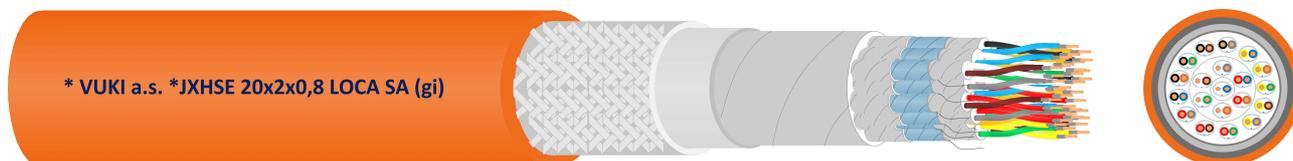


5. INDUSTRIAL CABLES / 5.1 HALOGEN-FREE / J(L,C)H(X)K(F,O,S,J)E-R(V) LOCA SA (gi)



Halogen-free cables intended for nuclear power plant of VVER 440 type



Application:

Signal cables in LOCA execution are intended for nuclear power plant of type VVER 440 (STN IEC 60780, IEEE323, IEEE 383). Cables are suited for signal transmission, with resistance to flame propagation according to STN EN 60332-3... (STN EN 50266-2-...), halogen-free, with low density of smoke according to STN EN 61034-2 and low corrosivity of combustion gases according to STN EN 50267-2-3. These are used for fixed installation both in normal and moist environments (STN 33 2000-5-51). Cables can be used in the fire hazard conditions and can be installed on flammable material. Cables type -V are functional in fire for time period 180 min. according to IEC 60331-23. In a primary zone of nuclear power plant VVER 440 are guaranteed life 40 years in normal use, including LOCA and severe accidents.

Cable construction:

- **Number of pairs:** 1, 2, 3, 4, 5, 8, 10, 12, 15, 16, 20
- **Cable cores:** Cu or CuSn, conductor cl. 1, cl. 2 or cl.5
Nominal diameter for conductors cl. 1: 0,4; 0,5; 0,6; 0,8; 1,0;
- **Nominal cross-section for conductors cl. 2 or cl. 5:** 0,35; 0,5; 0,75; 1,0; 1,5;
- **Conductor insulation:** Special mixtures on homo- / copolymere base (-V type in combination with mica-glass tape)
- Conductors are coiled to pairs. Halogen-free, flame-retarding filler is placed above the coiled pairs.
- **Shield construction:** K- unshielded cable
 F(or St) - ALPET foil + enclosed CuSn wire / or 2x Cu tape with nominal thickness 0,07mm with positive overlap
 O - Cu braiding with min. covering 75 %
 S - CuSn braiding with min. covering 75 %
 J - longitudinal ALPET foil + CuSn braiding with min. covering 45 %
- **Filler:** halogen-free, flame-retardant material
- **Sheath cable:** halogen-free, flame-retardant material
- **Colour of sheath:** type -V orange, type -R green, or other if required

Technical data:

- **Nominal voltage:** 225 V
- **Test voltage :** 500 V
- **Insulation resistance, min.:** 100 MΩ.km
- **Mutual capacitance (at 800 Hz), max.:** 120 nF/km*
 (* the value can exceed of 20% by cables up to 4-pairs)
- **Max. admissible conductor temperature:** +70 °C
- **Operating temperature:** -40 °C to +70 °C
- **Min. temperature for laying:** -5 °C
- **Min. bending radius:** 15 x cable diameter

Letter code:

position	letter	meaning
1.	J(or JE)	copper conductor cl. 1, cl. 2 or cl. 5
	C	copper conductor cl. 1
	L	copper conductor cl. 2 or cl.5
2.	H	EPR and combinations (-V type in combination with mica-glass tape)
	X	cross-linked polyethylene (-V type in combination with mica-glass tape)
3.	K	unshielded cable
	F, St, O, S, J	shielded cable
4.	E(or H)	homo- / copolymere ethylen, HFFR
	R	cable is flame-retardant
5.	V	cable is flame-retardant with maintaining its functionality at fire cable is dedicated to nuclear power plant VVER 440resistant to LOCA and severe accident
	LOCA	accident

5. INDUSTRIAL CABLES / 5.1 HALOGEN-FREE / J(L,C)H(X)K(F,O,S,J)E-R(V) LOCA SA (gi)



Marking:

- Colour coded for type JE-H(S)H... acc. to VDE 0815.

Pair	1		2		3		4	
Core	a	b	a	b	a	b	a	b
Colour	blue	red	grey	yellow	green	brown	white	black

Groups are distinguished by identify tape.

Conductor colour in 5-pair cable: a-purple, b-orange

2-pair cable as X-shape:

1 in pair	a-conductor	blue	b-conductor	red
2 in pair	a-conductor	grey	b-conductor	yellow

- Colour coded in pairs for type J(C,L)X

A cores colour is for	1-5 white
elements:	6-10 yellow
	11-15 orange
	16-20 purple
	21-25 black

B cores colour repeats in every group of 5 elements to differential conductor A in order:

red, green, blue, brown, grey