TROMMELFLEX PUR-HF | D12Y11YU11Y | TROMMELFLEX-M-PUR | D2X11Y | BRAIDED | 0.6/1 kV

TROMMELFLEX-PUR — Complete Halogen-Free PUR Reeling Cable Series

A professional engineering guide to the black industrial PUR-HF reeling family and the yellow underground-mining M-PUR designs, including 56 current specification records, detailed construction diagrams, the aramid-reinforced braided branch, legacy Part-number mapping, water duty, calculations and failure analysis.

30 PUR-HF rows | 12 M-PUR rows | 14 braided rows | 56 current records | 9 legacy Part numbers | 5 engineering diagrams

Rated voltage	Highest tensile rule	Highest reference speed	Maximum published water depth
0.6/1 kV	**25 N/mm²**	**180 m/min+**	**50 m**
		PUR-HF; consult above	PUR-HF only

Contents

1. Source hierarchy
2. Applications
3. PUR-HF cross-section
4. M-PUR braided cross-section
5. Family comparison
6. Electrical and thermal limits
7. PUR-HF 30-row matrix
8. M-PUR 12-row matrix
9. Braided 14-row matrix
10. Revision comparison
11. Braided dimensional effect
12. Calculations
13. Audit
14. Selection
15. Installation
16. FMEA

1. Source hierarchy and counting rule

Current PUR-HF brochure
Current construction, performance limits, Part numbers and the complete 30-row matrix.

Current mining/tunnelling brochure
Current 12-row M-PUR matrix and 14-row braided matrix, including aramid reinforcement.

Legacy M-PUR product sheet
Nine historical Part numbers and the earlier current-carrying values for revision comparison.

Derived data
Short-circuit current for current M-PUR rows is calculated by main conductor section and marked in blue.

Counting rule: the article contains 56 current published specification records. The nine legacy M-PUR Part numbers identify constructions already present in the current matrix and are therefore not counted as additional rows.

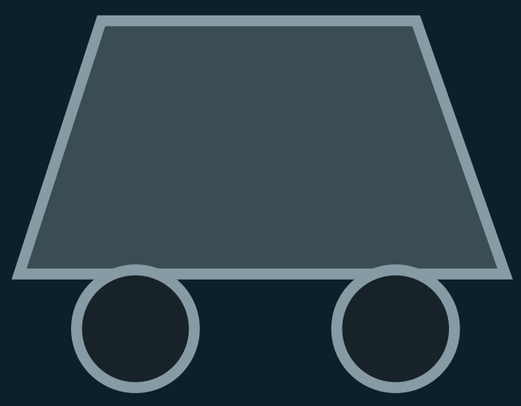
2. Application architecture

TROMMELFLEX-PUR application architecture



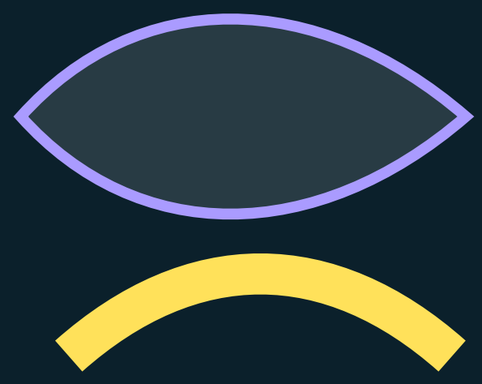
Crane and industrial reeling

TROMMELFLEX PUR-HF



Drills, scoops and LHDs

TROMMELFLEX-M-PUR



Higher-tension braided duty

Aramid carrier + reinforcement braid

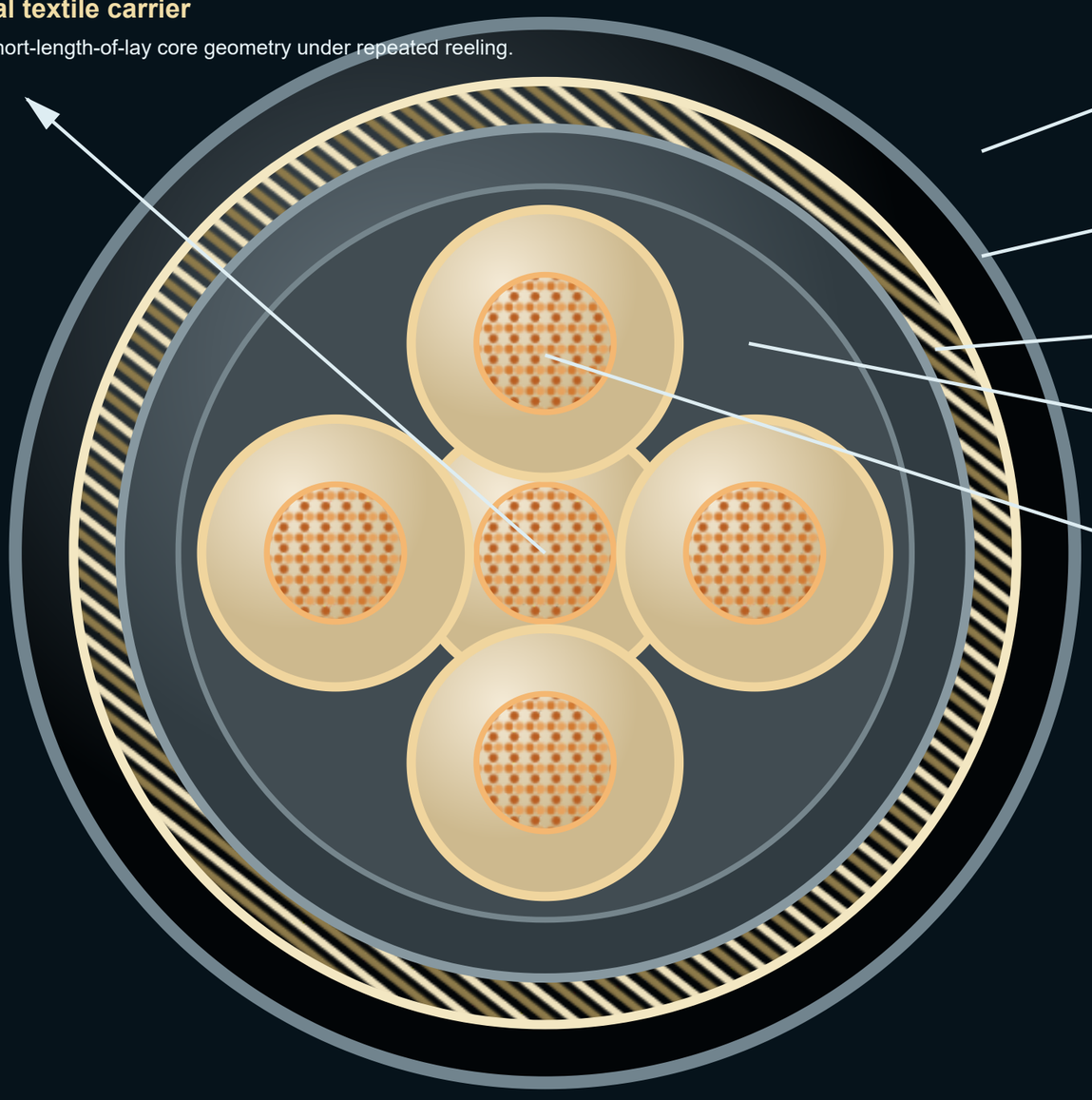
3. TROMMELFLEX PUR-HF detailed construction

TROMMELFLEX PUR-HF D12Y11YU11Y — detailed reeling-cable cross-section

Representative four-core design; relative wall thicknesses are engineering illustration only.

6. Central textile carrier

Supports short-length-of-lay core geometry under repeated reeling.



1. Black polyurethane outer sheath

Halogen-free, flame-retardant and opaque.

2. Open support braid

Torsion-protection and load-distribution layer.

3. Halogen-free PUR inner sheath

4. Polyester-based insulation

Halogen-free compound around each flexible core.

5. Plain copper, class 5

Published operating envelope

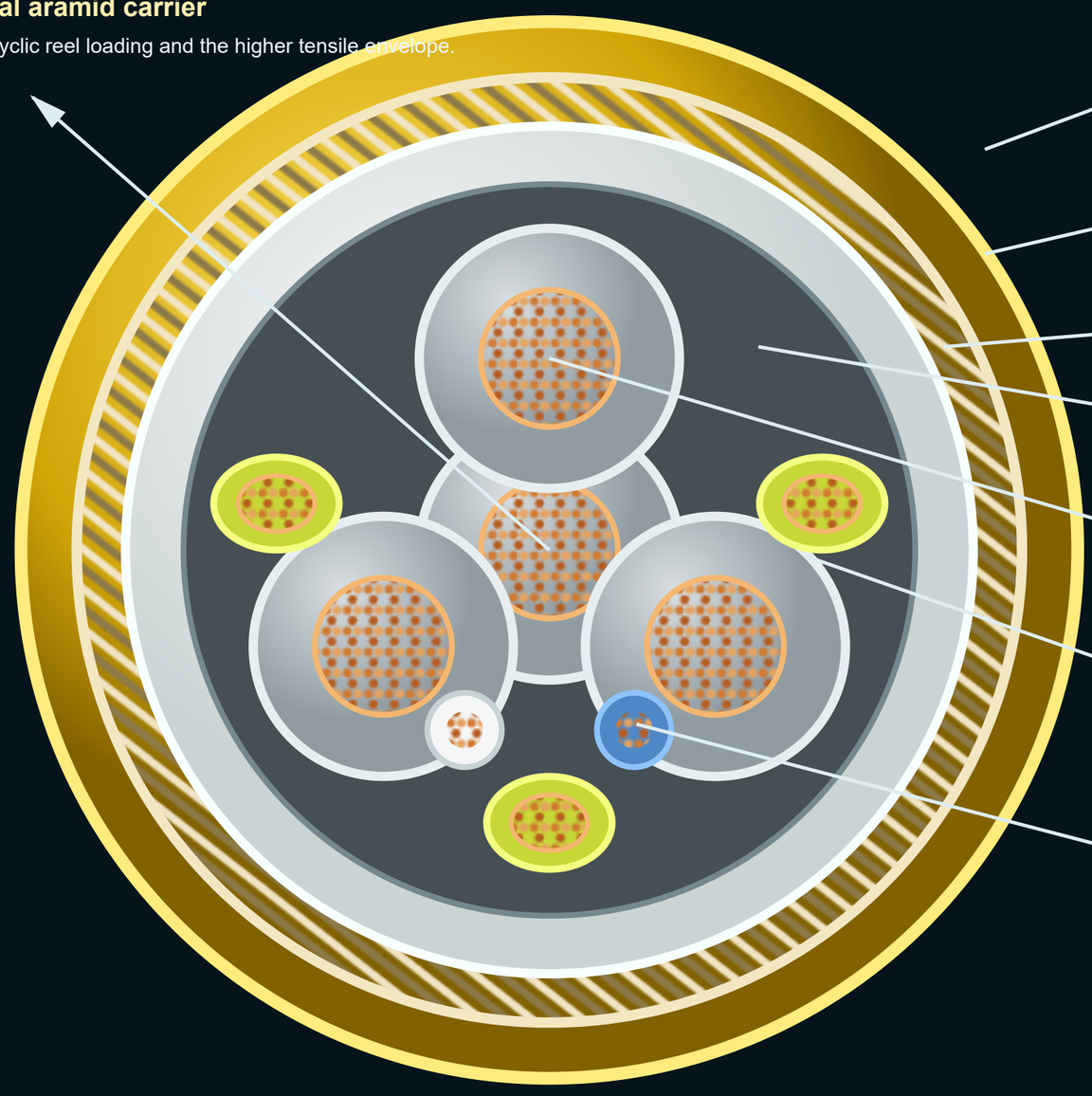
25 N/mm² conductor load · ±50°/m torsion · 6D moving radius · fully flexible −40…+80°C · permanent non-potable water duty to 50 m.

Construction principle: plain class-5 copper cores with polyester-based halogen-free insulation are laid around a central textile carrier. Halogen-free PUR inner and outer sheaths are separated by an open support braid.

4. TROMMELFLEX-M-PUR BRAIDED detailed construction

TROMMELFLEX-M-PUR BRAIDED D2X11Y — underground reeling cross-section

Representative 3C + split-earth + control-core design with central aramid carrier.



Published operating envelope

25 N/mm² · ±50°/m · 8D reeling radius · 100 m/min underground reeling · fully flexible −30…+80°C · maximum water depth 10 m.

Construction principle: three XLPE-insulated phase conductors, split protective-earth sections and optional control cores are laid around a central aramid carrier. A reinforcement braid raises the tensile and speed envelope relative to unbraided M-PUR.

5. The three constructions must remain separate

Three PUR constructions — limits are not interchangeable

PUR-HF

Black PUR inner and outer sheath

Polyester-based insulation

25 N/mm² · 6D · ±50°/m

180 m/min reference

50 m permanent water duty

30 specification rows

M-PUR unbraided

Yellow PUR outer sheath

XLPE insulation

20 N/mm² · 8D · ±50°/m

60 m/min underground reeling

10 m water depth

12 current rows

M-PUR BRAIDED

Central aramid carrier

Reinforcement braid

25 N/mm² · 8D · ±50°/m

100 m/min underground reeling

10 m water depth

14 current rows

Family	Designation	Application	Construction	Tensile	Torsion	Radius	Speed	Water	
TROMMELFLEX PUR-HF	D12Y11YU11Y-J/O	Crane, hoist, reel, festoon and material handling	Polyester insulation; PUR inner/outer; textile carrier	25 N/mm²	±50°/m	6D	180 m/min; consult above	50 m	-

Family	Designation	Application	Construction	Tensile	Torsion	Radius	Speed	Water	
TROMMELFLEX-M-PUR	D2X11Y	Underground drills, scoops and LHDs	XLPE; halogen-free inner polymer; yellow PUR outer	20 N/mm²	±50°/m	8D reeling	60 m/min	10 m	-
TROMMELFLEX-M-PUR BRAIDED	D2X11Y	Higher-tension underground reel duty	XLPE; aramid carrier; reinforcement braid; yellow PUR	25 N/mm²	±50°/m	8D reeling	100 m/min	10 m	-

6. Electrical, thermal, fire and environmental framework

Rated voltage
0.6/1 kV; maximum AC 0.7/1.2 kV; maximum DC 0.9/1.8 kV.

Test voltage
2.5 kV AC for main cores, five minutes; M-PUR control cores 2 kV.

Thermal
90°C conductor and 250°C short-circuit conductor temperature.

Fire
Halogen-free construction and flame performance referenced to IEC 60332-1 / IEC 60332-1-2.

PUR-HF cold duty
Fixed −50…+80°C; fully flexible −40…+80°C.

M-PUR cold duty
Fixed −40…+80°C; fully flexible −30…+80°C.

Water boundary: PUR-HF is published for permanent non-potable water use to 50 m. M-PUR and M-PUR BRAIDED are published to 10 m. The gland, coupler, connector, splice and water chemistry require separate system qualification.

7. Complete TROMMELFLEX PUR-HF matrix — 30 rows

▼ TROMMELFLEX PUR-HF · Control cables, 1.5 mm² · 5 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	S
7x1.5	20298910	1.5	12	13.2	79	23	26	13.3	23	**0.21**	current officia
12x1.5	20224159	1.5	15.5	16.7	1	36	45	13.3	23	**0.21**	current officia
18x1.5	20165499	1.5	16.9	18.1	109	47	67	13.3	23	**0.21**	current officia
24x1.5	20194516	1.5	19	20.2	121	6	9	13.3	23	**0.21**	current officia
30x1.5	20300561	1.5	21.1	22.5	135	75	112	13.3	23	**0.21**	current officia

▼ TROMMELFLEX PUR-HF · Control cables, 2.5 mm² · 6 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	S
7x2.5	20290595	2	13.5	14.7	88	31	43	7.98	3	**0.36**	current officia
12x2.5	20181296	2	18.9	20.1	121	55	75	7.98	3	**0.36**	current officia
18x2.5	20267171	2	19.2	20.4	122	67	112	7.98	3	**0.36**	current officia
24x2.5	20160534	2	21.5	22.9	137	87	15	7.98	3	**0.36**	current officia
30x2.5	20197804	2	24.4	26	156	109	187	7.98	3	**0.36**	current officia
36x2.5	20140743	2	27.4	29	174	141	225	7.98	3	**0.36**	current officia

▼ TROMMELFLEX PUR-HF · Four-core power cables · 8 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	S
4x1.5	*not published*	1.5	10	11.2	67	15	15	13.3	23	**0.21**	current officia
4x2.5	20290594	2	11.1	12.2	74	2	25	7.98	3	**0.36**	current officia
4x4	20224160	2.5	12.3	13.5	81	28	4	4.95	41	**0.57**	current officia
4x6	20161503	3.1	14.1	15.2	92	37	6	3.3	53	**0.86**	current officia
4x10	20281655	4.1	17.4	18.6	112	6	1	1.91	74	**1.43**	current officia
4x16	20217922	5.1	20	21.4	128	85	16	1.21	99	**2.29**	current officia
4x25	20149378	6.2	23.5	24.9	149	123	25	0.7839	131	**3.58**	current officia

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	
4x35	20156715	7.8	28.5	30.2	181	176	35	0.554	162	5.01	current officia

▼ TROMMELFLEX PUR-HF · Five-core power cables · 8 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	
5x1.5	20225872	1.5	10.6	11.7	71	17	18	13.3	23	0.21	current officia
5x2.5	20300565	2	11.8	13	78	23	31	7.98	3	0.36	current officia
5x4	20300562	2.5	13.3	14.5	87	33	5	4.95	41	0.57	current officia
5x6	20259253	3.1	16.4	17.6	106	48	75	3.3	53	0.86	current officia
5x10	20215779	4.1	18.7	19.9	119	72	125	1.91	74	1.43	current officia
5x16	20300563	5.1	21.7	23	139	103	2	1.21	99	2.29	current officia
5x25	*not published*	6.2	28.2	29.8	179	15	312	0.7839	131	3.58	current officia
5x35	*not published*	7.8	31	33	198	214	437	0.554	162	5.01	current officia

▼ TROMMELFLEX PUR-HF · Combined power and screened control elements · 3 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	
4x6+4x(2x1.5)C	20228008	3.1	23.1	24.5	147	87	6	3.3	53	0.86	current offici
4x16+2x(4x1.5)C	20171151	5.1	24.7	26.3	158	114	16	1.21	99	2.29	current offici
4x35+2x(4x1.5)C	20173747	7.5	31.5	33.5	201	195	35	0.554	162	5.01	current offici

8. Current TROMMELFLEX-M-PUR matrix — 12 rows

The current brochure does not print Part numbers. Nine official identifiers from the previous product sheet are therefore retained in separate “Legacy Part no.” columns rather than presented as current order codes.

▼ TROMMELFLEX-M-PUR · Three-phase power with split PE and controls · 9 rows

Construction	Current Part no.	Legacy Part no.	Legacy A	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	St
3x25+3G6+2x1	*not published*	20335531	121	6.2	22.5	24	192	113	15	0.78	131	3.58	current 2025 ma
3x35+3G6+2x1.5	*not published*	20335532	150	7.8	26.5	28	224	153	21	0.554	162	5.01	current 2025 ma
3x50+3G10+2x1.5	*not published*	20333885	183	9.6	30	32	256	216	3	0.386	202	7.15	current 2025 ma
3x70+3G16+2x1.5	*not published*	20335533	234	11.1	35	37	296	305	42	0.272	25	10.01	current 2025 ma
3x95+3G16+2x1.5	*not published*	20335534	284	12.6	39.5	42	336	369	57	0.206	302	13.59	current 2025 ma
3x120+3G25+2x1.5	*not published*	20335535	330	14.8	44	46.5	372	481	72	0.161	352	17.16	current 2025 ma
3x150+3G25+2x1.5	*not published*	20335536	380	16	49	52	416	578	9	0.129	404	21.45	current 2025 ma
3x185+3G35+2x1.5	*not published*	20335537	434	17.7	53.5	56	448	73	111	0.106	461	26.46	current 2025 ma
3x240+3G50+2x1.5	*not published*	20335538	512	20.2	61.5	64.5	516	96	144	0.0801	54	34.32	current 2025 ma

▼ TROMMELFLEX-M-PUR · Four-core power · 2 rows

Construction	Current Part no.	Legacy Part no.	Legacy A	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	Sta
4x50	*not published*	—	—	9.6	33	35	28	245	4	0.386	202	7.15	current 2025 matr
4x70	*not published*	—	—	11.1	38.1	40.6	325	33	56	0.272	25	10.01	current 2025 matr

▼ TROMMELFLEX-M-PUR · Composite power and control · 1 rows

Construction	Current Part no.	Legacy Part no.	Legacy A	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	S
4G70+2x(10x2.5)+1x(8x1.5)C	*not published*	—	—	11.1	62	66	528	53	56	0.272	25	10.01	current 2025 m

9. Current TROMMELFLEX-M-PUR BRAIDED matrix — 14 rows

▼ TROMMELFLEX-M-PUR BRAIDED · Three-phase power without control cores · 4 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	Status
3x25+3G6	*not published*	6.2	23	25	2	1215	1875	0.78	131	3.58	current 2025 matrix; Isc d
3x50+3G10	*not published*	9.6	30.5	32.5	26	225	375	0.386	202	7.15	current 2025 matrix; Isc d
3x70+3G16	*not published*	11.1	35.5	37.5	3	321	525	0.272	25	10.01	current 2025 matrix; Isc d
3x95+3G16	*not published*	12.6	39.5	42.5	34	3925	7125	0.206	301	13.59	current 2025 matrix; Isc d

▼ TROMMELFLEX-M-PUR BRAIDED · Three-phase power with split PE and controls · 9 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	Statu
3x25+3G6+2x1	*not published*	6.2	23	24.5	196	1243	1875	0.78	131	3.58	current 2025 matrix; Isc
3x35+3G6+2x1.5	*not published*	7.8	26.5	28	224	157	21	0.554	162	5.01	current 2025 matrix; Isc
3x50+3G10+2x1.5	*not published*	9.6	30.5	32.5	26	2376	375	0.386	202	7.15	current 2025 matrix; Isc
3x70+3G16+2x1.5	*not published*	11.1	35.5	37.5	3	3355	525	0.272	25	10.01	current 2025 matrix; Isc
3x95+3G16+2x1.5	*not published*	12.6	40	42.5	34	4059	7125	0.206	301	13.59	current 2025 matrix; Isc
3x120+3G25+2x1.5	*not published*	14.8	44.5	47	376	5291	9	0.161	352	17.16	current 2025 matrix; Isc
3x150+3G25+2x1.5	*not published*	16	49.5	52.5	42	6358	1125	0.129	404	21.45	current 2025 matrix; Isc
3x185+3G35+2x1.5	*not published*	17.7	54	56.5	452	803	13875	0.106	461	26.46	current 2025 matrix; Isc
3x240+3G50+2x1.5	*not published*	20.2	62	65	52	1056	18	0.0801	54	34.32	current 2025 matrix; Isc

▼ TROMMELFLEX-M-PUR BRAIDED · Four-core power · 1 rows

Construction	Current Part no.	Conductor Ø	Dmin	Dmax	R moving	kg/km	Fmax N	R20 Ω/km	A	Isc kA	Status
4x16	*not published*	5.1	22	23.5	188	9	16	1.21	99	2.29	current 2025 matrix; Isc de

10. M-PUR current-carrying-capacity revision

Construction	Legacy Part no.	Legacy A	Current A	I
3x25+3G6+2x1	20335531	121	131	10
3x35+3G6+2x1.5	20335532	150	162	12
3x50+3G10+2x1.5	20333885	183	202	19
3x70+3G16+2x1.5	20335533	234	250	16
3x95+3G16+2x1.5	20335534	284	302	18
3x120+3G25+2x1.5	20335535	330	352	22
3x150+3G25+2x1.5	20335536	380	404	24
3x185+3G35+2x1.5	20335537	434	461	27
3x240+3G50+2x1.5	20335538	512	540	28

Revision control: current ampacity values are used for current preliminary selection. The legacy values remain relevant when evaluating an older supplied Part number or archived project documentation.

11. Dimensional and tensile effect of the braided design

Construction	Dmax unbraided	Dmax braided	ΔD	kg/km unbraided	kg/km braided	Δ mass	F unbraided	F bra
3x25+3G6+2x1	24	24.5	0.5	113	1243	113	15	1875
3x35+3G6+2x1.5	28	28	0	153	157	4	21	21
3x50+3G10+2x1.5	32	32.5	0.5	216	2376	216	3	375

Construction	Dmax unbraided	Dmax braided	ΔD	kg/km unbraided	kg/km braided	Δ mass	F unbraided	F bra
3x70+3G16+2x1.5	37	37.5	0.5	305	3355	305	42	525
3x95+3G16+2x1.5	42	42.5	0.5	369	4059	369	57	7125
3x120+3G25+2x1.5	46.5	47	0.5	481	5291	481	72	9
3x150+3G25+2x1.5	52	52.5	0.5	578	6358	578	9	1125
3x185+3G35+2x1.5	56	56.5	0.5	73	803	73	111	13875
3x240+3G50+2x1.5	64.5	65	0.5	96	1056	96	144	18

The braid and central aramid carrier generally add mass and increase Fmax from the 20 N/mm² rule to the 25 N/mm² rule. The exact diameter change is construction-specific.

12. Representative engineering calculations

Three-phase apparent power at 1 kV:
$S = \sqrt{3} \times U \times I$

Active power at cosφ 0.9:
$P = S \times 0.9$

Resistive voltage drop for 100 m:
$\Delta U = \sqrt{3} \times I \times R20 \times 0.1\ km$

Weight of 100 m:
$W = mass \times 0.1 \times g$

Minimum free loop diameter:
approximately 2 × published moving radius

The calculations do not replace motor-starting, VFD reflected-wave, thermal grouping, reel torque or dynamic acceleration analysis.

Family	Construction	A	kVA	kW @0.9	ΔU/100m	Weight 100m	Loop diameter
PUR-HF	4x35	162	280.6	252.5	1.55%	1.73 kN	362 mm
PUR-HF combined	4x35+2x(4x1.5)C	162	280.6	252.5	1.55%	1.91 kN	402 mm
M-PUR	3x95+3G16+2x1.5	302	523.1	470.8	1.08%	3.62 kN	672 mm
M-PUR composite	4G70+2x(10x2.5)+1x(8x1.5)C	250	433	389.7	1.18%	5.2 kN	1056 mm
M-PUR BRAIDED	3x95+3G16+2x1.5	301	521.3	469.2	1.07%	3.98 kN	68 mm

13. Source anomaly and inference audit

Item	Field	Published status	Treatment	Reason
PUR-HF 4x1.5, 5x25 and 5x35	Part number	Blank in current official matrix	Kept blank	The source states that rows without a Part number are approximate confirmed at order.
M-PUR first nine power rows	Part number	Current 2025 matrix omits Part numbers	Legacy official Part numbers retained separately	The older official product sheet published identifiers 20335531–203 20333885.
M-PUR current capacity	Ampacity	2025 values exceed the older 2022 sheet	Both generations displayed	Current values are used for the current matrix; legacy values are pr revision comparison.
M-PUR short-circuit current	Isc	Not tabulated in the 2025 matrix	Derived by conductor section	Values follow the same conductor-section short-circuit values publis the official series.
M-PUR 3x25 resistance	R20	0.78 Ω/km current; 0.7839 Ω/km legacy	Current rounded value retained	No silent replacement; the revision difference is explained.
M-PUR composite 4G70 + controls	Fmax	5,600 N	Applied to main 4G70 power copper	The table does not add the control copper to the tensile-force rule.
Water depth	Permanent immersion	PUR-HF 50 m; M-PUR 10 m	Strictly separated	The two families use different construction and application limits.

14. Engineering selection workflow

TROMMELFLEX-PUR engineering selection workflow

1. Application
crane / mine / tunnel

2. Circuit
power / control / pairs

3. Mechanics
F · R · speed · torsion

4. Environment
water · fire · cold

- Choose PUR-HF for industrial reels and severe bending; choose M-PUR for underground reeling.
- Select the braided branch when the 25 N/mm² and 100 m/min envelope is required.
- Verify current Dmin/Dmax, mass, radius, current and Part number for the exact construction.
- Qualify the complete water system: cable, gland, coupler, repair joint and water chemistry.
- Do not combine PUR-HF 50 m water duty with M-PUR, or apply braided limits to the unbraided cable.

15. Installation and acceptance checklist

- Confirm the exact family: PUR-HF, M-PUR or M-PUR BRAIDED.
- Verify the current construction, Part number status, Dmin/Dmax, radius, mass, Fmax, R20 and ampacity.
- For underground reels, define reel torque, acceleration, guide pressure, trailing abrasion and cable payout geometry.
- Use the braided design only where the central aramid carrier and reinforcement termination are mechanically supported.
- Do not apply PUR-HF 50 m water duty to M-PUR; qualify the complete accessory system for immersion.
- Check PE continuity and every control circuit before commissioning.
- For combined control elements, confirm screening, pair assignment, protocol requirements and termination.
- Record conductor resistance, agreed insulation test and baseline mechanical/visual condition.

16. Failure mode and effects analysis

Wrong PUR family: industrial PUR-HF limits are applied to an underground M-PUR construction.

Water-depth transfer: the 50 m PUR-HF claim is applied to a 10 m M-PUR cable or unqualified connector.

Unbraided over-speed: the 100 m/min braided limit is used for the 60 m/min unbraided design.

Carrier bypass: the braided aramid carrier is not anchored in the termination.

Control-element overload: the main-power tensile rule is incorrectly applied to small control conductors.

Revision mixing: legacy Part numbers are combined with current ampacity without project-specific verification.

17. Source map and scope

Document	Role	Scope
Official TROMMELFLEX / FESTOONFLEX PUR-HF brochure, current issue	PUR-HF construction and matrix	30 current rows, Part numbers, 25 N/mm², 6D, ±50°/m, 180 m/min reference and 50
Official Mining & Tunnelling brochure, 2025	Current M-PUR families	12 unbraided and 14 braided rows, 20/25 N/mm², 60/100 m/min, 8D and 10 m wate
Official four-page M-PUR product sheet, version 5	Legacy identifiers	Nine legacy Part numbers and earlier ampacity values.
Crane Cables General Catalogue, product revision 2019	Cross-check	PUR-HF construction, electrical parameters and historical matrix presentation.

This guide supports preliminary engineering and technical comparison. Current availability, certificates, compounds, Part numbers and guaranteed operating limits must be confirmed for the exact production batch.

Phone
+86 13855123218

Technical email
Tech@feichuncables.com

Feichun Cable is not affiliated with the owners of the TROMMELFLEX, PUR-HF, D12Y11YU11Y or D2X11Y designations. Diagrams are independent engineering reconstructions, not manufacturing drawings. Source, legacy and derived data are explicitly separated.