NOVA
CABLE CLEATS &
TREFOIL CLAMPS

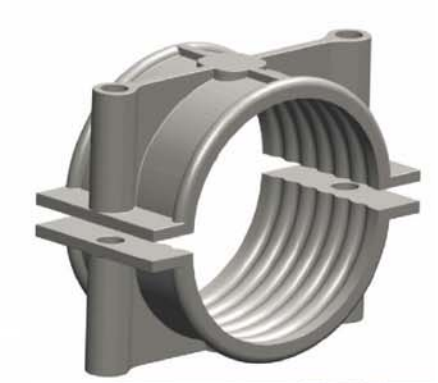


Table Of Contents

INTRODUCTION

It has been over a decade that we have been relentlessly pursuing the vision to build a better tomorrow by providing the world with a better today. Having acquired significant insights into customer needs, we have evolved and adapted to the newer realities, delivering to the society at large an experience which they cherish and pleasure through our products. We, Nova Cable Accessories are one of the most respected and valued manufacturers of quality electrical engineering products.

QUALITY

At Nova Cable Accessories, quality always comes first. Our endeavor has always been to go a step ahead of the standard norms of checks and requirements, to bring you high-quality products, which pass the test of customer satisfaction anywhere in the world. The commitment starts from the very first step ie procuring the highest quality raw materials. The raw material goes through a Stringent tests and checks prior to finally approved for manufacturing. The state-of-the-art plant houses some of the latest and the advanced machinery, procured from the best manufactures of the world. At each and every step of the production process, there are several stringent check points performed by quality inspectors & technicians who certify the process. Then only it goes further into the production line. Utmost attention is given to details at all stages of production. We adhere to all the standards and specifications laid down by the known and certified International and National councils. The result is a range of world class products which are consistent and reliable, and deliver total customer satisfaction.

WHY TO USE A CABLE CLEAT?

Nova cable cleats are designed to ensure the retention and support of cables and conductors, reducing the load that the cable may be exposed to under its own weight.

By ensuring the cables are fixed, retained and supported correctly this protects all of the cable terminations by reducing the mechanical load exerted on them. Nova cable cleats are designed and tested so that in the event of short circuit fault conditions, they will contain the cables without causing damage; enabling the circuit to be restored once the fault has been rectified.

The latest standard IEC61914 specifies requirements and tests for cable cleats and intermediate restraints, used for securing cable in electrical installations. Nova cable cleats provide the necessary levels of resistance to electromechanical forces, where declared, and in addition achieve the following safety measures:

- Support cables and conductors.
- Reduce the mechanical load the cable may be exposed to under its own weight.
- Reduce the mechanical load the cable termination may be exposed to.
- Reduce the mechanical load a cable may be exposed to due to electrical fault conditions.

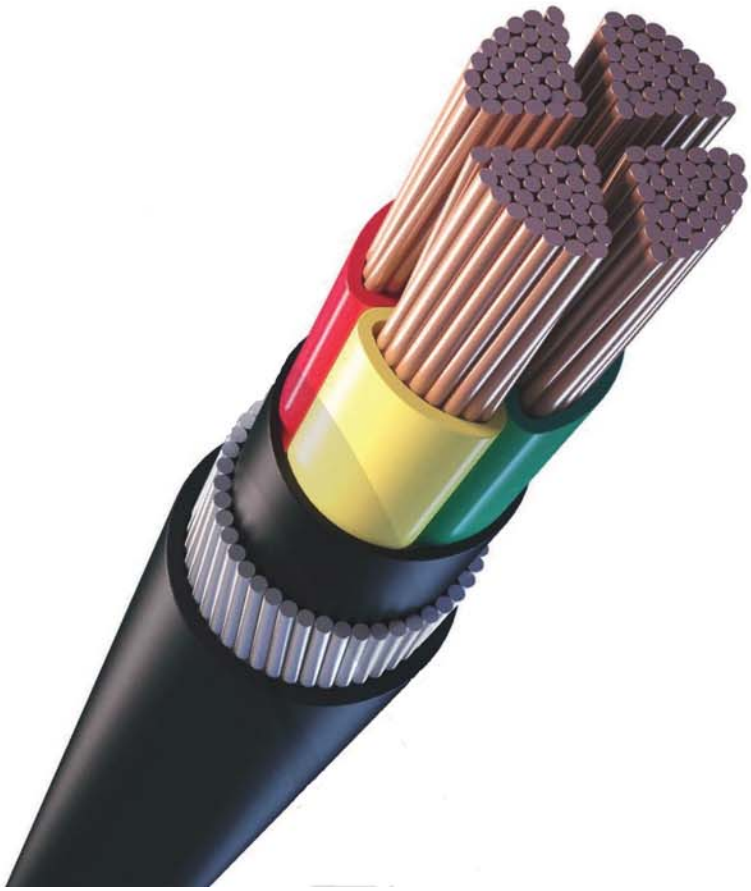
Cable cleats are for those whose core values include operating responsibly, safeguarding people, protecting the environment, and delivering on their zero harm HSE policies.

BS7671:2008 IET Wiring Regulations Seventeenth Edition:

'522.8.3 – The radius of every bend in a wiring system shall be such that conductors or cables do not suffer damage and terminations are not stressed.'

'522.8.4 – Where the conductors or cables are not supported continuously due to the method of installation, they shall be supported by suitable means at appropriate intervals in such a manner that the conductors or cables do not suffer damage by their own weight.'

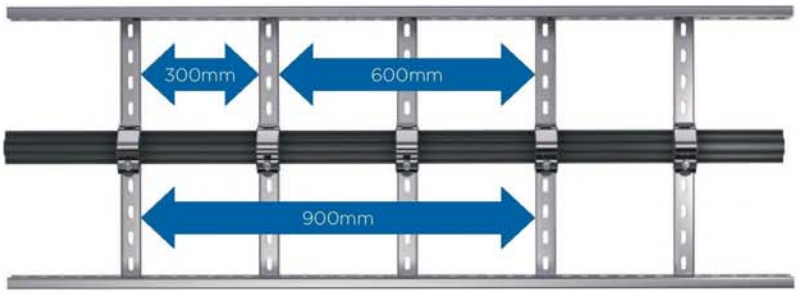
'522.8.5 – Every cable or conductor shall be supported in such a way that it is not exposed to undue mechanical strain and so that there is no appreciable mechanical strain on the terminations of the conductors, account being taken of mechanical strain imposed by the supported weight of the cable or conductor itself.'



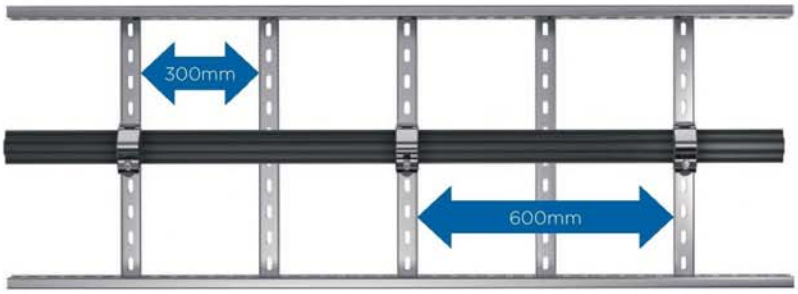
CABLE CLEAT SPACING

The following illustration shows the tensile strength required by each cable cleat depending upon fixing centres/intervals.

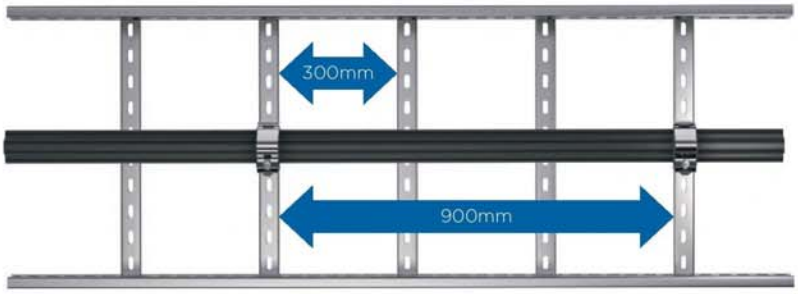
F_t = 0.17 i_p^2 / S
F_t = maximum force on the cable conductor (N/m)



0.17 (190 x 190) / (36 / 1000) = 170,477.22 N/m
Cable Ø = 36mm i_p = 190kA
mounting intervals: 300mm (x 0.3) = 51,141.67N per cable cleat



0.17 (190 x 190) / (36 / 1000) = 170,477.22 N/m
Cable Ø = 36mm i_p = 190kA
mounting intervals: 600mm (x 0.6) = 102,283.33N per cable cleat.
Each cable cleat in this configuration must restrain two times the force of those in the above configuration (300mm).



0.17 (190 x 190) / (36 / 1000) = 170,477.22 N/m
Cable Ø = 36mm i_p = 190kA
mounting intervals: 900mm (x 0.9) = 153,424.00N per cable cleat.
Each cable cleat in this configuration must restrain one-and-a-half times the force of those in the above configuration (600mm), or three times the force of those in the first configuration (300mm).

CABLE CLEAT SELECTION

Cable cleat selection takes into account numerous factors listed below, and ideally if Nova Products can be supplied with the following: cable construction – type, ratings and diameter, system design, support structure and environment; it will then be possible to provide further advice on the correct type of cable cleat, and also the cable cleat spacing requirements for a specific application.

CABLE – WHAT TYPE OF CABLE IS BEING USED?

DIAMETER

The overall diameter of the cable will allow Nova Products to size the correct cable cleat and calculate the short circuit forces the cable cleat may be subjected to under fault conditions.

PERFORMANCE

The cable may have fire performance (FR), or Low Smoke & Fume or Zero Halogen (LSF / LS0H / LSZH) requirements that the cable cleat would also have to adhere to.

DESIGN - OVERVIEW OF THE CABLE MANAGEMENT SYSTEM

MECHANICAL LOAD

All Nova cable cleats have been tested for both axial and lateral loads, this will ensure they will be capable of supporting the weight of the cables(s).

SHORT CIRCUIT RATING – kA PEAK FAULT OR r.m.s

What is the maximum peak fault (kA) the cable may be subjected to under short circuit conditions? Based upon the specified cable the short circuit rating can be calculated with use of the standard IEC 61914 to give the maximum forces the cable cleat will need to be able to withstand during a short circuit fault.

CABLE CONFIGURATION - FLAT FORM / PARALLEL OR TREFOIL FORMATION?

The cable configuration of the system will define the type of cable cleat required; either a single cable cleat, a trefoil cable cleat, a quad cable cleat, or this may even indicate that a bespoke cable cleat may be required which Nova Products will design, test, and certify to suit the cable management system requirements of its client.

CABLE RUN LENGTH – HOW MANY CABLE CLEATS ARE REQUIRED?

Whilst the spacing requirements for cable cleats will be subject to cable formation, cable diameter, and short circuit rating, the overall cable run length will give the correct number of cable cleats required for the installation. Cable runs that turn through 90° must also be noted as the cable cleat spacing will be reduced throughout these bends.

WHAT IS A SHORT CIRCUIT?

A short circuit is an electrical circuit that allows a current to travel along an unintended path, often where essentially no (or a very low) electrical impedance is encountered.

Impedance is the measure of opposition that a circuit presents to a current when a voltage is applied. This unintended or abnormal path of negligible impedance can be between live conductors, or between a live conductor and an earth, which have a difference in potential under normal operating conditions.

When electric current flows in a conductor, it creates a magnetic field. In the case of alternating current the magnetic field varies with that current. This magnetic field affects adjacent conductors in two ways: the first is to induce eddy currents, and the second is to induce an electromagnetic field.

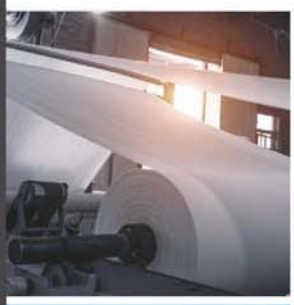
Under Short circuit conditions the magnetic fields around the conductors will generate mechanical forces between those conductors. These forces may be considerable and will be greater the closer together the conductors are.

Whilst direct current creates a field, this field is steady and its main effect is to magnetise nearby susceptible objects.

EDDY CURRENTS (FOUCAULT)

Eddy currents are electric currents induced in conductors when a conductor is exposed to a changing magnetic field.

Eddy currents are induced circumferentially around the current carrying conductors. For this reason, the use of steel wire or steel tape armour is not permitted in single core cables used in a.c. circuits. Similarly it is strongly recommended that cast iron or ferromagnetic cable cleats are not used in conjunction with individual single core cables deployed in a.c. circuits.



SHORT CIRCUIT TESTING

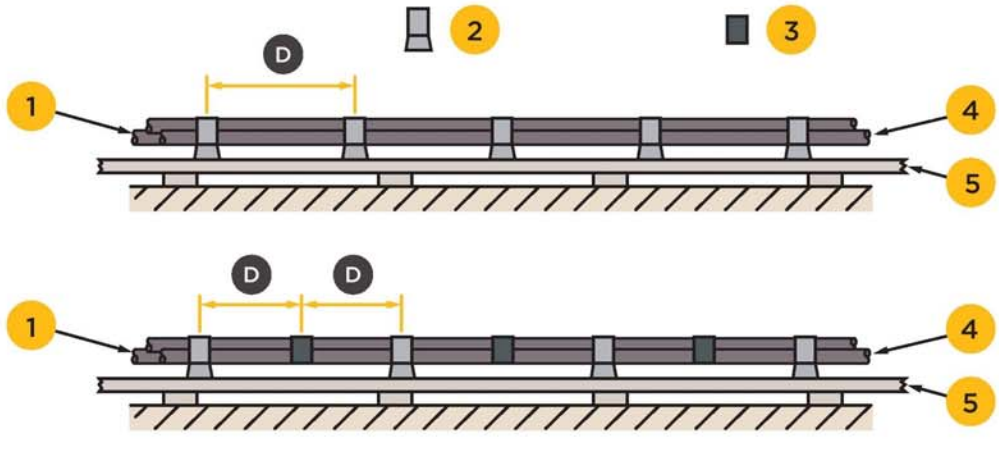
Test for resistance to electromechanical force according to IEC 61914.

A short circuit test is carried out as follows, using the manufacturer's or responsible vendor's declared values of peak short circuit current (i_p) and initial r.m.s symmetrical short circuit current (I"k). Where there are a number of cable cleats in the range, one or more classes are defined (see IEC 61914 - Clause 5.1). This test is performed on the most critical size in each class.

The test is carried out at ambient temperature, considered to be the defined temperature for permanent application, using unarmoured single core 600 V / 1,000 V cable with stranded copper conductor. A test rig is assembled using the selected cables and cable cleats, being the equipment under test, with the equipment and cables used being fully documented. The test is then carried out on the declared arrangement at the declared short circuit level.

Typical test rig layouts are shown in the illustrations below.

TYPICAL LAYOUT FOR TESTING FOR THE RESISTANCE TO ELECTROMECHANICAL FORCES DURING SHORT CIRCUIT:



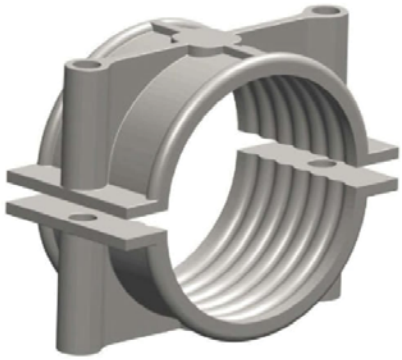
IEC 144/09

KEY

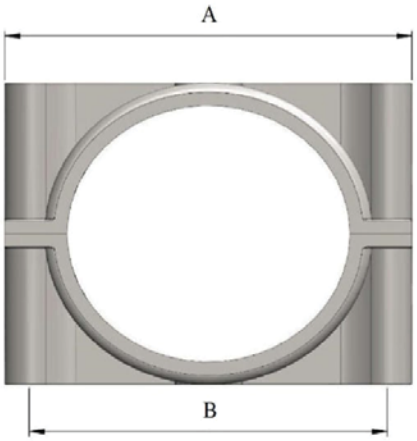
1. Supply end
2. Cable cleats
3. Intermediate restraints
4. Short circuit busbar end
5. Mounting surface

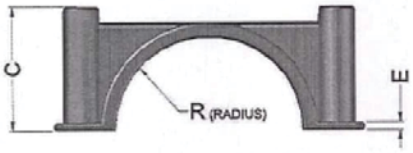
D Spacing

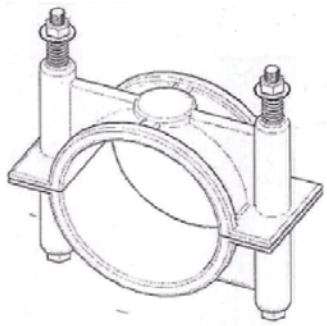
NOVA CABLE CLEATS



- Suitable for use with cable diameters 30 to160mm.
- Manufactured from Aluminium alloy.
- Two-piece, two fixing design.
- Can be double stacked on common fixings.
- Operating temperature -60°C to +105°C.
- Suitable for LV & HV cables upto 132KV.
- Can be used for all types of cable routes.
- Plain finish- for normal industrial areas or indoor application.
- Epoxy coated versions available for harsh environments/outdoor.
- Optional Neoprene liner available.
- In accordance with BS EN 61914:2009
- Short circuit withstand : 110 KA (peak)
- Supplied with SS 316 Fastners.





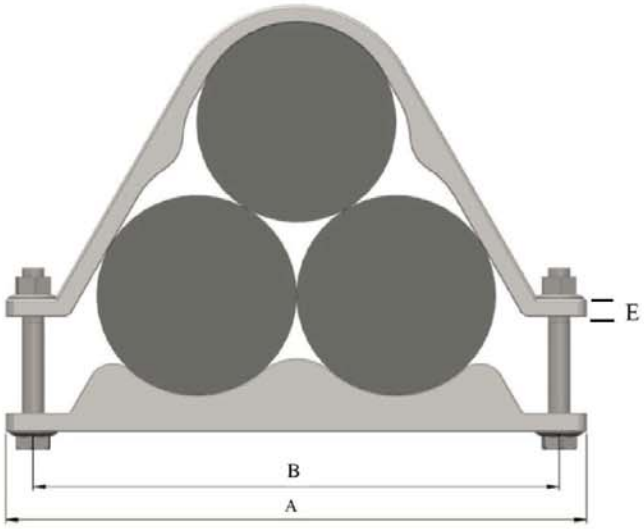


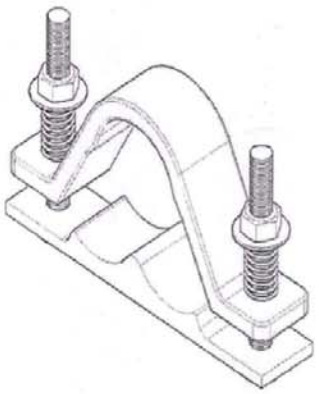
Size	A	B	C	D	E	R	Bolt Size
30 - 40	100	80	25	35	4	20	M8 x 100
40 - 50	110	85	30	45	4	25	M8 x 110
51 - 57	115	85	37	50	4	28	M8 x 120
57 - 64	120	95	37	48	4	32	M8 x 145
64 - 70	122	97	40	48	4	35	M10 x 150
70 - 76	130	101	43	52	4	38	M10 x 150
76 - 83	140	112	46	56	4	41	M10 x 150
83 - 89	150	125	50	60	4	44	M10 x 150
89 - 95	157	130	52	60	4	47	M10 x 150
95 - 101	160	132	55	62	4	50	M10 x 150
101 - 108	165	137	60	65	6	54	M10 x 175
108 - 114	170	143	62	75	6	57	M10 x 175
115 - 125	175	150	63	85	6	62	M10 x 195
125 - 135	193	165	70	84	4	67	M10 x 195
151 - 160	225	195	85	85	6	80	M10 x 225

TREFOIL CABLE CLEAT

NOVA CABLE TREFOIL CLAMPS

- Suitable for use with cable diameters 15 to 152 mm.
- Manufactured from Aluminium alloy.
- Two-piece, two fixing design.
- Operating temperature -60°C to +105°C.
- Suitable for LV & HV cables.
- Can be used for all types of cable routes.
- Plain finish- for normal industrial areas or indoor application.
- Epoxy coated versions available for harsh environments/outdoor.
- Optional Neoprene liner available.
- In accordance with BS EN 61914:2009
- Supplied with SS 316 Fastners.





SIZE	A	B	C	D	E	R	BOLT SIZE
30 - 45	150	120	66	30	8.5	22.5	M10X90
45 - 60	180	145	85	40	8	30	M10X100
60 - 75	225	190	115	40	9	37.5	M10X100
75 - 88	267	235	140	40	10	44	M10X110
87 - 105	345	280	170	50	12	52.5	M10X110
105 - 129	385	350	200	50	12	64.5	M10X110
129 - 152	455	410	250	60	12	76	M10X110

Nova Cable Accessories