

# Short-Circuit

**Electromagnetic Forces (Ipk)** are induced in conductors by the currents flowing through them. When parallel conductors are longer compared to the distance between them, the force will be evenly distributed along the conductors. The force is attractive when the currents in the two conductors have the same direction resulting in a “pull” mechanical effect. When the directions of the currents are opposite, the forces are repulsive resulting into a “push” mechanical effect.

A **Thermal Phenomenon (Icw)** is created by the ampacity carried in the conductive parts. The increase of conductor temperature is linked to the resistance of the conductor material and cross section, ampacity and duration.

This phenomenon may destroy the device or the conductor insulation if the selection is not properly done. The device or conductor characteristics are quantified by a maximum admissible ampacity (Icw).



Before Short-circuit test



After Short-circuit test

Insulated Braided conductor type	IBSB ADV 25 IBS ADV 25	IBSB ADV 50 IBS ADV 50	IBSB ADV 70	IBSB ADV 100	IBSB ADV 120	IBSB ADV 185	IBSB ADV 240
Cross Section mm <sup>2</sup>	25	50	70	100	120	185	240
<b>Short-Circuit withstand Strength (Ipk)</b>							
Design Upstream protection Device Cut off current limited peak	25	70	70	70	70	70	105
Energy dissipation Joule integrale, I <sup>2</sup> t [A <sup>2</sup> s]	2.28E+07	8.17E+07	1.00E+08	3.30E+08	3.30E+08	8.78E+08	1.52E+09
<b>Thermal short-circuit strength (Icw)</b>							
kA (0,2 second)	10.7	20.2	22.4	40.6	40.6	66.3	87.2
kA (0,5 second)	6.7	12.8	14.1	25.7	25.7	41.9	55.2

The conductors on the supply side (upstream) of the functional unit can be rated based on the load side (downstream) from a short-circuit perspective (IEC 61431.1-§8.6.1) with no specific requirement for IBS/ IBSB Advanced (see page 17 class II).

