

## Thermocouple Extension and compensating cables









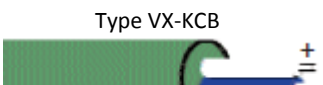

Thermocouple extension and compensating cables are designed for interconnection between thermocouple probes and control instrumentation. They are generally available in the following types.

- Type (1) Unarmoured cables with conductors insulated with PVC and twisted together in pairs, sheathed overall with PVC.
- Type (2) Armoured cables with conductors insulated with PVC and twisted together in pairs, PVC bedding, Galvanised steel wire armour and sheathed overall with PVC.
- Type (3) Lead sheathed and armoured cables with conductors insulated with PVC and twisted together in pairs, PVC bedded, Lead alloy sheathed, PVC bedded, galvanised steel wire armour and sheathed overall with PVC.

All of the above types of cable can be supplied unscreened or screened (Individually, collectively or both) with an Aluminium / Polyester tape screen incorporating tinned copper drain wires.

Alternative insulation and sheathing materials can also be used, details available upon request.

Colour Code Table

| Conductor combinations |                  | BS1843  | BSEN 60584.3   | Thermocouple     | Cable            |              |
|------------------------|------------------|---|--|------------------|------------------|--------------|
| +                      | -                |   |  | +                | -                |              |
| Copper                 | Constantan       |    |    | Copper           | Constantan       | Extension    |
| Iron                   | Constantan       |  |  | Iron             | Constantan       | Extension    |
| Nickel Chromium        | Nickel Aluminium |  |  | Nickel Chromium  | Nickel Aluminium | Extension    |
| Copper                 | Constantan       |  |  | Nickel Chromium  | Nickel Aluminium | Compensating |
| Copper                 | Copper Nickel    |  |  | Platinum Rhodium | Platinum         | Compensating |

IEC 60584 Tolerances for extension and compensating cables

| Type   | Tolerance 1     | Tolerance 2      | Cable temperature range | Measuring junction temperature |
|--------|-----------------|------------------|-------------------------|--------------------------------|
| TX     | ±30µV (± 0.5°C) | ±60µV (± 1.0°C)  | -25°C - + 100°C         | 300°C                          |
| JX     | ±85µV (± 1.5°C) | ±140µV (± 2.5°C) | -25°C - + 200°C         | 500°C                          |
| KX     | ±60µV (± 1.5°C) | ±100µV (± 2.5°C) | -25°C - + 200°C         | 900°C                          |
| VX-KCB | -               | ±140µV (± 2.5°C) | 0°C - + 100°C           | 900°C                          |
| RCA    | -               | ±30µV (± 2.5°C)  | 0°C - + 100°C           | 1000°C                         |
| SCA    | -               | ±30µV (± 2.5°C)  | 0°C - + 100°C           | 1000°C                         |

Note: Cable temperature may be restricted to figures lower than those shown in the table because temperature limitations imposed by the insolation.



## Thermocouple Single Pair – TX, JX, KX, VX, KC

**Minimum bending radius:** Unscreened and screened – 4 x overall diameter  
 Screened with armour – 6 x overall diameter  
 Screened with lead and armour – 12 x overall diameter

**Operating temperature:** Maximum 105°C, Minimum -30°C, Minimum bending 0°C

### Unscreened (Type 1)

PVC insulated / PVC sheathed – Flat

| Size sq.mm | Stranding mm | RT of insulation mm | Diameter over laid up cores mm | RT of outer sheath mm | Nominal overall diameter mm | Approx. weight kg/km | Type | Colour | BATT Part No |
|------------|--------------|---------------------|--------------------------------|-----------------------|-----------------------------|----------------------|------|--------|--------------|
| 0.22       | 7/.2         | 0.5                 | 1.6 x 3.2                      | 0.8                   | 3.2 x 4.8                   | 23                   | -    | -      | -            |
| 0.5        | 16/.2        | 0.6                 | 2.1 x 4.3                      | 0.8                   | 3.7 x 5.9                   | 35                   | TX   | Blue   | 52109        |
| 0.5        | 16/.2        | 0.6                 | 2.1 x 4.3                      | 0.8                   | 3.7 x 5.9                   | 35                   | KX   | Green  | 52183        |
| 0.5        | 16/.2        | 0.6                 | 2.1 x 4.3                      | 0.8                   | 3.7 x 5.9                   | 35                   | TX   | Brown  | 52018        |
| 0.75       | 24/.2        | 0.6                 | 2.3 x 4.7                      | 0.8                   | 3.9 x 6.3                   | 42                   | KX   | Green  | 52196        |
| 0.75       | 24/.2        | 0.6                 | 2.3 x 4.7                      | 0.8                   | 3.9 x 6.3                   | 42                   | KX   | Red    | 52045        |
| 1.0        | 32/.2        | 0.6                 | 2.5 x 5.0                      | 0.8                   | 4.1 x 6.7                   | 50                   | -    | -      | -            |
| 1.3        | 1/1.29       | 0.6                 | 2.5 x 5.0                      | 0.8                   | 4.1 x 6.6                   | 55                   | -    | -      | -            |

### Screened (Type 1)

PVC insulated / CAM (Collective Aluminium Mylar) screen including drain wire / PVC sheathed - circular

| Size sq.mm | Stranding mm | RT of insulation mm | Diameter over screen mm | RT of outer sheath mm | Nominal overall diameter mm | Approx. weight kg/km | Type | Colour | BATT Part No |
|------------|--------------|---------------------|-------------------------|-----------------------|-----------------------------|----------------------|------|--------|--------------|
| 0.5        | 1 / 0.8      | 0.5                 | 3.9                     | 0.8                   | 5.5                         | 35                   | -    | -      | -            |
| 0.5        | 16 / 0.2     | 0.6                 | 4.8                     | 0.8                   | 6.4                         | 42                   | KCB  | Green  | 52185        |
| 0.5        | 16 / 0.2     | 0.6                 | 4.8                     | 0.8                   | 6.4                         | 42                   | KX   | Red    | 82002        |
| 0.5        | 16 / 0.2     | 0.6                 | 4.8                     | 0.8                   | 6.4                         | 42                   | TX   | Brown  | 52182        |
| 0.5        | 16 / 0.2     | 0.6                 | 4.8                     | 0.8                   | 6.4                         | 42                   | TX   | Blue   | 52107        |
| 0.5        | 16 / 0.2     | 0.6                 | 4.8                     | 0.8                   | 6.4                         | 42                   | VX   | Red    | 52108        |
| 0.75       | 24 / 0.2     | 0.6                 | 5.2                     | 0.8                   | 6.8                         | 49                   | -    | -      | -            |
| 1.3        | 1 / 1.30     | 0.6                 | 5.3                     | 0.8                   | 6.9                         | 59                   | KX   | Yellow | 52077        |
| 1.3        | 1 / 1.30     | 0.6                 | 5.3                     | 0.8                   | 6.9                         | 59                   | KCB  | Yellow | 52081        |
| 1.3        | 1 / 1.30     | 0.6                 | 5.3                     | 0.8                   | 6.9                         | 59                   | VX   | Blue   | 52010        |
| 1.3        | 1 / 1.30     | 0.6                 | 5.3                     | 0.8                   | 6.9                         | 59                   | KCB  | Green  | 52201        |

### Screened and armoured (Type 2)

PVC insulated / CAM (Collective Aluminium Mylar) screen including drain wire / PVC extruded bedded / Steel wire armour / PVC sheathed – circular

| Size sq.mm | Stranding mm | RT of insulation mm | Diameter over bedding mm | Diameter of armour wire | Diameter over armour mm | RT of outer sheath mm | Nominal overall diameter mm | Approx. weight kg/km | Type | Colour | BATT Part No |
|------------|--------------|---------------------|--------------------------|-------------------------|-------------------------|-----------------------|-----------------------------|----------------------|------|--------|--------------|
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 0.9                     | 7.3                     | 1.0                   | 9.3                         | 142                  | TX   | Brown  | 52065        |
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 0.9                     | 7.3                     | 1.0                   | 9.3                         | 142                  | VX   | Red    | 52117        |
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 0.9                     | 7.3                     | 1.0                   | 9.3                         | 142                  | VX   | Red    | 52111        |
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 0.9                     | 7.3                     | 1.0                   | 9.3                         | 142                  | KCB  | Blue   | 52177        |
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 0.9                     | 7.3                     | 1.0                   | 9.3                         | 142                  | KX   | Green  | 52200        |
| 0.75       | -            | -                   | -                        | -                       | -                       | -                     | -                           | -                    | TX   | Brown  | 52206        |
| 0.75       | -            | -                   | -                        | -                       | -                       | -                     | -                           | -                    | KX   | Green  | 52171        |
| 1.3        | 1 / 1.29     | 0.6                 | 6.9                      | 0.9                     | 8.7                     | 1.0                   | 10.7                        | 185                  | JX   | Black  | 52015        |
| 1.3        | 1 / 1.29     | 0.6                 | 6.9                      | 0.9                     | 8.7                     | 1.0                   | 10.7                        | 185                  | KCB  | Green  | 52194        |
| 1.3        | 1 / 1.29     | 0.6                 | 6.9                      | 0.9                     | 8.7                     | 1.0                   | 10.7                        | 185                  | TX   | Brown  | 52016        |
| 1.3        | 1 / 1.29     | 0.6                 | 6.9                      | 0.9                     | 8.7                     | 1.0                   | 10.7                        | 185                  | KX   | Green  | 52187        |



### Screened with lead sheath and armour (Type 3)

PVC insulated / CAM (Collective Aluminium Mylar) screen including drain wire / PVC extruded bedded / lead sheathed / PVC extruded bedded / steel wire armoured / PVC sheathed - circular

| Size sq.mm | Stranding mm | RT of insulation mm | Diameter over bedding mm | Diameter over lead mm | Diameter over armour mm | RT of outer sheath mm | Nominal overall diameter mm | Approx. weight kg/km | Type | Colour | BATT Part No |
|------------|--------------|---------------------|--------------------------|-----------------------|-------------------------|-----------------------|-----------------------------|----------------------|------|--------|--------------|
| 0.5        | 1 / 0.8      | 0.5                 | 5.5                      | 7.7                   | 9.5                     | 1.1                   | 11.7                        | 467                  | -    | -      | -            |
| 1.3        | 1 / 1.29     | 0.6                 | 6.9                      | 9.1                   | 10.9                    | 1.1                   | 13.1                        | 563                  | KX   | Red    | 52167        |

### Thermocouple Multi Pair – TX, JX, KX, VX, KC

**Minimum bending radius:** 6 x overall diameter (Type 2)  
12 x overall diameter (Type 3)

**Operating temperature:** Maximum 105°C, Minimum -10°C, Minimum bending 0°C (Type 2)  
Maximum 105°C, Minimum 30°C, Minimum bending 0°C (Type 3)

### Screened and armoured (Type 2)

PVC insulated / CAM (Collective Aluminium Mylar) screen including drain wire / PVC extruded bedded / steel wire armour / PVC sheathed – Circular

#### 0.5sqmm (16 / 0.2mm)

| No of pairs | Nominal diameter laid up pairs mm | Nominal diameter collective screen mm | RT of bedding mm | Diameter over bedding mm | Diameter of armour wire mm | Diameter over armour mm | Nominal overall diameter mm | Approx weight kg/km | Type | Colour | BATT Part No |
|-------------|-----------------------------------|---------------------------------------|------------------|--------------------------|----------------------------|-------------------------|-----------------------------|---------------------|------|--------|--------------|
| 2           | 4.3                               | 4.7                                   | 0.8              | 6.8                      | 0.9                        | 8.6                     | 11.2                        | 260                 | -    | -      | -            |
| 5           | 9.9                               | 10.9                                  | 1.1              | 13.1                     | 0.9                        | 14.9                    | 17.9                        | 470                 | VX   | Green  | 52008        |
| 10          | 13.8                              | 14.8                                  | 1.2              | 17.2                     | 1.25                       | 19.7                    | 22.9                        | 810                 | -    | -      | -            |
| 15          | 16.2                              | 17.2                                  | 1.3              | 19.8                     | 1.6                        | 23.0                    | 26.4                        | 1160                | -    | -      | -            |
| 20          | 18.7                              | 19.7                                  | 1.3              | 22.3                     | 1.6                        | 25.5                    | 29.1                        | 1370                | -    | -      | -            |
| 30          | 22.9                              | 23.9                                  | 1.5              | 26.9                     | 1.6                        | 30.1                    | 33.9                        | 1760                | -    | -      | -            |
| 50          | 29.5                              | 30.5                                  | 1.7              | 33.9                     | 2.0                        | 37.9                    | 42.1                        | 2730                | -    | -      | -            |

#### 0.75sq.mm (24/0.2mm)

| No of pairs | Nominal diameter laid up pairs mm | Nominal diameter collective screen mm | RT of bedding mm | Diameter over bedding mm | Diameter of armour wire mm | Diameter over armour mm | Nominal overall diameter mm | Approx weight kg/km | Type | Colour | BATT Part No |
|-------------|-----------------------------------|---------------------------------------|------------------|--------------------------|----------------------------|-------------------------|-----------------------------|---------------------|------|--------|--------------|
| 2           | 4.7                               | 5.1                                   | 0.8              | 7.3                      | 0.9                        | 9.1                     | 11.9                        | 310                 | -    | -      | -            |
| 5           | 10.4                              | 11.1                                  | 1.2              | 14.3                     | 1.25                       | 16.8                    | 19.8                        | 710                 | -    | -      | -            |
| 10          | 13.6                              | 14.6                                  | 1.3              | 18.7                     | 1.6                        | 21.9                    | 25.3                        | 1200                | -    | -      | -            |
| 15          | 17.5                              | 18.6                                  | 1.3              | 21.4                     | 1.6                        | 24.6                    | 28.2                        | 1500                | -    | -      | -            |
| 20          | 19.9                              | 21.0                                  | 1.5              | 24.5                     | 1.6                        | 27.7                    | 31.3                        | 1700                | -    | -      | -            |
| 30          | 23.2                              | 24.5                                  | 1.7              | 29.5                     | 2.0                        | 33.5                    | 37.5                        | 2500                | -    | -      | -            |
| 50          | 31.0                              | 32.5                                  | 2.0              | 37.4                     | 2.0                        | 42.4                    | 47.0                        | 3300                | -    | -      | -            |

#### 1.5sq.mm (1/1.38mm)

| No of pairs | Nominal diameter laid up pairs mm | Nominal diameter collective screen mm | RT of bedding mm | Diameter over bedding mm | Diameter of armour wire mm | Diameter over armour mm | Nominal overall diameter mm | Approx weight kg/km | Type | Colour | BATT Part No |
|-------------|-----------------------------------|---------------------------------------|------------------|--------------------------|----------------------------|-------------------------|-----------------------------|---------------------|------|--------|--------------|
| 1           | -                                 | 5.4                                   | 1.0              | 7.6                      | 0.9                        | 9.4                     | 12.4                        | 290                 | KX   | Yellow | 52140        |

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### Individual and collective pair screened and armoured (Type 2)

PVC insulated – IAM (Individual Aluminium Mylar) pair screened including drain wire / CAM (Collective Aluminium Mylar) screen including drain wire / PVC extruded bedded / Steel wire armoured / PVC sheathed.

#### 0.5sqmm (1/0.8mm)

| No of pairs | Nominal diameter laid up pairs mm | Nominal diameter collective screen mm | RT of bedding mm | Diameter over bedding mm | Diameter of armour wire mm | Diameter over armour mm | Nominal overall diameter mm | Approx weight kg/km | Type | Colour | BATT Part No |
|-------------|-----------------------------------|---------------------------------------|------------------|--------------------------|----------------------------|-------------------------|-----------------------------|---------------------|------|--------|--------------|
| 2           | 7.7                               | 8.7                                   | 0.8              | 10.3                     | 0.9                        | 12.1                    | 14.9                        | 380                 | VX   | Red    | 52085        |
| 2           | 7.7                               | 8.7                                   | 0.8              | 10.3                     | 0.9                        | 12.1                    | 14.9                        | 380                 | TX   | Brown  | 52020        |
| 2           | 7.7                               | 8.7                                   | 0.8              | 10.3                     | 0.9                        | 12.1                    | 14.9                        | 380                 | TX   | Blue   | 52086        |
| 4           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | KCB  | Blue   | 52179        |
| 5           | 10.1                              | 11.1                                  | 1.2              | 13.5                     | 1.25                       | 16.0                    | 19.0                        | 660                 | -    | -      | -            |
| 6           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | TX   | Blue   | 52089        |
| 6           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | KCB  | Blue   | 52125        |
| 6           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | KX   | Green  | 52204        |
| 8           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | KCB  | Blue   | 52180        |
| 8           | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | TX   | Blue   | 82087        |
| 10          | 14.9                              | 15.9                                  | 1.2              | 18.3                     | 1.25                       | 20.8                    | 24.2                        | 950                 | KC   | Green  | 54048        |
| 12          | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | VX   | Blue   | 82176        |
| 12          | -                                 | -                                     | -                | -                        | -                          | -                       | -                           | -                   | KC   | Green  | 82184        |
| 15          | 14.9                              | 16.9                                  | 1.3              | 19.5                     | 1.6                        | 22.7                    | 27.3                        | 1291                | -    | -      | -            |
| 20          | 19.9                              | 20.9                                  | 1.3              | 23.5                     | 1.6                        | 26.7                    | 30.3                        | 1560                | KC   | Green  | 52049        |
| 30          | 23.9                              | 24.9                                  | 1.5              | 27.9                     | 1.6                        | 31.1                    | 34.9                        | 1990                | KC   | Green  | 52021        |
| 50          | 31.1                              | 32.1                                  | 2.0              | 36.1                     | 2.0                        | 40.1                    | 44.5                        | 3200                | KC   | Green  | 85188        |

### Individual and collective pair screened, lead sheathed and armoured (Type 3)

PVC insulated – IAM (Individual Aluminium Mylar) pair screened including drain wire / CAM (Collective Aluminium Mylar) screen including drain wire / PVC extruded bedded / Lead sheathed / PVC extruded bedded / Steel wire armoured / PVC sheathed.

#### 0.5sqmm (1/0.8mm)

| No of pairs | Nom dia over laid up cores mm | Nom dia over collective screen mm | RT of inner bedding mm | Dia over inner bedding mm | RT of lead alloy sheath mm | Dia over lead alloy sheath mm | RT of outer bedding mm | Dia of outer bedding mm | Dia of armour wire mm | Dia over armour mm | RT of outer sheath mm | Nom overall dia mm | Weight kg/km | Type | Colour | BATT Part No |
|-------------|-------------------------------|-----------------------------------|------------------------|---------------------------|----------------------------|-------------------------------|------------------------|-------------------------|-----------------------|--------------------|-----------------------|--------------------|--------------|------|--------|--------------|
| 2           | 1.5                           | -                                 | -                      | -                         | -                          | -                             | -                      | -                       | -                     | -                  | -                     | 12.4               | 290          | KX   | Yellow | 52140        |
| 2           | 7.5                           | 0.9                               | 10.3                   | 1.1                       | 12.5                       | 0.8                           | 14.1                   | 1.25                    | 16.6                  | 1.5                | 16.6                  | 19.6               | 1140         | -    | -      | -            |
| 5           | 10.1                          | 1.2                               | 13.5                   | 1.1                       | 14.7                       | 0.8                           | 17.3                   | 1.25                    | 19.8                  | 1.6                | 19.8                  | 23.0               | 1450         | -    | -      | -            |
| 10          | 14.9                          | 1.2                               | 18.3                   | 1.2                       | 20.7                       | 1.0                           | 22.7                   | 1.6                     | 25.9                  | 1.7                | 25.9                  | 29.3               | 2300         | VX   | Blue   | 52039        |
| 20          | 19.9                          | 1.3                               | 23.5                   | 1.4                       | 26.3                       | 1.2                           | 28.7                   | 2.0                     | 32.7                  | 1.9                | 32.7                  | 36.5               | 3580         | VX   | Blue   | 52041        |
| 30          | 23.9                          | 1.5                               | 27.9                   | 1.5                       | 30.9                       | 1.2                           | 33.3                   | 2.0                     | 37.3                  | 2.0                | 37.3                  | 41.3               | 4470         | -    | -      | -            |
| 50          | 32.1                          | 2.0                               | 36.1                   | 1.8                       | 39.7                       | 1.4                           | 42.5                   | 2.5                     | 47.5                  | 2.5                | 47.5                  | 52.1               | 6780         | -    | -      | -            |

Additional sizes and parts available, please contact your local sales team for further information.