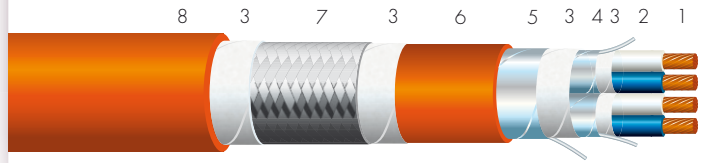


# ENERSYL® FR INSTRUM

## Instrumentation cables



- 1 • Stranded bare copper core, class 2 as per IEC 60228.
- 2 • Insulation: silicone rubber as per NF C 32-090 + optional filler(s).
- 3 • Optional separating tape.
- 4 • (optional) Individual electrical screen (EI): aluminium/PET tape + continuity wire.
- 5 • General electrical screen: aluminium/PET tape + continuity wire (EG) / tin-plated copper braid (BE) / bare copper braid (BR).
- 6 • (optional) Internal sheath: HFFR, type ST8 as per IEC 60502-1.
- 7 • (optional) Armour: galvanized steel braid (BG) / double steel tape (FA).
- 8 • Outer sheath: HFFR, type ST8 as per IEC 60502-1.

### Reference

- (example) ENERSYL® FR EI BG INSTRUM 2P1,5 mm<sup>2</sup>  
FR : fire resistant  
EI, EG, BE, BR: type of electrical screen  
BG, FA: type of armour  
INSTRUM: instrumentation cable  
2 : number of pairs, triples or quads  
P,T,Q: pairs, triples or quads  
1.5 mm<sup>2</sup>: cross-section in mm<sup>2</sup>

### Approvals - standards

- IEC 60228 / NF C 32-090.
- IEC 60332-1 / IEC 60332-3 / NF C 32-070 test C1.
- IEC 60331-21 / NF EN 50200.
- IEC 61034-2 / IEC 60754-1 / IEC 60754-2.

### Markings

- OMERIN – ENERSYL < FR xx xx xx INSTRUM >  
< cross-section > – 300/500V – < batch > – < year >

### Standard products

- Sheath: orange.
- Colour identification of conductors:  
> Pair: white and blue numbered.  
> Triple: white, red and blue numbered.  
> Quad: white, black, red and blue numbered.

### Technical characteristics

#### Thermal

- Continuous operating temperature: -30 °C to +80 °C.
- Maximum core temperature: +90 °C.

#### Electrical

- Rated voltage: 300/500 V.
- Test voltage: 2000 V.

#### Smoke - fire

- Flame retardant – cable alone:  
IEC 60332-1-2 / NF EN 60332-1-2 / NF C 32-070 test C2.
- Flame retardant – bunched cable:  
IEC 60332-3-22 cat. A / NF EN 60332-3-22 cat. A.
- Fire retardant: NF C 32-070 test C1.
- Fire resistant: IEC 60331-21 / NF EN 50200.
- Low smoke density: IEC 61034-2 / NF EN 61034-2.
- Halogen-free: IEC 60754-1 / NF EN 60754-1.
- Low corrosivity of gas emissions: IEC 60754-2 / NF EN 60754-2.

#### Resistance of outer sheath to chemical attacks as per OMERIN test report NT140220-01:

- Good resistance to acid.
- Good resistance to base.
- Fairly good resistance to aliphatic hydrocarbons.
- Resistance to water: type AD7 as per IEC 60529 without immersion of ends.
- Resistance to UV ≥ 2000 hours as per EN 16472.

### Options

- FLEX: flexible tin-plated copper core, class 5 as per IEC 60228. (0.9 mm<sup>2</sup> cross-section replaced by 1 mm<sup>2</sup>).
- Other colours: contact us.
- 105 °C cable: contact us.
- ATEX as per EN 60079-14.  
Particularly suited for static facilities in potentially explosive environments with "i" intrinsic safety protection mode, requiring specific identification of cables.  
Colour of the sheath: blue as per EN 60079-14 part 12.2.2.6.
- > ENERSYL® FR EI BE EX INSTRUM:  
with individual electrical screen (aluminium/PET tape) and general (tin-plated copper braid).
- > ENERSYL® FR EI EX INSTRUM:  
with individual and general electrical screen (aluminium/PET tape).
- > ENERSYL® FR BE EX INSTRUM:  
with general electrical screen (tin-plated copper braid).
- > ENERSYL® FR EG EX INSTRUM:  
with general electrical screen (aluminium/PET tape).

For this product, please contact:



**SEVI KABEL**

VIA DEI MARINAI D'ITALIA, 1 - 10034 CHIVASSO (TO) - Tel. 011.910.11.12 / 011.910.67.78 - Fax 011.913.13.13 - info@sevikabel.it

Number of pairs, triples or quads	Nominal cross-section (mm <sup>2</sup> )	Nominal stranding	Maximum linear resistance at 20 °C (Ω/km)	Nominal thickness of insulation (mm)	Nominal diameter of conductors (mm)	NON-SHIELDED CABLES Nominal outside diameter* (mm)						ARMoured CABLES Nominal outside diameter* (mm)							
						Pairs		Triples		Quads		Pairs		Triples		Quads			
						EG	EI	EG	EI	EG	EI	EG	EI	EG	EI	EG	EI		
1	0.5	7 / 0.30	36.0	0.6	2.1	5.6				6.0		6.5			8.6		9.0		9.8
2**	0.5	7 / 0.30	36.0	0.6	2.1	6.5	9.0	10.3	11.3	11.8	13.0	9.5	12.1	13.6	14.7	15.2	16.6		
3	0.5	7 / 0.30	36.0	0.6	2.1	9.0	9.9	11.1	11.8	12.8	14.1	12.1	13.0	14.4	15.2	16.4	17.8		
4	0.5	7 / 0.30	36.0	0.6	2.1	10.2	11.0	12.4	13.1	14.2	15.6	13.5	14.3	15.9	16.7	17.9	19.4		
5	0.5	7 / 0.30	36.0	0.6	2.1	11.4	12.2	13.8	14.6	15.8	17.1	14.7	15.7	17.3	18.3	19.6	21.2		
6	0.5	7 / 0.30	36.0	0.6	2.1	12.6	13.5	15.0	16.1	17.2	18.8	16.1	17.0	18.6	20.1	21.3	22.8		
7	0.5	7 / 0.30	36.0	0.6	2.1	12.6	13.5	15.0	16.1	17.2	18.8	16.1	17.0	18.6	20.1	21.3	22.8		
8	0.5	7 / 0.30	36.0	0.6	2.1	14.4	15.2	17.0	18.2			18.0	18.9	21.0	22.2				
9	0.5	7 / 0.30	36.0	0.6	2.1	15.8	16.6	18.6	19.9			19.5	20.6	22.5	24.0				
12	0.5	7 / 0.30	36.0	0.6	2.1	17.0	18.1	20.2	21.5			21.0	22.0	24.2	25.7				
19	0.5	7 / 0.30	36.0	0.6	2.1	20.2	21.3	23.7	25.4			24.2	25.5	27.8	29.8				
24	0.5	7 / 0.30	36.0	0.6	2.1	23.7	25.2					27.8	29.5						
37	0.5	7 / 0.30	36.0	0.6	2.1	27.3	28.8					31.7	33.2						
1	0.9	7 / 0.40	20.6	0.6	2.4	6.2		6.7		7.6		9.2		9.7		10.8			
2**	0.9	7 / 0.40	20.6	0.6	2.4	7.4	10.3	11.7	13.1	13.6	14.7	10.5	13.6	15.0	16.7	17.2	18.4		
3	0.9	7 / 0.40	20.6	0.6	2.4	10.4	11.1	12.6	13.5	14.5	15.8	13.7	14.4	16.1	17.1	18.2	19.9		
4	0.9	7 / 0.40	20.6	0.6	2.4	11.6	12.4	14.0	14.7	16.0	17.3	14.9	15.9	17.5	18.4	20.1	21.4		
5	0.9	7 / 0.40	20.6	0.6	2.4	12.9	13.8	15.3	16.3	17.7	19.2	16.4	17.3	19.1	20.4	21.8	23.2		
6	0.9	7 / 0.40	20.6	0.6	2.4	14.3	15.0	16.9	17.9	19.3	21.2	17.9	18.8	20.9	22.0	23.4	25.4		
7	0.9	7 / 0.40	20.6	0.6	2.4	14.3	15.0	16.9	17.9	19.3	21.2	17.9	18.8	20.9	22.0	23.4	25.4		
8	0.9	7 / 0.40	20.6	0.6	2.4	16.3	17.1	19.1	20.4			20.2	21.0	23.1	24.4				
9	0.9	7 / 0.40	20.6	0.6	2.4	17.8	18.6	21.0	22.1			21.7	22.6	25.1	26.4				
12	0.9	7 / 0.40	20.6	0.6	2.4	19.2	20.3	22.7	23.9			23.1	24.3	26.8	28.2				
19	0.9	7 / 0.40	20.6	0.6	2.4	22.7	23.8	26.8	28.3			26.8	27.9	31.2	32.8				
24	0.9	7 / 0.40	20.6	0.6	2.4	26.8	28.1					31.2	32.5						
37	0.9	7 / 0.40	20.6	0.6	2.4	31.0	32.5					35.5	37.0						
1	1.5	7 / 0.52	12.1	0.6	2.8	7.0		7.7		8.5		10.1		10.8		11.7			
2**	1.5	7 / 0.52	12.1	0.6	2.8	8.4	11.8	13.6	15.1	15.6	16.8	11.5	15.1	17.1	19.0	19.5	20.9		
3	1.5	7 / 0.52	12.1	0.6	2.8	12.2	12.8	14.5	15.1	16.6	18.0	15.7	16.3	18.1	19.0	20.7	22.1		
4	1.5	7 / 0.52	12.1	0.6	2.8	13.6	14.1	16.1	16.8	18.3	19.9	17.1	17.7	20.0	20.8	22.4	24.0		
5	1.5	7 / 0.52	12.1	0.6	2.8	14.9	15.7	17.7	18.6	20.4	22.0	18.5	19.5	21.7	22.6	24.4	26.2		
6	1.5	7 / 0.52	12.1	0.6	2.8	16.5	17.2	19.4	20.5	22.3	24.0	20.4	21.1	23.3	24.5	26.5	28.3		
7	1.5	7 / 0.52	12.1	0.6	2.8	16.5	17.2	19.4	20.5	22.3	24.0	20.4	21.1	23.3	24.5	26.5	28.3		
8	1.5	7 / 0.52	12.1	0.6	2.8	18.6	19.4	22.0	23.1			22.6	23.4	26.2	27.3				
9	1.5	7 / 0.52	12.1	0.6	2.8	20.4	21.3	23.9	25.3			24.4	25.5	28.1	29.7				
12	1.5	7 / 0.52	12.1	0.6	2.8	22.1	23.0	26.1	27.4			26.3	27.2	30.5	31.8				
19	1.5	7 / 0.52	12.1	0.6	2.8	26.2	27.3	30.9	32.4			30.5	31.6	35.5	37.1				
24	1.5	7 / 0.52	12.1	0.6	2.8	31.0	32.3					35.5	36.8						
37	1.5	7 / 0.52	12.1	0.6	2.8	35.7	37.2					40.5	42.0						

\* The rated outer diameter of cables may vary by +/- 20 % depending on the options selected.

\*\* The two pairs with general electrical screen (EG) are twisted like a quad cable.

For this product, please contact:



**SEVI KABEL**

VIA DEI MARINAI D'ITALIA, 1 - 10034 CHIVASSO (TO) - Tel. 011.910.11.12 / 011.910.67.78 - Fax 011.913.13.13 - info@sevikabel.it