Habiatherm

Thermocouple cables

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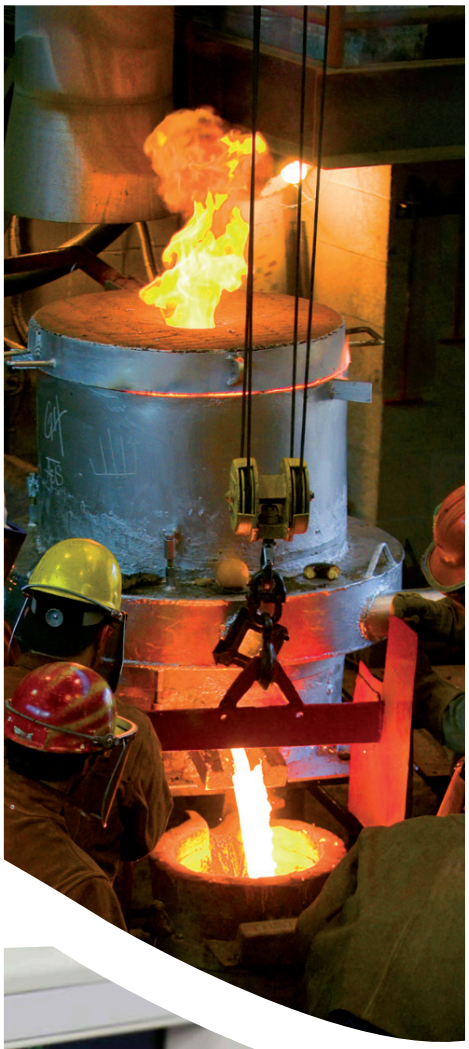
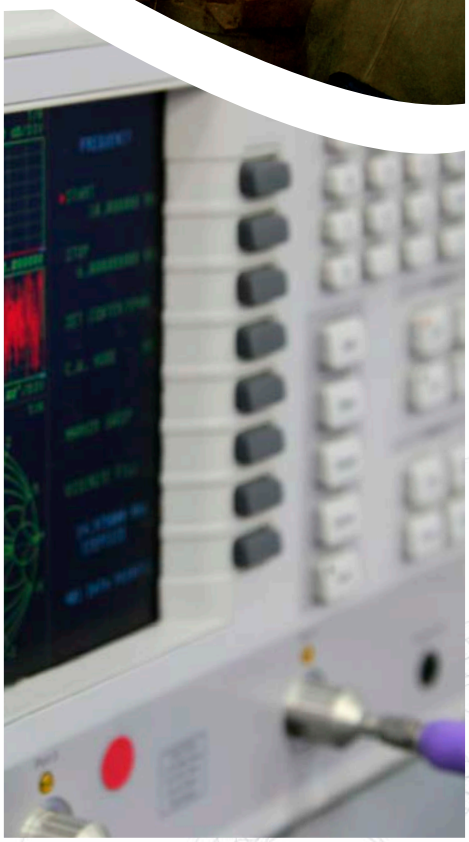




Habiatherm Custom Design Cables

Thermocouples are widely used to measure temperature. This works on the thermoelectric effect; whereby a metal will generate a voltage when heated. By taking the differential voltage generated when two different metals in the same circuit are heated it is possible to measure changes in temperature as a change in voltage.

In order to get an accurate measurement, expensive metals are commonly used within the temperature probe itself. For long cable runs however, the cost of these metals becomes prohibitive and for that reason Habia Cable manufacture a range of extension and compensation cables. As standard, Habia Cable offers Class 1 thermocouples which provide the tightest tolerance and most accurate measurements.

Thermocouple cables are split into two different types. Extension cables exhibit the same voltage and temperature characteristics as the thermocouple over a limited range. By using similar metals to the thermocouple they have the advantage of minimising any mismatch in the circuit. The standard types supplied by Habia Cable are:

EX Uses a Nickel Chromium (Chromel) positive leg with a Copper Nickel (Constantan) negative leg for measurements with a tolerance of ±120µV (Class 1) or ±200µV (Class 2).

JX Uses an Iron positive leg with a Copper Nickel (Constantan) negative leg for measurements with a tolerance of ±85µV (Class 1) or ±140µV (Class 2).

KX Uses a Nickel Chromium (or Chromel) positive leg with a Nickel Aluminium (Alumel) negative leg. Some standards allow for the use of a simple Nickel leg to be used as the negative for measurements with a tolerance of ±60µV (Class 1) or ±100µV (Class 2).

NX Uses a Nickel Chromium Silicone (Nicrosil) positive leg with a Nickel Silicone (NiSil) negative leg for measurements with a tolerance of ±60µV (Class 1) or ±100µV (Class 2).

TX Uses a Copper positive leg with a Copper Nickel (Constantan) negative leg for measurements with a tolerance of ±30µV (Class 1) or ±60µV (Class 2).

Compensation cables also exhibit similar voltage and temperature characteristics as the thermocouple over a limited range and they offer a cost saving over both the thermocouple and extension cables; however as they use dissimilar metals they are less precise than the extension cables:

KCB Uses a Copper positive leg with a Copper Nickel (Constantan) negative leg for measurements with a tolerance of ±100µV (Class 2 only).

RCA/SCA Uses a Copper positive leg with a Copper Nickel (Constantan) negative leg for measurements with a tolerance of ±30µV (Class 2 only).

Enquiries should be directed to our local sales offices and contact details can be found on final page of this product guide.

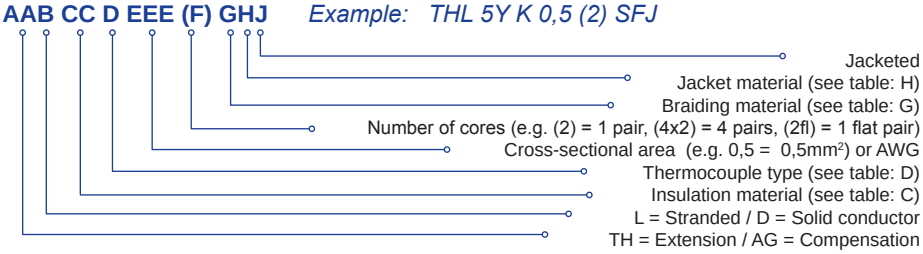
Habiatherm extension and compensation cables

Classes:

With temperature measurement, the essential factor is accuracy. Therefore there are three different standard classes for the conductors:
- Class 1 conductors offer the best measuring range for high temperature measurement.
- Class 2 conductors offer a lower cost, but cannot measure over such a tight temperature range.
- Class 3 conductors are the most accurate option for low temperature measurement.

Cable description system:

AAB CC D EEE (F) GHJ *Example: THL 5Y K 0,5 (2) SFJ*



Habiatherm Custom Design Cables

As a custom design cable manufacturer, Habia Cable is able to use any of our wide range of materials, including Habiaflame² as Habiatherm cables. We are also able to combine Habiatherm components within other multicore cables, reducing the need for multiple cable runs.

Although there are many combinations of cores, screens and jackets that can be produced, the typical extension or compensation cable will be produced as a twin core (positive and negative) cable with stranded conductors. Habia Cable will endeavour to propose a design that lines up with an existing standard such as NEMA-HP3 for PTFE wires, however it is also possible for custom thicknesses to be used. With this in mind, Habia Cable have developed a simple to use part numbering system to identify the materials and basic construction of a custom cable. Details of this system can be found above and in the table below.

Cable Description Options	
insulation material (C)	
material	code
PTFE	5Y
FEP	6Y
ETFE	7Y
TWI 205	8Y
PFA	PFA
RV	RV

thermocouple type (D)	
E	NiCr / CuNi
J	Fe / CuNi
K	NiCr / Ni
N	NiCrSil / NiSi
T	Cu / CuNi
S	E-Cu / S-Cu

braiding material (G)	
metal	code
Tin Plated Copper	T
Silver Plated Copper	S
Nickel Plated Copper	N
Stainless Steel	V
Aluminium foil	A

jacket material (H)	
material	code
PTFE	T
FEP	F
ETFE	Z
PFA	P
HFR 150	Si
TWI 205	K

Note: All dimensions in mm and ±4% unless stated Date: 2009-05-30 Created: CJV Approved: AR / TBD Reference: HTherm_EC_01

Habiatherm national and international colour codes

Standards:

There are many national and international standards that cover the supply of extension and compensation cables.
Habia Cable will recommend the use of the International Standard: IEC 60584.3: 1989, however the company also recognises the British, German, American and Japanese standards and these colour codes can be produced at no extra cost.

Colour coding					
Extension Cables	International IEC 60584.3: 1989	British BS 1843	German DIN 43714	American ANSI MC96.1	Japanese JISC 1601
EX (NiCr / CuNi)					
JX (Fe / CuNi)					
KX (NiCr / Ni)					
NX (NiCrSil / NiSi)					
TX (Cu / CuNi)					

Extension Cables	International IEC 60584.3: 1989	British BS 1843	German DIN 43714	American ANSI MC96.1	Japanese JISC 1601
KCB (Cu / CuNi)					
RCA / SCA (Cu / CuNi)					

Note: All dimensions in mm and ±4% unless stated Date: 2009-05-30 Created: CJV Approved: AR / TBD Reference: HTherm_CC_01