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How-to: Calculating the Segregation of Power and Data Cables

A = S x P (mm)

- A — Calculated minimum segregation of data and power cables
- S — Minimum distance according to table 1
- P — Power cabling coefficient according to table 2

Table 1 from EN 50174-2, part 6.2.1, tab. 8

Segregation type	Cable type	No metal barrier (v mm)	Mesh tray (v mm)	Perforated metal tray (v mm)	Full metal tray (v mm)
a	Cables for radio and TV transmission	300	225	150	0
b	U/UTP data cables	100	75	50	0
c	F/UTP, U/FTP, F/FTP, S/FTP data cables	50	38	25	0
d	S/FTP data cables	10	8	5	0

Table 2 from EN 50174-2, part 6.2.1 , tab. 9

No. of power circuits	Coefficient P
1 to 3	0,2
4 to 6	0,4
7 to 9	0,6
10 to 12	0,8
13 to 15	1
16 to 30	2
31 to 45	3
46 to 60	4
61 to 75	5
More than 75	6

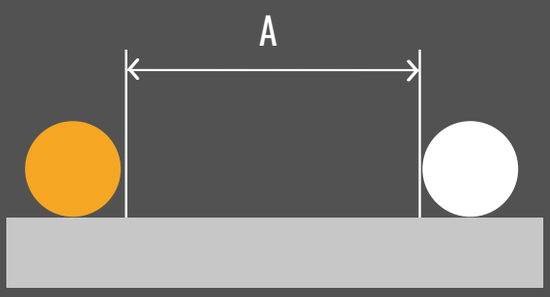
Legend to table 1 - trays

- Wire tray = mesh size up to 50 x 100 mm or perforated steel tray with more than 20% perforation or metal thickness less than 1 mm
- Perforated tray = max. 20% perforation, metal thickness min. 1 mm, otherwise as for wire tray
- Solid tray/steel pipe = metal thicknes min. 1.5 mm, otherwise as perforated tray
- The tray is always filled max. 10 mm below the upper edge, it is always assumed that the tray is made of magnetically conductive material (not aluminum or stainless steel)

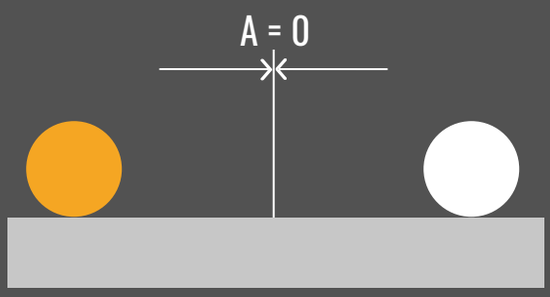
Legend to Table 2 - Power Circuits

- Power circuit = 230V, single phase, max. 20A
- Three phases = 3 circuits
- Each multiple of 20A is another circuit
- Applies to different voltages, always calculates with the current value
- E.g. a three-phase 60A circuit is 3 x 3 = 9 circuits (even at 24V)
- For more information, see EN 50174-2, part 6.2.1

SEGREGATION WITHOUT DIVIDING BARRIER

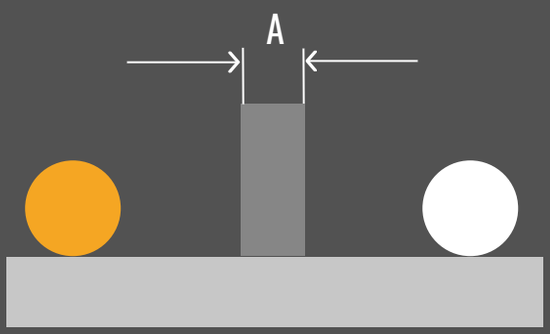


Fixed cable bundles - i.e. the location of the bundles in the route cannot be changed during the use of the cabling, A = distance between fixed bundles

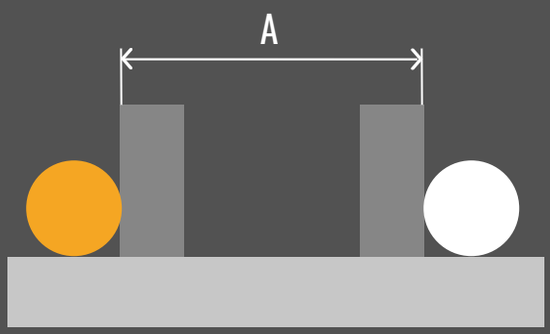


For bundles without fixing or any barrier, A is always considered to be 0 mm - i.e. there is no clearance, the location of the cable bundles may change during the use of the cabling (undesired)

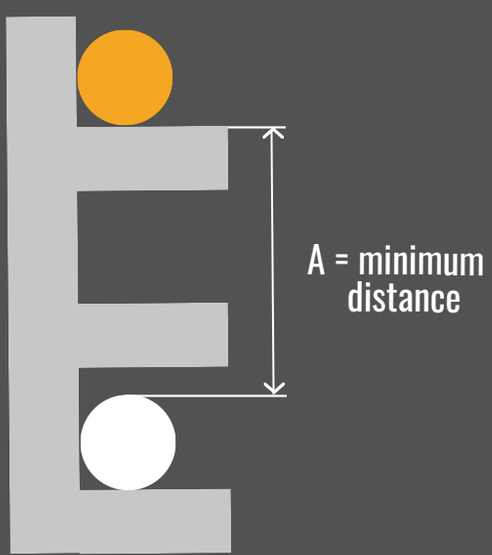
SEGREGATION WITH DIVIDING BARRIER

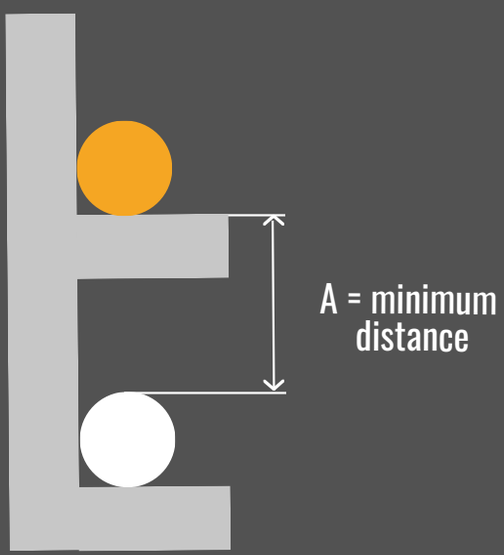


If the cables are not firmly attached, then the assumed distance A = the width of the dividing barrier, here too A must always correspond to the calculation above



In the case of non-adjacent route sections, A = distance between dividing barriers





Data cables Power cables

Source: EN 50174-2, part 6.2.1

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OTHER IMPORTANT REQUIREMENTS FROM EN 50174-2

- Crossing of data and power cables must be at an angle of 90°. The requirement for minimum cable distance A must also be met.
- Power and data cables must not be routed together in one cable bundle or in the same section of the cable route or support system, unless physical and fixed segregation is maintained according to the requirements above.
- In front of the firestop penetration, the spacing A can be reduced for unprotected routes, the reduction can be a max. 0.5 m in front of and behind the firestop seal (does not apply to cables with a voltage higher than 600 V AC). However, the requirements for separate routing of individual cable types must be met.
- Data and power racks should always be separated.
- Shielded cabling with continuous connection of the shielding of all elements (i.e. installation cable and components on both sides of the cable) must always be properly grounded according to EN 50174-2. The grounding and bonding of the cabling must be in accordance with EN 50310.

SEGREGARTION OF DATA CABLES FROM SPECIFIC SOURCES OF INTERFERENCE

SOURCE OF INTERFERENCE	MINIMUM SEGREGATION
Fluorescent lights	130 mm
Neons	130 mm
Mercury discharge lamps	130 mm
Headlight bulbs	130 mm
Arc welders	800 mm
Frequency induction heating	1 000 mm

Source: EN 50174-2, part 6.2.1, table 10

CONDITIONAL MITIGATION OF MIN. SEGREGATION REQUIREMENT

Under certain conditions, it is possible to relax the requirements for the distance between data and power cables (i.e. there is no need to comply with the calculated minimum distance A):

- These are not special cases from the previous table (i.e. EN 50174-2, part 6.2.1, table 10)
- The cables comply with the segregation class b, c, or d (i.e. all Solarix cables, see datasheets)
- The high-current cables are in a total sheath with a total current of up to 100 A, or these cables are twisted, taped or bundled together with a total current of up to 32 A
- Individual cable types are routed in separate bundles
- The premises do not serve as a server room (or a distribution node)
- The environment complies with MICE classification E1 according to EN 50173 - i.e. there are no voltage transients in the space and the magnetic field intensity is max. 1 A/m (see examples below, but it is always necessary to assess this individually)
- For more information on mitigating the minimum distance requirement, see EN 50174-2, parts 6.2.2 and 6.3.

EXAMPLES OF TYPICAL E1 ENVIRONMENTS WITH MAGNETIC FIELD INTENSITY UP TO 1 A/m

E1

E1 – low electromagnetic interference (normal environment)

Environments with minimal or low electromagnetic interference, where household and office electrical appliances are common.

- Single-family and apartment buildings
- Office buildings
- Shopping malls
- Schools and universities
- Hotels, etc.



If you have any packaging or parts of packaging left over after installing Solarix products, be sure to dispose of them properly.

DO YOU NEED ADVICE?

If you need advice on installing Solarix products, please contact us at info@solarix.cz or by phone at +420 840 505 555.

Note: more information on the correct connection of shielded cabling and all related installation procedures can be found in the EN 50174 standard set. We recommend purchasing these documents and following them. They contain a lot of useful and practical information.

IMPORTANT: The content of this document is updated regularly. Therefore, always use the latest version downloaded from our website.