

# Using R88A-CA1G power cables

## Technical Note

### **BACKGROUND**

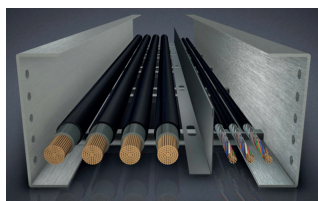
The R88A-CA1GxxxSF (without brake), R88A-CA1GxxxBF (with brake) and R88A-CA1GExxBF (extension) power cables are intended to be used with the following 1S servo motors:

- R88M-1L(4K0/5K0)30C-xS2
- R88M-1M(4K0/5K5)15C-xS2

The wire section has been optimized for the motor and the combination is suitable even in the limit conditions of ambient temperature and current.

The power cable increases its temperature due to Joule's effect and, in normal conditions, the heat produced is dissipated by natural convection, so the cable temperature remains below its maximum temperature (115°C).

However, when you use several motors in the same installation and their power cables travel together through the same duct, heat dissipation by natural convection is reduced due to mutual influence and the cable might exceed its maximum temperature.



In the next section you will find the guidelines to evaluate if the cable temperature reaches acceptable values in your current installation, depending on the motor model, the quantity of motors and the duct layout.

### **CASE EVALUATION**

Below you will find 3 cases. The conditions for the case evaluation are as follows:

- All motors are of the same size
- All motors work at 100% load (working at rated motor torque in average)
- Ambient temperature is the maximum specified

**Case 1:** Installation with several R88M-1L4K030C or R88M-1M4K015C motors

Arrangement	Number of motor power cables in the same duct						
	1	2	3	4	6	8	
S=d	OK	OK	NG	NG	NG	NG	
S=2d	---	OK	OK	OK	OK	OK	
S=3d	---	OK	OK	OK	OK	OK	

d = Cable diameter

S = Separation from center of cables

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### Case 2: Installation with several R88M-1L5K030C motors

Arrangement	Number of motor power cables in the same duct						
	1	2	3	4	6	8	
Arrangement							
S=d	OK	OK	NG	NG	NG	NG	
S=2d	---	OK	OK	OK	OK	OK	
S=3d	---	OK	OK	OK	OK	OK	

d = Cable diameter

S = Separation from center of cables

### Case 3: Installation with several R88M-1M5K515C motors

Arrangement	Number of motor power cables in the same duct						
	1	2	3	4	6	8	
Arrangement							
S=d	OK	OK	NG	NG	NG	NG	
S=2d	---	OK	OK	NG	NG	NG	
S=3d	---	OK	OK	OK	OK	NG	

d = Cable diameter

S = Separation from center of cables

If your arrangement results in NG, the power cable might reach excessive temperatures. The alternatives to build a proper installation are as follows:

- Split the power cables in 2 or more ducts
- Use a bigger duct where you can guarantee a bigger cable separation (increasing 'S' factor)
- Use the R88A-CA1H power cable instead of R88A-CA1G. It has a bigger section, so it produces less heat. With this cable there are no limitations in the duct configuration

In case you have a doubt or a different configuration, please contact your Omron representative.