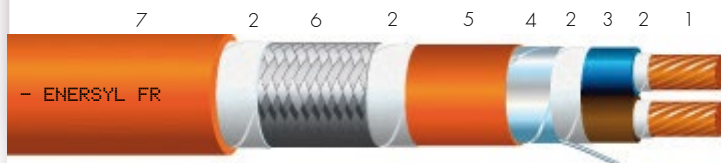


# ENERSYL® FR CONTROL

## Control cables



### Reference

- (example) ENERSYL® FR EG BG CONTROL  
19x1,5 mm<sup>2</sup>  
FR : fire resistant  
EG, BE, BR: type of electrical screen  
BG, FA: type of armour  
CONTROL: control cable  
19: number of conductors  
X, G: type of assembly: without (X)  
or with (G) an earth wire  
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 CONTROL >  
< cross-section > – 450/750V – < batch > – < year >

### Standard products

- Sheath: orange.
- Colour identification of conductors:  
< up to 5 conductors: as per HD 308 S2.  
> more than 5 conductors: white numbered.

For this product, please contact:

OMERIN division principale   
Zone Industrielle - F 63600 Ambert  
Tel. +33 (0)4 73 82 50 00 - Fax +33 (0)4 73 82 50 10  
omerin@omerin.com

OMERIN division silisol   
BP 87 - ZI du Devey - F 42000 Saint-Etienne  
Tel. +33 (0)4 77 81 36 00 - Fax +33 (0)4 77 81 37 00  
silisol@omerin.com

**omerin**  
LES CABLES DE L'EXTREME

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

### Technical characteristics

#### Thermal

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

#### Electrical

- Rated voltage: 450/750 V.
- Test voltage: 2500 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.
- 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 16.2.2.6.  
> ENERSYL® FR EX CONTROL: without electrical screen.  
> ENERSYL® FR BE EX CONTROL: with electrical screen.

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For an optimum use of the cables produced by our company, we recommend testing in real conditions. Our sales department is available for a possible provision of samples, and/or for the conditions of a complete study in our laboratories.  
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NON-SHIELDED CABLES

ARMoured CABLES

| Nominal cross-section (mm <sup>2</sup> ) | Nominal stranding | Nominal thickness of insulation (mm) | Nominal diameter of conductors (mm) | Nominal thickness of the sheath (mm) | Nominal outside diameter* (mm) | Approximate linear weight (kg/km) | Nominal thickness of the sheath (mm) | Nominal outside diameter* (mm) | Approximate linear weight (kg/km) | Max. linear resistance at 20 °C (Ω/km) |
|--|-------------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------------------|-----------------------------------|--------------------------------------|--------------------------------|-----------------------------------|--|
| 2 x 0.34                                 | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.6                                  | 5.6                            | 32                                | 1.0                                  | 8.7                            | 107                               | 57.5                                   |
| 3 x 0.34                                 | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.6                                  | 5.9                            | 40                                | 1.0                                  | 9.0                            | 119                               | 57.5                                   |
| 4 x 0.34                                 | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.6                                  | 6.4                            | 49                                | 1.0                                  | 9.5                            | 134                               | 57.5                                   |
| 5 x 0.34                                 | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.6                                  | 7.0                            | 58                                | 1.0                                  | 10.2                           | 152                               | 57.5                                   |
| 7 x 0.34                                 | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.7                                  | 7.8                            | 77                                | 1.0                                  | 11.0                           | 181                               | 57.5                                   |
| 12 x 0.34                                | 7 / 0.25          | 0.6                                  | 2.0                                 | 0.8                                  | 10.4                           | 129                               | 1.1                                  | 13.8                           | 270                               | 57.5                                   |
| 19 x 0.34                                | 7 / 0.25          | 0.6                                  | 2.0                                 | 1.0                                  | 12.5                           | 197                               | 1.2                                  | 16.1                           | 371                               | 57.5                                   |
| 24 x 0.34                                | 7 / 0.25          | 0.6                                  | 2.0                                 | 1.1                                  | 14.7                           | 250                               | 1.2                                  | 18.4                           | 457                               | 57.5                                   |
| 27 x 0.34                                | 7 / 0.25          | 0.6                                  | 2.0                                 | 1.1                                  | 15.0                           | 273                               | 1.2                                  | 18.9                           | 503                               | 57.5                                   |
| 37 x 0.34                                | 7 / 0.25          | 0.6                                  | 2.0                                 | 1.2                                  | 16.9                           | 360                               | 1.3                                  | 21.0                           | 628                               | 57.5                                   |
| 2 x 0.5                                  | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.6                                  | 5.8                            | 36                                | 1.0                                  | 8.9                            | 114                               | 36.0                                   |
| 3 x 0.5                                  | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.6                                  | 6.1                            | 46                                | 1.0                                  | 9.2                            | 127                               | 36.0                                   |
| 4 x 0.5                                  | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.6                                  | 6.7                            | 56                                | 1.0                                  | 9.8                            | 144                               | 36.0                                   |
| 5 x 0.5                                  | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.7                                  | 7.5                            | 70                                | 1.0                                  | 10.7                           | 170                               | 36.0                                   |
| 7 x 0.5                                  | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.7                                  | 8.1                            | 90                                | 1.0                                  | 11.3                           | 197                               | 36.0                                   |
| 12 x 0.5                                 | 7 / 0.30          | 0.6                                  | 2.1                                 | 0.9                                  | 11.0                           | 155                               | 1.1                                  | 14.4                           | 304                               | 36.0                                   |
| 19 x 0.5                                 | 7 / 0.30          | 0.6                                  | 2.1                                 | 1.0                                  | 13.0                           | 231                               | 1.2                                  | 16.6                           | 411                               | 36.0                                   |
| 24 x 0.5                                 | 7 / 0.30          | 0.6                                  | 2.1                                 | 1.1                                  | 15.3                           | 293                               | 1.2                                  | 19.2                           | 527                               | 36.0                                   |
| 27 x 0.5                                 | 7 / 0.30          | 0.6                                  | 2.1                                 | 1.2                                  | 15.8                           | 327                               | 1.3                                  | 19.9                           | 579                               | 36.0                                   |
| 37 x 0.5                                 | 7 / 0.30          | 0.6                                  | 2.1                                 | 1.2                                  | 17.7                           | 429                               | 1.3                                  | 21.8                           | 708                               | 36.0                                   |
| 2 x 0.75                                 | 7 / 0.37          | 0.6                                  | 2.4                                 | 0.6                                  | 6.4                            | 44                                | 1.0                                  | 9.5                            | 129                               | 24.5                                   |
| 3 x 0.75                                 | 7 / 0.37          | 0.6                                  | 2.4                                 | 0.6                                  | 6.8                            | 58                                | 1.0                                  | 9.9                            | 147                               | 24.5                                   |
| 4 x 0.75                                 | 7 / 0.37          | 0.6                                  | 2.4                                 | 0.7                                  | 7.6                            | 75                                | 1.0                                  | 10.8                           | 176                               | 24.5                                   |
| 5 x 0.75                                 | 7 / 0.37          | 0.6                                  | 2.4                                 | 0.7                                  | 8.3                            | 90                                | 1.0                                  | 11.5                           | 199                               | 24.5                                   |
| 7 x 0.75                                 | 7 / 0.37          | 0.6                                  | 2.4                                 | 0.7                                  | 9.0                            | 116                               | 1.0                                  | 12.2                           | 234                               | 24.5                                   |
| 12 x 0.75                                | 7 / 0.37          | 0.6                                  | 2.4                                 | 1.0                                  | 12.5                           | 207                               | 1.2                                  | 16.1                           | 381                               | 24.5                                   |
| 19 x 0.75                                | 7 / 0.37          | 0.6                                  | 2.4                                 | 1.1                                  | 14.7                           | 308                               | 1.2                                  | 18.4                           | 514                               | 24.5                                   |
| 24 x 0.75                                | 7 / 0.37          | 0.6                                  | 2.4                                 | 1.2                                  | 17.3                           | 390                               | 1.3                                  | 21.4                           | 663                               | 24.5                                   |
| 27 x 0.75                                | 7 / 0.37          | 0.6                                  | 2.4                                 | 1.2                                  | 17.8                           | 431                               | 1.3                                  | 21.8                           | 712                               | 24.5                                   |
| 37 x 0.75                                | 7 / 0.37          | 0.6                                  | 2.4                                 | 1.3                                  | 20.0                           | 573                               | 1.3                                  | 24.1                           | 886                               | 24.5                                   |
| 2 x 1                                    | 7 / 0.43          | 0.6                                  | 2.5                                 | 0.6                                  | 6.5                            | 49                                | 1.0                                  | 9.6                            | 135                               | 18.1                                   |
| 3 x 1                                    | 7 / 0.43          | 0.6                                  | 2.5                                 | 0.6                                  | 6.9                            | 64                                | 1.0                                  | 10.0                           | 155                               | 18.1                                   |
| 4 x 1                                    | 7 / 0.43          | 0.6                                  | 2.5                                 | 0.7                                  | 7.7                            | 84                                | 1.0                                  | 10.9                           | 187                               | 18.1                                   |
| 5 x 1                                    | 7 / 0.43          | 0.6                                  | 2.5                                 | 0.7                                  | 8.4                            | 101                               | 1.0                                  | 11.6                           | 212                               | 18.1                                   |
| 7 x 1                                    | 7 / 0.43          | 0.6                                  | 2.5                                 | 0.7                                  | 9.2                            | 132                               | 1.0                                  | 12.4                           | 252                               | 18.1                                   |
| 12 x 1                                   | 7 / 0.43          | 0.6                                  | 2.5                                 | 1.0                                  | 12.7                           | 233                               | 1.2                                  | 16.3                           | 410                               | 18.1                                   |
| 19 x 1                                   | 7 / 0.43          | 0.6                                  | 2.5                                 | 1.1                                  | 15.0                           | 349                               | 1.2                                  | 18.9                           | 579                               | 18.1                                   |
| 24 x 1                                   | 7 / 0.43          | 0.6                                  | 2.5                                 | 1.2                                  | 17.8                           | 446                               | 1.3                                  | 21.8                           | 726                               | 18.1                                   |
| 27 x 1                                   | 7 / 0.43          | 0.6                                  | 2.5                                 | 1.2                                  | 18.1                           | 490                               | 1.3                                  | 22.2                           | 775                               | 18.1                                   |
| 37 x 1                                   | 7 / 0.43          | 0.6                                  | 2.5                                 | 1.3                                  | 20.4                           | 652                               | 1.3                                  | 24.5                           | 972                               | 18.1                                   |
| 2 x 1.5                                  | 7 / 0.52          | 0.6                                  | 2.8                                 | 0.6                                  | 7.2                            | 63                                | 1.0                                  | 10.4                           | 160                               | 12.1                                   |
| 3 x 1.5                                  | 7 / 0.52          | 0.6                                  | 2.8                                 | 0.7                                  | 7.8                            | 88                                | 1.0                                  | 11.0                           | 192                               | 12.1                                   |
| 4 x 1.5                                  | 7 / 0.52          | 0.6                                  | 2.8                                 | 0.7                                  | 8.5                            | 110                               | 1.0                                  | 11.7                           | 223                               | 12.1                                   |
| 5 x 1.5                                  | 7 / 0.52          | 0.6                                  | 2.8                                 | 0.7                                  | 9.4                            | 133                               | 1.0                                  | 12.6                           | 256                               | 12.1                                   |
| 7 x 1.5                                  | 7 / 0.52          | 0.6                                  | 2.8                                 | 0.8                                  | 10.5                           | 183                               | 1.1                                  | 13.9                           | 325                               | 12.1                                   |
| 12 x 1.5                                 | 7 / 0.52          | 0.6                                  | 2.8                                 | 1.1                                  | 14.3                           | 317                               | 1.2                                  | 18.0                           | 519                               | 12.1                                   |
| 19 x 1.5                                 | 7 / 0.52          | 0.6                                  | 2.8                                 | 1.2                                  | 16.9                           | 476                               | 1.3                                  | 21.0                           | 744                               | 12.1                                   |
| 24 x 1.5                                 | 7 / 0.52          | 0.6                                  | 2.8                                 | 1.3                                  | 20.0                           | 607                               | 1.3                                  | 24.1                           | 920                               | 12.1                                   |
| 27 x 1.5                                 | 7 / 0.52          | 0.6                                  | 2.8                                 | 1.3                                  | 20.4                           | 669                               | 1.3                                  | 24.5                           | 988                               | 12.1                                   |
| 37 x 1.5                                 | 7 / 0.52          | 0.6                                  | 2.8                                 | 1.3                                  | 22.8                           | 882                               | 1.4                                  | 27.1                           | 1249                              | 12.1                                   |
| 2 x 2.5                                  | 7 / 0.67          | 0.7                                  | 3.4                                 | 0.7                                  | 8.6                            | 94                                | 1.0                                  | 11.8                           | 208                               | 7.41                                   |
| 3 x 2.5                                  | 7 / 0.67          | 0.7                                  | 3.4                                 | 0.7                                  | 9.1                            | 128                               | 1.0                                  | 12.3                           | 247                               | 7.41                                   |
| 4 x 2.5                                  | 7 / 0.67          | 0.7                                  | 3.4                                 | 0.8                                  | 10.3                           | 169                               | 1.1                                  | 13.7                           | 309                               | 7.41                                   |
| 5 x 2.5                                  | 7 / 0.67          | 0.7                                  | 3.4                                 | 0.9                                  | 11.5                           | 210                               | 1.1                                  | 14.9                           | 365                               | 7.41                                   |
| 7 x 2.5                                  | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.0                                  | 12.7                           | 284                               | 1.2                                  | 16.3                           | 460                               | 7.41                                   |
| 12 x 2.5                                 | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.2                                  | 17.0                           | 477                               | 1.3                                  | 21.1                           | 747                               | 7.41                                   |
| 19 x 2.5                                 | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.3                                  | 20.2                           | 727                               | 1.3                                  | 24.3                           | 1043                              | 7.41                                   |
| 24 x 2.5                                 | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.3                                  | 23.6                           | 907                               | 1.4                                  | 27.9                           | 1287                              | 7.41                                   |
| 27 x 2.5                                 | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.3                                  | 24.1                           | 1004                              | 1.4                                  | 28.4                           | 1331                              | 7.41                                   |
| 37 x 2.5                                 | 7 / 0.67          | 0.7                                  | 3.4                                 | 1.4                                  | 27.2                           | 1311                              | 1.5                                  | 31.7                           | 1796                              | 7.41                                   |

\* The rated outer diameter of cables may vary by +/- 15% depending on the options selected.

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