **2.25e7 slightly EXCEEDS 2.21e7!** At 0.10 s trip delay, a sustained 15 kA arc chars 50 mm2 insulation! Fix Options: Either use current-limiting fast trip breaker cutting `I^2t` (< 0.05 s) **OR** step cable cleanly up one size to **70 mm2 Al XLPE** (`94^2 x 70^2 = 4.33 x 10^7 A^2s` -> **SAFE PASS!**).

> **HINGLISH**
> Adiabatic withstand check = breaker band hone se pehle unchhe millisecond mein short-circuit ki aag se cable pighal toh nahi jayegi, yeh verify karna!

Chapter 7: LT Panel Anatomy, Busbar Current Density and Switchgear Coordination

Inside a Credible IEC 61439 LT Panel

Inspect every factory-built Main LT Panel at OEM works (FAT — Factory Acceptance Test) prior to dispatch:

- **Enclosure & IP Rating:** CRCA sheet (typically 1.6–2.0 mm frames/doors), powder-coated, gasketed >= IP42 indoors / >= IP54–55 damp pump rooms!
- **Busbar Sizing & Clearance:** Insulated heat-shrink colour sleeves (Red, Yellow, Blue, Black Neutral), high-tensile DMC/SMC insulators spaced cleanly to hold `35 kA / 50 kA` magnetic short-circuit wrenching forces! Typical conservative design busbar current density guidance runs around ~ `0.8–1.0 A/mm2` for **Aluminium** and ~ `1.2–1.6 A/mm2` for **Electrolytic Copper**—confirm full temperature-rise testing against **IEC 61439**!
- **APFC Capacitor Bank Steps:** Staged detuned reactor capacitor steps maintaining `>= 0.98–0.99` lagging power factor avoiding utility kVAh surcharge penalties!
- **Selectivity / Discrimination:** Main ACB trips slightly delayed (`0.2–0.4 s` short-time) relative to instant downstream floor MCCBs so one burning toaster on Floor 3 trips ONLY Floor 3 DB—leaving all other 12 floors powered safely!

Chapter 8: Earthing Conductors, Glanding, Terminations and Pre-Energisation Tests

Bad Terminations Start More Panel Fires Than Cable Core Faults

1. **Double-Compression Brass Glands & Crimped Bimetallic Lugs:** Never connect raw Aluminium cable directly onto Copper breaker studs using plain copper lugs—galvanic oxidation builds fierce contact heat! Use **Bimetallic Al-Cu lugs**, proper hydraulic hex crimping, and torque wrenches cleanly!
2. **Armour Continuity & Dedicated Earth Bar:** Bond cable armour clamping cones cleanly onto internal GI/Cu earth busbar wired back to dual tested earth pits per **IS 3043** (verify `sge.org.in/tools/electrical-earthing` calculations cleanly!).
3. **Insulation Resistance (IR / Megger) Test Before Closing Breakers:** Disconnect delicate electronic meters/VFD boards first -> apply rated DC test volts (e.g., 500 V / 1000 V DC for 415 V cables per BIS code) between `R–Y` , `Y–B` , `B–R` , and all phases-to-Earth (`>> 100 M–Ohm` typical on new healthy cable!).

WARNING

Isolate incomer breakers physically, apply **Lockout-Tagout (LOTO)** locks, discharge residual cable capacitance safely, wear Arc-Flash / Class-0 insulated gloves & face shield, and verify dead lines with a calibrated CAT III/IV voltmeter before any panel termination! Licensed electrical personnel only.

HINGLISH

Bimetallic lug = aluminium taar ko copper patti se bina zang lagaye jodne wala do-dhatu lug. Loose termination = dheela nut-bolt jo garm hokar panel mein aag lagata hai.

Chapter 9: End-to-End Feeder Worked Example, Cable Schedule and Panel Templates

Printable Feeder Cable Schedule Template

Feeder ID & Panel	Load Name & Rated kW/kVA	Running FLA (A)	Cable Size & Type	Run Length (m)	Derating Factor	Voltage Drop (%)	Breaker Rating & kA	IR Test (M-Ohm) & Sign
`FD-01` (Main LT)	Hydrant Pump #1 (45 kW)	80.1 A	3.5C x 70 mm2 Al XLPE Arm	120 m	0.72	2.1%	125 A MCCB (36 kA)	____ M-Ohm / _____
`FD-02` (Main LT)	Jockey Pump #1 (5.5 kW)	~10.8 A	4C x 4 mm2 Cu XLPE Arm	35 m	0.80	1.4%	25 A MCCB (25 kA)	____ M-Ohm / _____

Pre-Energisation LT Panel Inspection Checklist

- ☐ Phase colours `R-Y-B-N` and distinct green/copper Earth bar cleanly labelled across chambers.
- ☐ All busbar & lug nut-bolts checked for torque witness paint marks.
- ☐ All CT (Current Transformer) secondary terminals **shorted cleanly if un-connected to ammeters** (open energized CT secondary builds lethal thousands of volts!).
- ☐ Cable glands tight; unused gland plates sealed cleanly against rats and snakes!
- ☐ Dedicated rubber **IS 15652 Electrical Insulating Mat** laid neatly directly in front of full panel length!

Chapter 10: Formula Cheat Sheet, FAQ and Hinglish Electrical Glossary

LT Electrical Designer's Pocket Formulas

- **3-Phase Amps:** `I = P_watts / (1.732 x V x pf x eff)`
- **Voltage Drop:** `dV = (mV/A/m x I x L) / 1,000` -> Keep `<= 3-5%`
- **Fault kA at Transformer:** `Isc_kA = I_fl_kA / (%Z / 100)`
- **Cable Short-Circuit Check:** `I_fault^2 x t_clear <= k^2 x S_mm2^2`

Frequently Asked Questions (Site Electrical & Panels)

1. **Why do electrical specifications use 3.5-Core cable instead of 4-Core for heavy balanced 3-phase motors/sub-mains?** A 3.5-core cable provides three equal heavy phase conductors (R, Y, B) plus one **half-size neutral**—cutting copper/aluminium weight cleanly on feeds carrying light unbalanced neutral current! Where heavy single-phase LED/UPS harmonic currents run (e.g., server UPS feeders), specify **Full 4-Core** or **oversized Neutral** so the neutral never melts!

2. **Is a 10 kA MCB safe inside a Sub-DB right next to a 1,000 kVA transformer room?** Usually **NO** unless protected cleanly upstream by a tested cascading current-limiting MCCB per manufacturer backup charts! Always check short-circuit fault decay across cable impedance first.
3. **Why did a transformer-room MCCB trip cleanly on overload when motor current looked normal?** Loose terminal screws on the outgoing brass lug heated up the internal thermal bimetallic strip artificially! Check terminal tightness with a thermal imaging camera quarterly.
4. **What is the difference between a Switchboard's `Icu` and `Ics`?** Treat `Ics` as the "survives to serve tomorrow" rating; always prefer 100% Ics = Icu on critical fire and main panels so a downstream short doesn't force replacing an expensive main breaker immediately!
5. **Can we tie Fire Pump cables onto common Main Lighting cable trays?** No! Fire pump essential cables should use **Fire Survival (FS) cable** along dedicated fire-protected separated routes wired upstream of general building main isolators!
6. **Why do aluminum cables require spring washers & bimetallic lugs inside copper busbars?** Aluminum cold-flows gently under heat cycles and oxidizes immediately on bare contact with copper—causing loose high-resistance fires without proper Belleville/spring washers and anti-ox bimetallic interfaces.
7. **What does 'Type 2 Coordination' mean on a Motor Starter feeder?** Means following a short circuit, contactor and overload relay suffer zero permanent contact welding—allowing staff to reset cleanly after clearing fault! Compare strictly against cheap Type 1 where contactor blows apart.
8. **How fast should my Earth Pit resistance measure?** Check **IS 3043** and equipment vendor specs—general grid/substation grids commonly target <= 1 to 2 Ohms (low enough to blow protective breakers rapidly cleanly). Cross-check pit counts at `sge.org.in/tools/electrical-earthing`!
9. **Can we use single-core armored cables through three separate holes on a steel steel gland plate? NO!** Passing single-core AC cables individually through steel plates induces fierce **Eddy Current heating** cutting steel red-hot! Mount single-core cables through **Non-Magnetic Brass / Aluminium Gland Plates** strictly!
10. **Why did my Main LT panel trip on Earth Fault during monsoon?** Sump water wicking inside damp outdoor garden bollard joints, or corroded neutral-earth bond confusion downstream of an RCCB.
11. **What should `CT` shorting links be set to during commissioning?** Remove shorting link ONLY after confirming ammeter/multifunction meter wiring is solidly clamped onto CT `S1/S2`! Never pull meter wires off a live loaded circuit!
12. **How often should LT Panel thermography and torque checks be conducted?** Annually (or semi-annually on heavy factories/hospitals) using a calibrated infrared thermal camera while panels run under normal load!

Hindi–English Bilingual Glossary

English Term	Hinglish / Site Hindi	Field Meaning
Full Load Current (FLA)	Poore bhar par bijli ampere	Nameplate amps drawn at rated 100% power
Demand / Diversity Factor	Ek saath chalne ka anupat	Realistic operating fraction vs connected total
Power Factor (pf)	Bijli upyog kshamta anupat	Cosine ratio between active kW and apparent kVA
Voltage Drop	Taar ki lambai se voltage ghatna	Line loss reducing end terminal volts
Derating Factor	Garmi/jhund se kshamta ghatna	Multiplier shrinking nominal catalog cable amps
XLPE Insulation	Garmi jhelne wali pakki rubber	Cross-linked polyethylene rated to 90 C
FRLS Cable	Kam dhuen wali tar	Flame-retardant low-smoke fire-safe jacket
Fire Survival (FS) Cable	Aag mein bhi chalti rehne wali taar	Mica-tape wrapped armored cable surviving flame
Breaking Capacity (kA / Icu)	Fault dhamaka todne ki taqat	Max short-circuit kiloamperes breaker safely cuts
Prospective Fault Current (Isc)	Transformer ke paas aane wala sabse tez fault	Maximum theoretical arc current at %Z
Adiabatic Check (`I2t`)	Pal bhar ke fault mein taar na galne ki janch	Formula verifying cable area survives trip delay
Harmonic K-Factor	Non-linear load ke liye transformer rating	Heating factor for UPS/VFD distorted currents
Busbar Chamber	Taambe/Aluminium ki mukhya patti	Central thick flat bars splitting power to feeders
Discrimination / Selectivity	Sirf kharab hisse ka breaker girna	Timing cascade protecting unaffected floors
Bimetallic Lug	Do-dhatu jodne wali patti/cap	Friction-welded Al-to-Cu connector stopping rust
Double Compression Gland	Do layer kasne wala pital ka seal	Grips both cable armour & outer jacket firmly
Non-Magnetic Gland Plate	Aluminium/Pital ki patti	Required for single-core cables stopping Eddy heat
Current Transformer (CT)	Ampere naapne wali gol ring	Step-down coil feeding panel ammeters safely
Insulation Resistance (Megger)	Taar ki leak naapne ka parikshan	DC high-volt resistance proving zero short/moisture
APFC Panel	Power factor sudharne wala board	Switched capacitor banks stopping kVAh penalties
MCCB / ACB	Bada / Mukhya bijli breaker	Molded-case & Air Circuit Breakers
RCCB / ELCB	Current leak par turant band switch	Residual current breaker saving human electrocution
Torque Wrench	Naap kar bolt kasne wala paana	Tightens busbars cleanly avoiding loose hotspots
Insulating Rubber Mat	Panel ke aage bichhane wali suraksha chatai	High-voltage dielectric safety runner (IS 15652)

English Term	Hinglish / Site Hindi	Field Meaning
Thermography Audit	Heat camera se garam jod dhoondhna	Non-contact IR scan revealing loose lugs early
LOTO (Lock Out Tag Out)	Kaam karte samay tala aur parchi	Mandatory energy isolation lock during servicing

Cable Sizing, LT Panel & Short-Circuit (kA) Guide

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COMPLETE 12-VOLUME SGE ENGINEERING LIBRARY

01 Fire Fighting System A to Z
02 Fire Protection Design Handbook
03 The Fire Pump House Manual
04 Pressure Switch & Pump Controller Field Manual
05 Sprinkler System Design Workbook
06 Fire Alarm Design & Cable Calculation Guide
07 Special Hazard Suppression Guide
08 Fire NOC & Building Approval Playbook
09 Fire Extinguishers, Home & Office Safety
10 **Cable Sizing, LT Panel & Short-Circuit (kA) Guide**
11 HT Cable Hi-Pot Testing & Fault Location
12 The Site Engineer's Calculation Handbook

Need This Executed or Audited on Your Site?

Shree Ganesh Enterprises (SGE) designs, supplies, installs, tests, commissions, and maintains Fire Fighting, Addressable Fire Alarm, HT/LT Electrical, Plumbing, HVAC, and IBMS systems — backed 24×7 by AMC MEP 24x7.

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