

Stainless Steel Cable Cleats



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Stainless Steel Cable Cleats - V-SWORD



Features & Benefits

V-Sword Cable Cleats are designed to fix, retain and support your cables within cable tray system in everyday conditions. More importantly, they help prevent damage in short circuit conditions.

Unfortunately, short circuits do happen, correctly installed cable cleats can restrain the cables within the cable tray, helping avoid cable breaks that can cause damage to the tray systems and injury to your personnel.

V-Sword cable cleats are manufactured in 316L stainless steel materials which have high performance on abrasion, weathering, corrosion and temperature resistance. It is available in multiple sizes with range-taking capability, to suit trefoil or single type cables.

V-Sword cable cleats compact design means that it takes up a minimum amount of space on cable ladder rung or any suitable cable management system, it's quick and easy to install, which can lead to significant savings on installation costs.

Also in order to protect and cushion the cables during short circuit conditions, the cleat is offered with an integral Halogen Free LSF (Low Smoke and Fume) polymeric liner and base pad.

V-Sword cable cleats strictly follow the IEC Standard 61914 (2009) and European Standard EN50368 (2003), passed the short circuit test in the independent lab SINTEF, Norway and STIEE, China, and certified by DNV.

Short Circuits and Short Circuit Testing

Short circuit current is given either as a “peak” or an “rms” value. The peak current is the maximum current experienced by any of the phases and it occurs once within the first few milliseconds of the start of the fault. The rms current is a calculated value for the initial cycles of the fault. The relationship between peak current and rms current varies from installation to installation.

The forces experienced by a cleat during a short circuit are a function of short circuit current, cleat spacing and the distance between the cable centres (in the case of trefoil arrangements this is the cable diameter). The following formula taken from the current standard for cable cleats calculates the force experienced by a cleat with cables arranged in trefoil formation:

Where:

$$F_t = \frac{0.17 \times i_p^2}{S}$$

F_t = Maximum force on the cable connector in trefoil formation for a three phase short-circuit (N/m)

i_p = The peak short-circuit current (kA)

S = The cable diameter (m)

This formula gives the static load instantaneously created by the short circuit, however the phase changes of the alternating current mean that the forces on the cable and their direction are changing continuously. No simple formula and no static test can assess the effect of these dynamic forces. The ultimate proof of any product to withstand a short-circuit is to undertake a short-circuit test.



Cable Cleat Selection and Specification



Step 1. Know Your Cables

- What type of cable is being used? Single or Multi-conductor?
- What is the outside diameter of the cable(s)?
- What is the cable arrangement (single conductor cables only)? Flat or Trefoil?
- If a ground wire will be installed within the cleat, you will need the ground wire outside diameter.

Step 2. Know Your System

- What is the available short circuit current (RMS or I_p (peak))?
- What type of cable tray is installed?

Step 3. Select Your Cable Cleats and Mounting Bracket

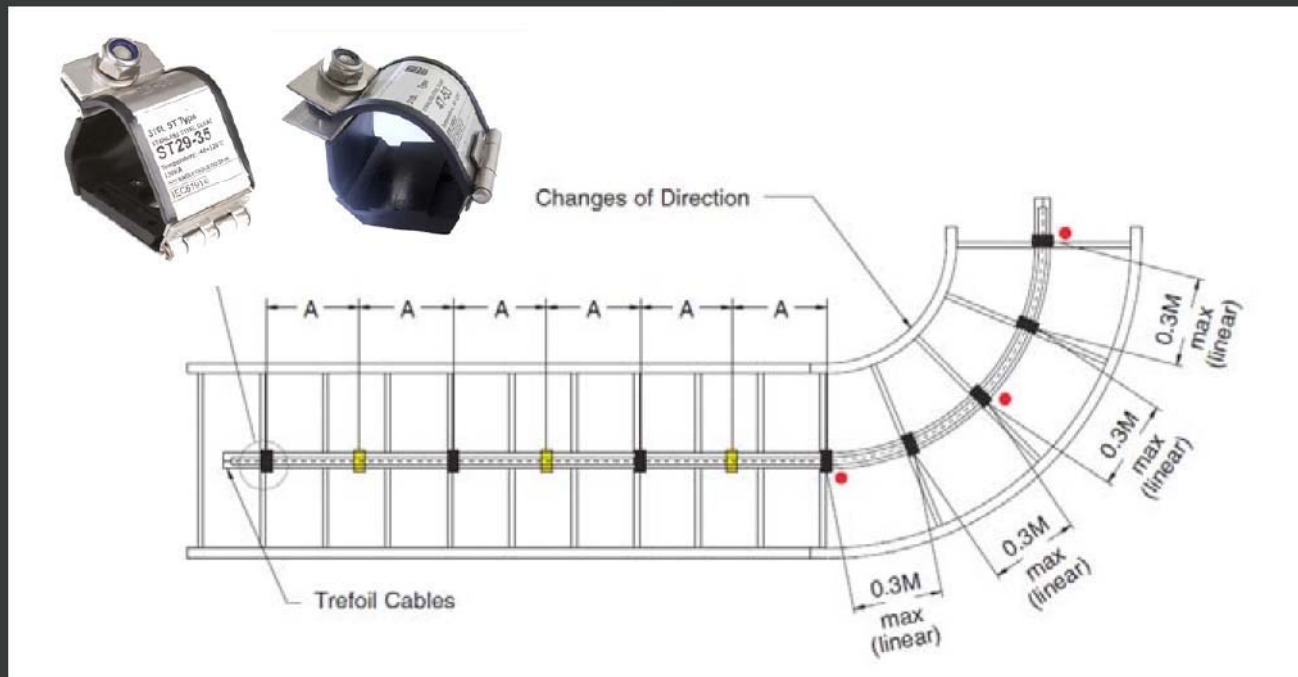
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Step 4. Determine Cleat Spacing for Installation

- Your cable diameter is equal to the spacing between conductor centers shown below.
- Find your cable diameter at the top of the table and look down at the column below it.
- Find the value equal to or greater than the available short circuit for your system.

Single Conductor Short Circuit Withstand Table													
Max. Cable Cleat Spacing (A)		Spacing Between Conductor Centers (mm)											
		23	25	27	29	31	33	35	37	39	41	43	45
mm	In.	I_p peak (KA)											
225	9	179	187	194	203	209	216	220	229	234	240	246	250
300	12	155	163	168	174	181	187	192	198	203	209	214	215
450	18	128	133	137	144	148	152	157	161	165	170	174	178
600	24	110	115	119	124	128	132	135	139	143	148	150	153
675	27	104	108	113	117	121	124	128	132	135	139	143	147
900	36	89	93	97	102	108	108	110	115	117	121	124	127

IMPORTANT: Recommended Installation Procedures:

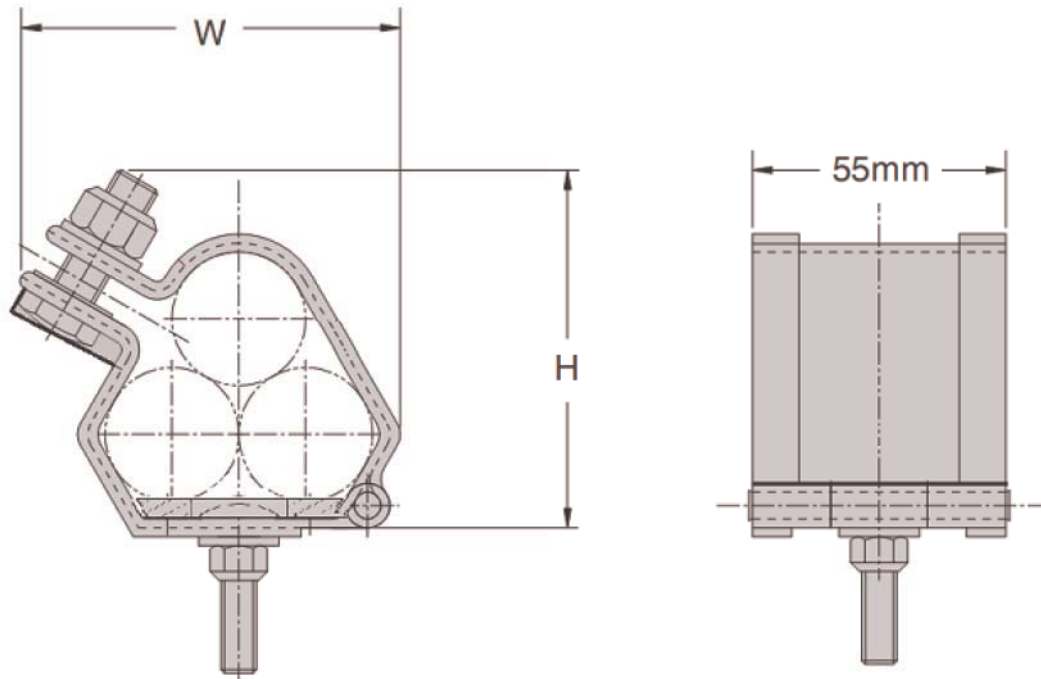


It is important that the cleats are installed properly to secure your cables:

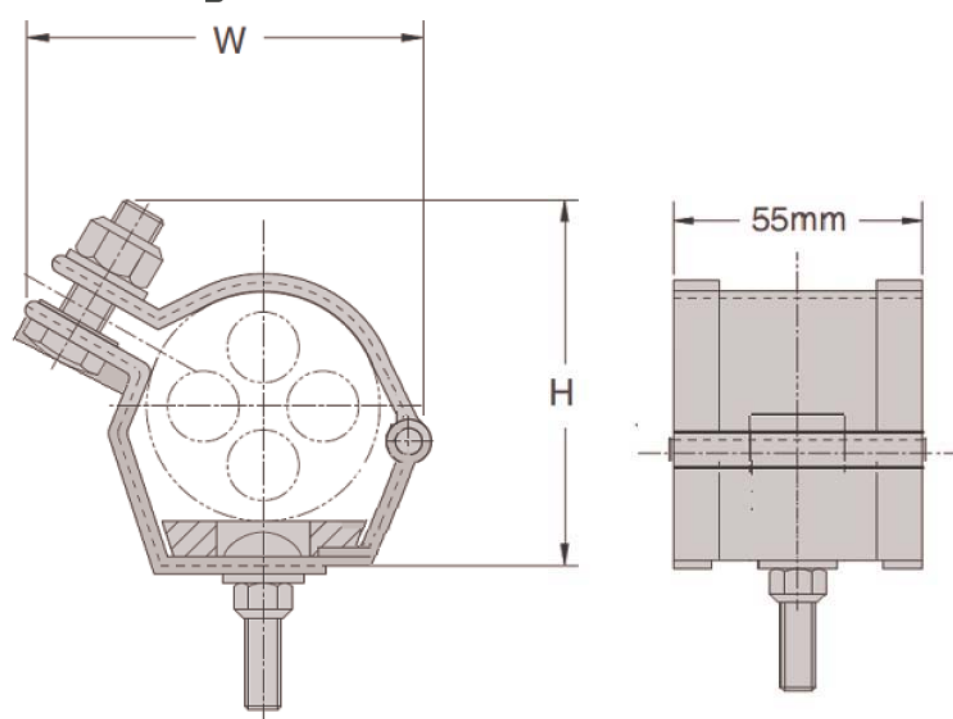
- It is not necessary for every cleat to be attached to the tray. Every other cleat (■) must be attached to the tray system to mount cable in tray. Unattached cleats (■) provide additional restraint to keep cables bundled.
- The bend radius should be 8 to 12 times the cable diameter.
- Cleats should always be installed at the beginning, middle and end of a bend (●), and at no time should the distance between cleats on a bend be more than 0.3M center to center.



V-Sword Trefoil Cleat



V-Sword Single Cleat



Classification		Technical Specifications	
Cleat Type	Composite	Frame	55mm*1.5mm, Marine Grade, Non-Magnetic 316L
Resistance to Electromechanical Force	135KA/55KA RMS ,60mm Spacing	Closure Hardware	Captive 316SS M8 or M10 bolt and nylon-lock nut (Optional Hex Flange Lock Nut Available)
Lateral Load Test	20Kg Average	Integral Pad	Low Smoke, Low Fume, Halogen Free
Axial Load Test	Pass	Tools Required	Impact Wrench
Operating Temperature Range	-40°C-105°C	Mounting Bolt	Provided with cable cleat
Impact Resistance	Very Heavy		
Needle Flame Test	30 Seconds		

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V-Sword Trefoil Cleat



Series	Part Number	Suitable Cable Dia (mm)	Dimension (mm)	
			H	W
VST	1323	13~23	74	66
	1925	19~25	77	70
	2329	23~29	81	78
	2531	25~31	84	81
	2733	27~33	86	83
	2935	29~35	90	89
	3238	32~38	94	95
	3541	35~41.5	98	100
	3844	38~44.5	101	104
	4248	42~48	105	111
	4551	45~51	109	117
	4753	47~53	111	120
	4955	49~55	114	124
	5157	51~57	116	127
	5359	53~59	119	133
	5561	55~61	124	137
	5763	57~63	126	140
	5965	59~65	128	144
	6167	61~67	132	147
	6369	63~69	136	150
	6571	65~71	140	153
	6773	67~73	143	156
	6975	69~75	147	160
	7177	71~77	151	163
	7379	73~79	154	166
	7581	75~81	158	169
	7783	77~83	161	173
	7985	79~85	164	176
	8187	81~87	169	179
	8389	83~89	173	182
	8692	86~92	177	187
	8896	88~96	181	192
	9199	91~99	185	196
	96103	96~103	190	201
	99107	99~107	194	202
	103111	103~111	199	204
	107115	107~115	203	208
	111119	111~119	208	213
	115123	115~123	213	217
	119128	119~128	217	221

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Series	Part Number	Suitable Cable Dia (mm)	Dimension (mm)	
		(mm)	H	W

VSG	2832	28~32	61	55
	3034	30~34	63	57
	3236	32~36	65	59
	3438	34~38	67	61
	3640	36~40	71	63
	3842	38~42	69	65
	4044	40~44	71	67
	4246	42~46	72	69
	4448	44~48	74	71
	4650	46~50	75	73
	4852	48~52	77	75
	5054	50~54	79	77
	5256	52~56	80	79
	5458	54~58	81	81
	5660	56~60	83	83
	5862	58~62	85	85
	6064	60~64	86	87
	6266	62~66	88	89
	6468	64~68	90	91
	6670	66~70	91	93
	6872	68~72	93	95
	7074	70~74	95	97
	7276	72~76	97	99
	7478	74~78	99	101
	7680	76~80	101	103
	7882	78~82	103	105
	8084	80~84	105	107
	8286	82~86	107	109
	8488	84~88	109	111
	8690	86~90	110	113
	8892	88~92	113	117
	9094	90~94	116	120
	9296	92~96	126	127
	94106	94~106	135	133
	100112	100~112	140	139
	106118	106~118	145	145
	112124	112~124	153	155
	118130	118~130	162	165
	127139	127~139	161	167
	132144	132~144	165	173
	138150	138~150	170	179