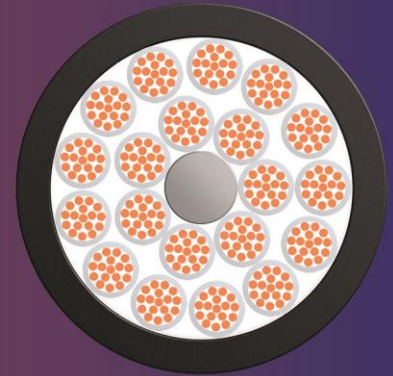


ROLLING STOCK - SIGNAL- AND CONTROL CABLES

BETAtans® GKW-ENX flex R 600 V MM 105

Multicore sheathed cable



Application

This multicore sheathed cable is designed for fixed and protected installations inside and outside of rail vehicles and buses. Due to the very small diameter it is used where space is very limited. For installation the guidelines of EN 50355 and EN 50343 must be considered.

Construction

Conductor	Tinned fine copper strand acc. to VDE 0295 / IEC 60228, class 5
Insulation	Polyolefin Copolymer, Comp 712, electron beam cross-linked
Colour	White with number imprint, further colours upon request
Filler	Optional
Sheath	Polyolefin Copolymer, Comp 752, electron beam cross-linked
Colour	Black

Advantages

- Halogen free
- Electron beam cross-linked
- Weight and volume-optimised
- Very long lifetime
- Good media resistance
- High level cold resistance
- Infusible
- Low fire load

Electrical properties

Rated value	U0/U	0.6 / 1 kV AC
Maximum voltage	U0m	0.72 kV AC
Maximum voltage	Um	1.2 kV AC
Maximum voltage	V0	0.9 kV DC
Maximum voltage	Vm	1.8 kV DC
Test voltage		3.5 kV, 50 Hz / 5 min.

Thermal properties

Max. operating temperature	fest verlegt	+125°C
Min. ambient temperature	fest verlegt	-40°C
Max. short circuit temperature		+280°C (max. 5s)

Mechanical properties

Bending radius	fixed installation	Ø < 10 mm: > 3 x Ø (-40°C)
Bending radius	fixed installation	Ø ≥ 10 mm: > 4 x Ø (-40°C)

Material properties / Standards

Material properties	EN 50306-4 hazard level MM
Ozone resistant	EN 50305
High resistance to cold	EN 60811-504
High resistance to oil	EN 60811-404
High resistance to fuel	EN 60811-404
Resistance to acid	EN 60811-404
Resistance to alkaline	EN 60811-404

Material properties / Standards

Low fire load	DIN 51900
Limiting oxygen index (LOI)	ISO 4589-2 ASTM D 2863
Resistance to UV	EN 50618
Fire performance for rolling stock	EN 45545-2 HL1 - HL3
Fire performance for rolling stock	EN 50306-4
Vertical flame propagation for a single insulated wire or cable	EN 60332-1-2
Vertical flame spread of bunched wires or cables ≥ 12 mm	EN 60332-3-24
Vertical flame spread of bunched wires or cables > 6 < 12 mm	EN 60332-3-25
Vertical flame spread of bunched wires or cables ≤ 6 mm	EN 50305
Smoke density	EN 61034-2
Toxicity of gases	EN 50305
Absence of halogens	EN 60754-1 EN 60684-2
Corrosivity of gases	EN 60754-2
Fire performance for rolling stock	NFPA130
Vertical flame propagation for bunched wires or cables	FT 4/IEEE 1202
Smoke release	UL 1685

Approvals

Swiss Federal Railways

Construction Cross-sec. [n x mm ²]	Color code	Conductor-Ø [mm]	R ₂₀ [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
2 x 0.5	NR	0.85	40.1	5.50 ± 0.20	42	0.140	313143
2 x 0.5	rd, bl	0.85	40.1	5.50 ± 0.20	42	0.140	316804
3 x 0.5	NR	0.85	40.1	5.50 ± 0.20	46	0.130	313144
4 x 0.5	NR	0.85	40.1	5.10 ± 0.20	44	0.110	312970
4 x 0.5	rd, bl, wh, ye	0.85	40.1	5.10 ± 0.20	44	0.110	316451
4 x 0.5	NR spez	0.85	40.1	5.10 ± 0.20	44	0.110	317260
5 x 0.5	NR	0.85	40.1	5.50 ± 0.20	53	0.130	313147
6 x 0.5	NR	0.85	40.1	5.80 ± 0.20	58	0.140	313148
7 x 0.5	NR	0.85	40.1	5.80 ± 0.20	62	0.140	313149
8 x 0.5	NR	0.85	40.1	6.70 ± 0.20	78	0.190	313150
9 x 0.5	NR	0.85	40.1	7.10 ± 0.20	79	0.170	*
9 G 0.5	br, gn, bl, ye, gy, gy, gnye bk, wh	0.85	40.1	7.10 ± 0.20	79	0.170	316450
10 x 0.5	NR	0.85	40.1	6.80 ± 0.20	85	0.180	313151
12 x 0.5	NR	0.85	40.1	7.20 ± 0.20	98	0.200	316158
14 x 0.5	NR	0.85	40.1	7.60 ± 0.20	112	0.210	*
16 x 0.5	NR	0.85	40.1	8.00 ± 0.20	127	0.240	*
18 x 0.5	NR	0.85	40.1	8.50 ± 0.20	142	0.280	*
19 x 0.5	NR	0.85	40.1	8.50 ± 0.20	144	0.280	*
20 x 0.5	NR	0.85	40.1	9.00 ± 0.20	157	0.300	317319
24 x 0.5	NR	0.85	40.1	9.80 ± 0.20	174	0.320	313152
25 x 0.5	NR	0.85	40.1	10.20 ± 0.30	186	0.360	315957
27 x 0.5	NR	0.85	40.1	10.20 ± 0.30	198	0.340	*
36 x 0.5	NR	0.85	40.1	11.50 ± 0.30	253	0.450	*
48 x 0.5	NR	0.85	40.1	12.90 ± 0.30	326	0.560	313153
2 x 0.75	NR	1.1	26.7	5.20 ± 0.20	42	0.120	313154
2 x 0.75	NR	1.1	26.7	5.20 ± 0.20	42	0.120	316216
3 x 0.75	NR	1.1	26.7	5.20 ± 0.20	47	0.110	313155
3 x 0.75	rd, gn, bl	1.1	26.7	5.20 ± 0.20	47	0.110	316215
3 G 0.75	NRPE	1.1	26.7	5.20 ± 0.20	47	0.110	313156
4 x 0.75	NR	1.1	26.7	5.60 ± 0.20	56	0.130	313157
5 x 0.75	NR	1.1	26.7	6.10 ± 0.20	65	0.140	313158
6 x 0.75	NR	1.1	26.7	6.50 ± 0.20	77	0.160	313159
7 x 0.75	NR	1.1	26.7	6.60 ± 0.20	84	0.170	*
8 x 0.75	NR	1.1	26.7	7.60 ± 0.20	102	0.220	313160

Construction Cross-sec. [n x mm ²]	Color code	Conductor-Ø [mm]	R ₂₀ [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
9 x 0.75	NR	1.1	26.7	8.10 ± 0.20	108	0.200	*
10 x 0.75	NR	1.1	26.7	7.80 ± 0.20	117	0.210	*
12 x 0.75	NR	1.1	26.7	8.30 ± 0.20	136	0.240	*
14 x 0.75	NR	1.1	26.7	8.70 ± 0.20	155	0.270	*
16 x 0.75	NR	1.1	26.7	9.20 ± 0.20	173	0.310	313161
18 x 0.75	NR	1.1	26.7	9.80 ± 0.20	195	0.350	313162
19 x 0.75	NR	1.1	26.7	9.70 ± 0.30	198	0.340	*
20 x 0.75	NR	1.1	26.7	10.20 ± 0.30	218	0.370	*
24 x 0.75	NR	1.1	26.7	11.30 ± 0.30	241	0.400	313163
27 x 0.75	NR	1.1	26.7	11.80 ± 0.30	274	0.410	*
36 x 0.75	NR	1.1	26.7	13.30 ± 0.30	360	0.540	*
48 x 0.75	NR	1.1	26.7	15.00 ± 0.30	456	0.680	*
2 x 1	NR	1.2	20	5.40 ± 0.20	48	0.130	313164
3 x 1	NR	1.2	20	5.50 ± 0.20	58	0.130	313165
3 x 1	NR	1.2	20	5.50 ± 0.20	58	0.130	316544
3 G 1	NRPE	1.2	20	5.50 ± 0.20	58	0.130	313166
4 x 1	NR	1.2	20	6.10 ± 0.20	70	0.160	313167
4 G 1	NRPE	1.2	20	6.10 ± 0.20	70	0.160	316316
5 x 1	NR	1.2	20	6.60 ± 0.20	76	0.150	313168
5 G 1	NRPE	1.2	20	6.60 ± 0.20	76	0.150	316317
6 x 1	NR	1.2	20	7.20 ± 0.20	101	0.210	313169
7 x 1	NR	1.2	20	7.10 ± 0.20	107	0.200	313170
7 G 1	NRPE	1.2	20	7.10 ± 0.20	107	0.200	317104
8 x 1	NR	1.2	20	8.30 ± 0.20	134	0.280	317336
9 x 1	NR	1.2	20	8.90 ± 0.20	138	0.240	*
10 x 1	NR	1.2	20	8.60 ± 0.20	147	0.270	313171
10 G 1	NRPE	1.2	20	8.60 ± 0.20	147	0.270	314696
10 x 1	NR	1.2	20	8.60 ± 0.20	147	0.270	316672
12 x 1	NR	1.2	20	9.10 ± 0.20	171	0.300	313172
12 G 1	Coloured	1.2	20	9.10 ± 0.20	171	0.300	313173
13 x 1	NR	1.2	20	9.90 ± 0.20	181	0.320	316307
14 x 1	NR	1.2	20	9.70 ± 0.20	200	0.330	*
16 x 1	NR	1.2	20	10.20 ± 0.30	225	0.370	*
18 x 1	NR	1.2	20	10.80 ± 0.30	254	0.410	*

Construction Cross-sec. [n x mm ²]	Color code	Conductor-Ø [mm]	R ₂₀ [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
19 x 1	NR	1.2	20	10.70 ± 0.30	255	0.420	*
20 x 1	NR	1.2	20	11.40 ± 0.30	277	0.480	313174
24 x 1	NR	1.2	20	12.50 ± 0.30	322	0.530	313175
25 x 1	NR	1.2	20	13.00 ± 0.30	330	0.540	315956
27 x 1	NR	1.2	20	13.00 ± 0.30	353	0.510	*
36 x 1	NR	1.2	20	14.70 ± 0.30	455	0.680	*
46 x 1	NR	1.2	20	16.60 ± 0.30	577	0.870	313176
48 x 1	NR	1.2	20	16.60 ± 0.30	591	0.850	*
2 x 1.5	NR	1.45	13.7	5.90 ± 0.20	62	0.150	313177
3 x 1.5	NR	1.45	13.7	6.20 ± 0.20	75	0.160	313178
3 G 1.5	NRPE	1.45	13.7	6.20 ± 0.20	75	0.160	313179
4 x 1.5	NR	1.45	13.7	6.80 ± 0.20	94	0.190	313180
4 G 1.5	NRPE	1.45	13.7	6.80 ± 0.20	94	0.190	313181
5 x 1.5	NR	1.45	13.7	7.50 ± 0.20	116	0.220	313182
5 G 1.5	NRPE	1.45	13.7	7.50 ± 0.20	116	0.220	313183
6 x 1.5	NR	1.45	13.7	8.20 ± 0.20	137	0.270	313184
7 x 1.5	NR	1.45	13.7	8.20 ± 0.20	148	0.260	313185
7 G 1.5	NRPE	1.45	13.7	8.20 ± 0.20	148	0.260	313186
8 x 1.5	NR	1.45	13.7	9.60 ± 0.20	187	0.360	312969
9 x 1.5	NR	1.45	13.7	10.30 ± 0.30	192	0.320	*
10 x 1.5	NR	1.45	13.7	10.00 ± 0.30	206	0.350	313187
12 x 1.5	NR	1.45	13.7	10.50 ± 0.30	239	0.390	313188
12 G 1.5	NRPE	1.45	13.7	10.50 ± 0.30	239	0.390	313189
13 x 1.5	NR	1.45	13.7	11.50 ± 0.30	249	0.400	*
14 x 1.5	NR	1.45	13.7	11.20 ± 0.30	280	0.440	*
16 x 1.5	NR	1.45	13.7	11.80 ± 0.30	312	0.490	313190
18 x 1.5	NR	1.45	13.7	12.60 ± 0.30	356	0.550	*
19 x 1.5	NR	1.45	13.7	12.50 ± 0.30	359	0.540	317066
20 x 1.5	NR	1.45	13.7	13.20 ± 0.30	390	0.610	313191
22 x 1.5	NR	1.45	13.7	13.90 ± 0.30	431	0.680	313192
24 x 1.5	NR	1.45	13.7	14.70 ± 0.30	443	0.620	*
25 G 1.5	NRPE	1.45	13.7	15.10 ± 0.30	466	0.690	313293
27 x 1.5	NR	1.45	13.7	15.10 ± 0.30	487	0.680	313333
36 x 1.5	NR	1.45	13.7	17.20 ± 0.30	643	0.870	*

Construction Cross-sec. [n x mm ²]	Color code	Conductor-Ø [mm]	R ₂₀ [mΩ/m]	Outer-Ø [mm]	Weight [kg/km]	Fire load [kWh/m]	Part no.
37 x 1.5	NR	1.45	13.7	17.80 ± 0.30	680	0.980	312968
48 x 1.5	NR	1.45	13.7	19.40 ± 0.30	850	1.120	*
2 x 2.5	NR	1.95	8.21	7.00 ± 0.20	91	0.200	313193
3 x 2.5	NR	1.95	8.21	7.40 ± 0.20	114	0.210	313194
3 G 2.5	NRPE	1.95	8.21	7.40 ± 0.20	114	0.210	313195
4 x 2.5	NR	1.95	8.21	8.20 ± 0.20	144	0.250	313196
4 G 2.5	NRPE	1.95	8.21	8.20 ± 0.20	144	0.250	313197
5 x 2.5	NR	1.95	8.21	9.00 ± 0.20	176	0.300	*
5 G 2.5	NRPE	1.95	8.21	9.00 ± 0.20	176	0.300	313198
6 x 2.5	NR	1.95	8.21	9.80 ± 0.20	209	0.350	313199
7 x 2.5	NR	1.95	8.21	9.80 ± 0.30	225	0.340	*
7 G 2.5	NRPE	1.95	8.21	9.80 ± 0.30	225	0.340	313200
8 x 2.5	NR	1.95	8.21	11.60 ± 0.30	290	0.470	*
9 x 2.5	NR	1.95	8.21	12.50 ± 0.30	292	0.400	*
10 x 2.5	NR	1.95	8.21	12.20 ± 0.30	324	0.440	*
12 x 2.5	NR	1.95	8.21	12.80 ± 0.30	378	0.490	317067
14 x 2.5	NR	1.95	8.21	13.60 ± 0.30	433	0.550	*
16 x 2.5	NR	1.95	8.21	14.40 ± 0.30	490	0.610	315955
18 x 2.5	NR	1.95	8.21	15.20 ± 0.30	554	0.700	*
19 x 2.5	NR	1.95	8.21	15.20 ± 0.30	561	0.720	*
20 x 2.5	NR	1.95	8.21	16.10 ± 0.30	618	0.790	*
24 x 2.5	NR	1.95	8.21	17.90 ± 0.30	698	0.880	313201
27 x 2.5	NR	1.95	8.21	18.50 ± 0.30	779	0.860	*
36 x 2.5	NR	1.95	8.21	20.90 ± 0.40	1037	1.130	*
48 x 2.5	NR	1.95	8.21	23.90 ± 0.40	1358	1.410	*

Note:

* Upon request

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