TYPE · PUR-SHEATHED REELING CABLE · MINING & TUNNELLING MACHINES | 0.6/1 kV | 12 VARIANTS

EQUIVALENT TO TROMMELFLEX-M-PUR | INDIA EDITION

FC-TPU-M D2X11Y 0.6/1 kV

Halogen-free PUR-sheathed reeling cable for cable reels on drill rigs and load-haul-dump machines in underground mines and tunnels — XLPE-insulated cores, split protective earth conductor, compact and lightweight.

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01 Application and product overview

FC-TPU-M D2X11Y is a compact, lightweight reeling cable with a polyurethane (PUR) outer sheath. It is designed for the cable reels of electric drill rigs, bolting rigs and load-haul-dump (LHD) machines in underground mines and tunnels.

The XLPE-insulated main cores are stranded with a very short lay length together with the split protective conductor and, on request, two control cores. The halogen-free inner sheath and the tough, flame-retardant PUR outer sheath give high resistance to abrasion, cuts, tearing and water.

Typical applications

- Electric drill rigs, drilling jumbos and bolting rigs in underground mines and tunnels
- Load-haul-dump (LHD) machines and loaders fitted with cable reels
- Self-propelled equipment in wet workings — water-resistant to 10 m immersion depth
- Tunnelling projects — metro, hydropower, road and rail tunnels — where halogen-free cables are specified
- Underground hard-rock and mineral mines

12 variants
Power cores 25 – 240 mm²

20 N/mm²
Max. tensile load on power-core copper

60 m/min
Max. travelling speed (reeling)

Halogen-free
Flame-retardant PUR outer sheath

Equivalent type

REFERENCE TYPE		FEICHUN EQUIVALENT
TROMMELFLEX-M-PUR D2X11Y 0.6/1 kV	⇄	**FC-TPU-M D2X11Y 0.6/1 kV**

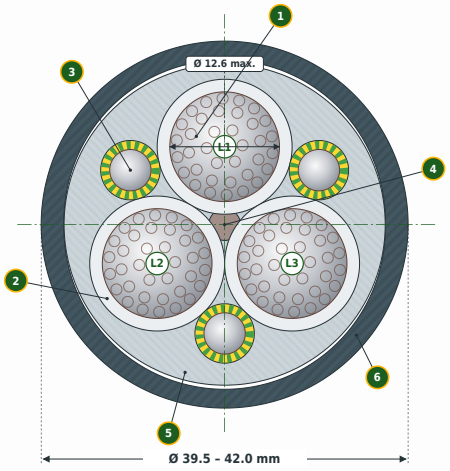
FC-TPU-M D2X11Y 0.6/1 kV corresponds to TROMMELFLEX-M-PUR D2X11Y 0.6/1 kV in construction and dimensions. See Section 11 for the trademark notice.

02 Suitability for Indian operating conditions

The table relates typical conditions at Indian underground mines, tunnels and surface sites to the properties of FC-TPU-M. All values come from the technical data in Sections 3 to 6.

Operating condition	Relevant property of FC-TPU-M
High ambient temperature and humidity	Conductor temperature up to +90 °C; ambient −30 °C to +80 °C in moving use. Current ratings at 40 °C ambient are given in Section 6.
Wet workings, seepage, monsoon ingress	Water-resistant PUR sheaths; maximum immersion depth 10 m.
Rough rock, abrasion, impact and tearing	Outer sheath of halogen-free PUR resistant to abrasion, cuts and tearing.
Frequent reeling duty	Up to 60 m/min; very short lay length; minimum bending radius 8 × D on the reel; torsion up to ±50 °/m.
Confined spaces and tunnels	Insulation, inner sheath and outer sheath are halogen-free; flame propagation tested to IEC 60332-1-2.
Sunlight at portals and open sites	UV- and ozone-resistant.

03 Construction



Section A–A · FC-TPU-M D2X11Y 0.6/1 kV · base size 3×95 mm² · Doc. FC-TDS-TMP-2026-9238-IN · Rev. 0 · 2026-10-30 · first-angle projection · not to scale. Optional control cores are not shown; other sizes differ in proportions.

Item	Element	Material
1	Conductor	Bare annealed copper, finely stranded, class 5 (IEC 60228)
2	Insulation	Cross-linked polyethylene (XLPE), 90 °C; core colours brown, black, grey
3	Protective (earth) conductor	Split into three parts (3G), green-yellow, in the interstices
4	Central filler	Halogen-free filler
5	Inner sheath	Halogen-free polymer compound
6	Outer sheath	Halogen-free polyurethane (PUR), flame-retardant, resistant to abrasion, cuts and tearing

Construction details

Element	Description
Conductor	Finely stranded bare annealed copper, class 5 to DIN EN 60228 / IEC 60228 / VDE 0295
Core insulation	Cross-linked polyethylene (XLPE), reference IEC 60502-1; operating temperature 90 °C
Core identification	Main cores brown, black, grey to DIN VDE 0298-300; control cores blue and white
Protective conductor	Protective conductor split into three parts (3 G x), green-yellow, laid in the interstices
Control cores	Optional: two control cores (2 × 1 or 2 × 1.5 mm²) in the interstices; combined design with 2 × (10 × 2.5) control bundles and one screened (C) bundle 8 × 1.5 mm²

04 Electrical, thermal and mechanical data

Electrical

Parameter	Value
Rated voltage U_0/U (U_m)	0.6/1 (1.2) kV AC
Max. operating voltage, DC	0.9/1.8 kV
Test voltage	2.5 kV AC (power cores); 2 kV AC (control cores)
Current ratings	To DIN VDE 0298-4 at 30 °C ambient; 40 °C values in Section 6

Thermal and mechanical

Parameter	Value
Max. conductor temperature	+90 °C
Max. short-circuit temperature	+250 °C
Ambient, fixed installation	−40 °C to +80 °C
Ambient, moving use	−30 °C to +80 °C
Min. bending radius	4 × D fixed; 8 × D on cable reel (DIN VDE 0298-3)
Max. tensile load	20 N/mm² continuous, based on total copper cross-section of the main cores
Max. torsion	±50 °/m
Max. travelling speed	60 m/min (underground reeling)
Flame propagation	DIN EN 60332-1-2 / IEC 60332-1-2
Halogen-free	Yes (insulation, inner and outer sheath)
UV and ozone resistance	Resistant
Max. immersion depth	10 m

Ambient temperature factors

Ambient °C	20	25	30	35	40	45	50
Factor	1.08	1.04	1.00	0.96	0.91	0.87	0.82

Conductor temperature 90 °C; reference ambient 30 °C.

Short-circuit current withstand

Permissible short-circuit current for 1 s: $I_k = 0.143$ kA/mm² × conductor cross-section (XLPE insulation, copper, 90 °C → 250 °C). For another duration t: $I_{k,t} = I_{k,1\,s} / \sqrt{t}$ (0.1 s ≤ t ≤ 5 s).

05 International standards and testing

Standard	Scope
DIN EN 60228 / IEC 60228 / VDE 0295	Conductors of insulated cables, class 5
IEC 60502-1	Reference for the XLPE insulation compound
DIN VDE 0298-300	Application of cables — core identification
DIN VDE 0298-3	Application of cables — bending radii, tensile load
DIN VDE 0298-4	Current-carrying capacity
DIN EN 60332-1-2 / IEC 60332-1-2	Flame propagation, single cable

Routine and type tests

- AC voltage test on every drum length
- Conductor resistance and dimensional checks
- Continuity of protective and control cores
- Reeling, bending and torsion tests (type test)
- Flame propagation (IEC 60332-1-2) and halogen-free verification

Test documentation: every shipment is accompanied by a FeiChun in-house laboratory test certificate. Third-party witnessed testing can be arranged at the buyer's expense.

06 Dimensions, weights and ratings — 0.6/1 kV (12 variants)

Table 6A — Dimensions, weight and mechanical limits

Type designation cores × mm²	FeiChun article no.	Conductor Ø max. mm	Outer diameter min. mm	Outer diameter max. mm	Min. bending radius mm	Weight approx. kg/km	Max. tensile force N
Three power cores + split protective conductor + two control cores							
3×25+3G6+2×1	FC-TMP-001	6.2	22.5	24.0	192	1,130	1,500
3×35+3G6+2×1.5	FC-TMP-002	7.8	26.5	28.0	224	1,530	2,100
3×50+3G10+2×1.5	FC-TMP-003	9.6	30.0	32.0	256	2,160	3,000
3×70+3G16+2×1.5	FC-TMP-004	11.1	35.0	37.0	296	3,050	4,200
3×95+3G16+2×1.5	FC-TMP-005	12.6	39.5	42.0	336	3,690	5,700
3×120+3G25+2×1.5	FC-TMP-006	14.8	44.0	46.5	372	4,810	7,200
3×150+3G25+2×1.5	FC-TMP-007	16.0	49.0	52.0	416	5,780	9,000
3×185+3G35+2×1.5	FC-TMP-008	17.7	53.5	56.0	448	7,300	11,100
3×240+3G50+2×1.5	FC-TMP-009	20.2	61.5	64.5	516	9,600	14,400
Four-core							
4×50	FC-TMP-010	9.6	33.0	35.0	280	2,450	4,000
4×70	FC-TMP-011	11.1	38.1	40.6	325	3,300	5,600
Combined design: power + control cores (screened control bundle)							
4G70+2×(10×2.5)+ 1×(8×1.5)C	FC-TMP-012	11.1	62.0	66.0	528	5,300	5,600

Bending radius 8 × D on the reel. Tensile force = 20 N/mm² × total main-core copper cross-section. Weights and dimensions are approximate; other sizes on request.

Table 6B — Electrical ratings

Type designation cores × mm²	FeiChun article no.	R_{20} max. Ω/km	Current rating (free air) at 30 °C A	Current rating (free air) at 40 °C A	Short-circuit current kA (1 s)
Three power cores + split protective conductor + two control cores					
3×25+3G6+2×1	FC-TMP-001	0.780	131	**119**	3.57
3×35+3G6+2×1.5	FC-TMP-002	0.554	162	**147**	5.00
3×50+3G10+2×1.5	FC-TMP-003	0.386	202	**184**	7.15
3×70+3G16+2×1.5	FC-TMP-004	0.272	250	**228**	10.01
3×95+3G16+2×1.5	FC-TMP-005	0.206	302	**275**	13.58
3×120+3G25+2×1.5	FC-TMP-006	0.161	352	**320**	17.16
3×150+3G25+2×1.5	FC-TMP-007	0.129	404	**368**	21.45
3×185+3G35+2×1.5	FC-TMP-008	0.106	461	**420**	26.45
3×240+3G50+2×1.5	FC-TMP-009	0.0801	540	**491**	34.32
Four-core					
4×50	FC-TMP-010	0.386	202	**184**	—
4×70	FC-TMP-011	0.272	250	**228**	—
Combined design: power + control cores (screened control bundle)					
4G70+2×(10×2.5)+1×(8×1.5)C	FC-TMP-012	0.272	250	**228**	—

30 °C ratings follow DIN VDE 0298-4 (flexible rubber-type cables, free air). 40 °C rating = 30 °C rating × 0.91 (factor in Section 4), rounded to the nearest ampere; 40 °C is a common design ambient in Indian project specifications. Multi-layer reel winding and grouping need further derating — contact FeiChun engineering.

07 Indian standards, approvals and regulatory notes

The Indian standards below are listed for orientation when an Indian tender or mine specification refers to them. FC-TPU-M is manufactured to the international standards in Section 5; conformity to the Indian standards below is **not** claimed in this document.

Indian standard	Title	Relation to FC-TPU-M
IS 14494:2019	Elastomer insulated flexible cables for use in mines — Specification	Indian reference standard for mine flexible and trailing cables with elastomer insulation and sheath. FC-TPU-M uses XLPE insulation and PUR sheaths.
IS 9968 (Part 1):1988	Elastomer insulated cables for working voltages up to and including 1100 V	Reference for elastomer-insulated flexible cables in the 1100 V class.
IS 7098 (Part 1):1988	Cross-linked polyethylene insulated PVC sheathed cables for working voltages up to and including 1100 V	Reference for XLPE-insulated cables with PVC sheath; FC-TPU-M has a PUR sheath.
IS 8130	Conductors for insulated electric cables and flexible cords	Indian standard for conductor classes; FC-TPU-M conductors are class 5 to IEC 60228.

BIS certification (ISI mark): under the Cables (Quality Control) Order, 2020, which came into force on 1 August 2020, many cable types sold or imported into India require BIS certification. Whether a particular construction falls under the Order depends on the notified Indian standard and the cable's design, so importers should confirm applicability with BIS or their customs broker before ordering. This document does not claim a BIS licence for FC-TPU-M. Information: www.bis.gov.in.

DGMS approval: electrical cables for use in underground coal mines in India are generally subject to approval by the Directorate General of Mines Safety (DGMS) under the Coal Mines Regulations. This document does not claim DGMS approval for FC-TPU-M. For other mines and for tunnelling projects, requirements follow the applicable regulations and the project specification. Mine-specific approvals are handled together with the end user or the local distributor; FeiChun supplies certificate copies and technical documentation on request. Information: www.dgms.gov.in.

Selection note — 1.1 kV (1100 V) systems: FC-TPU-M is rated 0.6/1 (1.2) kV. Indian underground installations also use 1.1 kV-class supplies, and tenders for these often specify a 1.1 kV-grade cable. For nominal 1.1 kV systems, please consult FeiChun engineering before selecting this type.

08 Installation, marking and supply

Installation guidelines

- Use a motor-driven or spring-driven cable reel with a core diameter of at least 2 × the minimum bending radius (8 × D).
- Unwind from the transport drum tangentially — never pull over the flange; avoid loops and kinks.
- Keep torsion within ±50 °/m and tensile force within the tabulated value.
- Suitable for wet conditions and temporary immersion to a depth of 10 m.
- Protect the cable against being driven over or crushed by machinery; inspect the sheath regularly.
- Connect all parts of the protective conductor at both ends.

Sheath marking

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FEICHUN FC-TPU-M D2X11Y [size] 0.6/1 kV [year] [serial no.] [metre mark]
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Packing and supply

Item	Standard
Drum	Steel or fumigated wooden drums; cable ends sealed with heat-shrink caps. Wood-packaging fumigation records can be provided with the shipping documents.
Lengths	On request, in one continuous length without joints
Lead time	2–3 weeks after technical agreement, plus sea freight to the Indian port of discharge
Delivery terms	FOB, CIF or DAP, by agreement
Warranty	At least 3 years against manufacturing defects
Drum label	Type, size, length, gross/net weight, batch no., drum no., country of origin

Ordering example: FC-TPU-M D2X11Y 3×95+3G16+2×1.5 0.6/1 kV — article no. FC-TMP-005 — length in metres per drum, to be stated in the enquiry.

09 Certification and quality

CE — LVD 2014/35/EU

Certificate no. M.2025.206.C116598 · EN 50525-1:2011+A1:2022 · UDEM International Certification · valid until 1 April 2030

UKCA — verification

No. ICR/VC/HS2508110 · BS EN 50525-1:2011+A1:2022 · ICR Polska · valid until 17 August 2030

India — BIS / DGMS

Not claimed in this document. See Section 7 for the regulatory notes and how project-specific approvals are handled.

FeiChun also holds documentation verification for ATEX (Directive 2014/34/EU) and IECEx / VDE approvals for certain product groups. Copies of certificates are available on request.

10 Frequently asked questions

Which cable is the equivalent of TROMMELFLEX-M-PUR D2X11Y 0.6/1 kV?

FC-TPU-M D2X11Y 0.6/1 kV from FeiChun Cables corresponds to TROMMELFLEX-M-PUR D2X11Y 0.6/1 kV in construction and dimensions (Section 1). The comparison is technical only.

What are the speed and tensile limits for reeling duty?

Maximum travelling speed is 60 m/min, maximum tensile load 20 N/mm² of total main-core copper, torsion ±50 °/m, and the minimum bending radius on the reel is 8 × D.

What current can a 3×95+3G16+2×1.5 cable carry at 40 °C ambient?

The free-air rating is 302 A at 30 °C and 275 A at 40 °C (Table 6B). Multi-layer reel winding and grouping require additional derating.

Is FC-TPU-M suitable for 1.1 kV (1100 V) supplies?

The cable is rated 0.6/1 (1.2) kV. For nominal 1.1 kV systems, consult FeiChun engineering before selecting this type (Section 7).

Does FC-TPU-M carry the BIS ISI mark or DGMS approval?

This datasheet does not claim either. Requirements depend on the construction, the notified Indian standard and the mine or project concerned; see Section 7.

11 Trademark notice and intellectual property

TROMMELFLEX® and the type designation TROMMELFLEX-M-PUR D2X11Y 0.6/1 kV identify a reference product of Prysmian Group, the trademark owner. They are used solely for technical comparison; FeiChun Cables is not affiliated with, or endorsed by, the trademark owner. FC-TPU-M is a FeiChun product developed with equivalent functional characteristics.

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