

PROTECTION OF PV SYSTEMS



Photovoltaic Array Overcurrent Protection

NH gPV fuse selection

Define panel data:

- $I_{SC_MOD_STC}$
- $I_{MOD_MAX_OCPR}$
- U_{OC_STC}
- number of panels
- number of strings



PV Array overcurrent protection



Apply NH PV fuse to + and - pole of string

PV array overcurrent protection:

$$I_n > 1,25 \times I_{SC_ARRAY} \text{ - the short circuit current of the PV array at STC}$$

$$I_n \leq 2,4 \times I_{SC_ARRAY}$$

$$I_{SC_ARRAY} = I_{SC_MOD_STC} \times \text{No. of PV strings}$$

ETI as one of the most important European producer of overcurrent protection equipment and devices participating in many working groups for standards development at International Electrotechnical Commission (IEC). ETI is member of maintenance team MT9 belonging to the 32B group, working on the part 6 of the IEC 60269-7 dealing with supplementary requirements for fuse-links for the overcurrent protection of solar photovoltaic energy systems.

gPV fuse-link must be selected acc. standard IEC 62548

NH gPV 1000V - Fuse-links

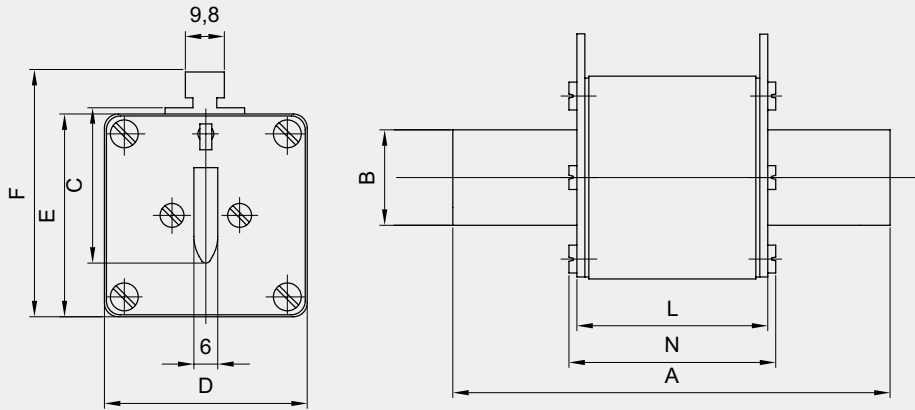
General characteristics	
Rated voltage	1000V d.c. (NH1, 2, 3: L/R=1ms; NH0, 1C: L/R=2ms)
Breaking capacity	30kA d.c. (NH1, 2, 3), 20kA d.c. (NH0, 1C)
Standards	IEC 60269-6
Application	Fuse-link for DC application. Applied in fuse base PK1, 2, 3 1000V d.c..



NH gPV 1000V d.c.														
Size	I_n [A]	gPV Standard indicator Code No. Pic.1	gPV S_{110} screw contact Code No. Pic.2	gPV U_{110} screw contact Code No. Pic.3	gPV G screw contact with centre trip indicator for microswitch MK Code No. Pic.4	Power dissipation ($0,7 \times I_n$) [W]	Power dissipation [W]	Pre-arcing Joule integral [I ² t] (L/R = 1ms)	Operating Joule integral [I ² t] (L/R = 1ms)	Weight [g]	Packaging [pcs]			
0	32	004110381	-	-	-	7,6	7,6	52	430	280	3/45			
	40	004110383	-	-	-	8,8	8,8	96	730					
	50	004110384	-	-	-	11,0	11,0	155	920					
	63	004110385	-	-	-	13,5	13,5	290	1.760					
	80	004110386	-	-	-	17,0	17,0	520	3.160					
	100	004110387	-	-	-	21,0	21,0	1.110	5.280					
	125	004110388	-	-	-	22	22	2.800	11.340					
1C	160	004110389	-	-	-	32	32	5.950	20.750	300	3/45			
	32	004110371	-	-	-	7,6	7,6	52	430					
	40	004110373	-	-	-	8,8	8,8	96	730					
	50	004110374	-	-	-	11,0	11,0	155	920					
	63	004110375	-	-	-	13,5	13,5	290	1.760					
	80	004110376	-	-	-	17,0	17,0	520	3.160					
	100	004110377	-	-	-	21,0	21,0	1.110	5.280					
1	125	004110378	-	-	-	22	22	2.800	11.340	500	3/24			
	160	004110379	-	-	-	32	32	5.950	20.750					
	200	004110342	-	-	-	11	27	4.400	29.000					
	2	200	004110343	004110292	004110296	004110346	11	26	4.400			29.000	650	1/16 (G screw contact: 2/16)
		250	004110344	004110293	004110297	004110347	15	36	6.000			38.000		
	3	160	004110456	-	-	-	15	38	5.000			10.000	1200	3/15 (G screw contact: 2/8)
		200	004110455	-	-	-	18	45	10.000			20.000		
250		004110458	-	-	-	18	44	20.000	40.000					
315		004110460	004110294	004110298	004110232	24	54	40.000	80.000					
350		004110459	004110348	004110349	004110233	25	55	45.000	90.000					
400		004110457	004110295	004110299	004110234	24	58	46.000	138.000					



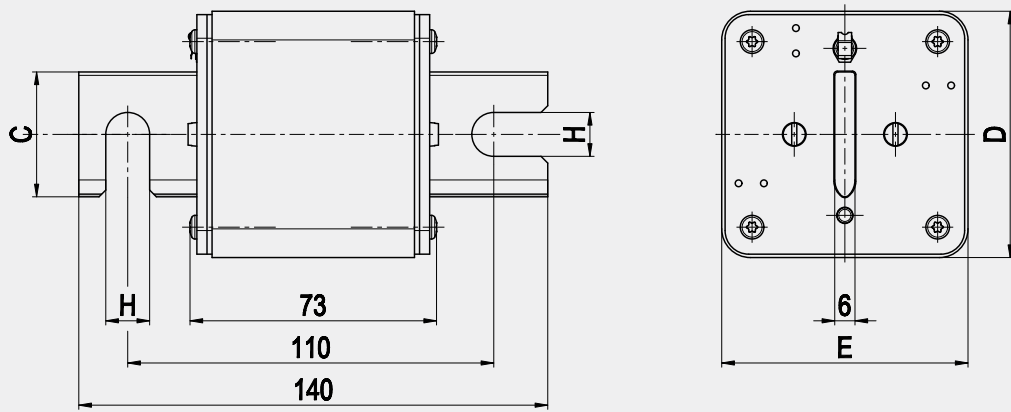
Pic.1



Standard indicator

Size	A	B	C	D	E	F	L	N
1	135	24	42	51	51	67	70	74
2	150	30	48	61	61	71	70	74
3	150	37	60	73	73	87	70	74

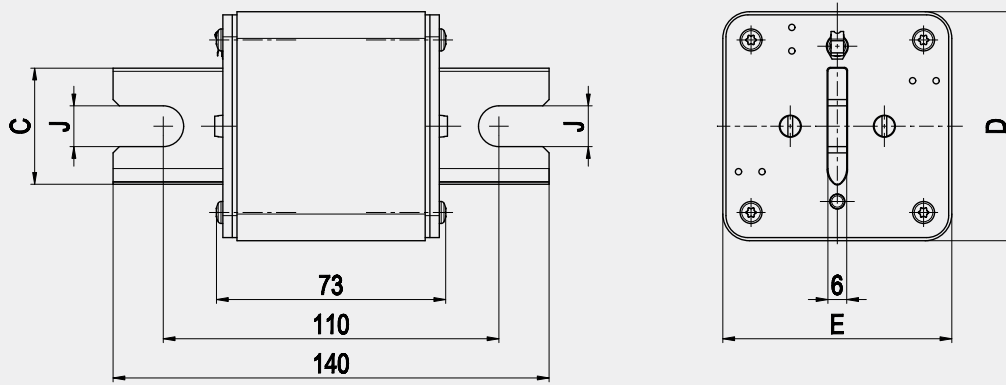
Pic.2



S₁₁₀ screw contact

Size	C	E	D	H
2	30	60	60	11
3	37	73	73	11

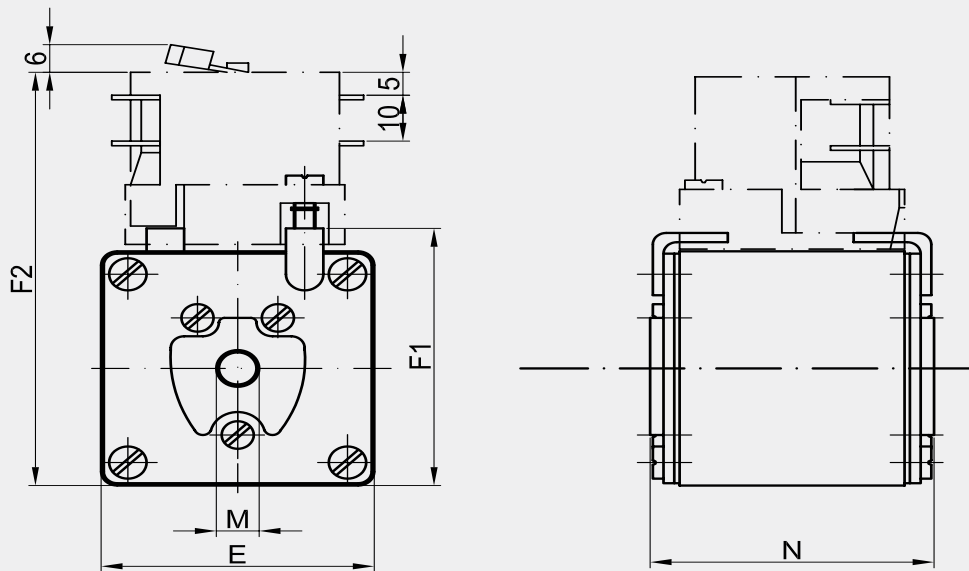
Pic.3



U₁₁₀ screw contact

Size	C	J	E	D
2	30	13	60	60
3	37	13	73	73

Pic.4



G screw contact

Size	D	E	F1	F2	M	N
2	60	60	65	99	M10	75
3	75	75	80	114	M12	75