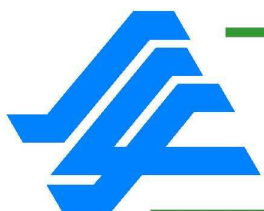




# Line-side Products



**SCS Static Control Systems**  
Electronic Drives and Automation



## The Company

SCS Static Control Systems has been successfully operating in the industrial automation field since 1977. In the beginning, the company designed and manufactured static electrical controls for automated machines and systems and, starting in 1978, it began designing and manufacturing analog converters for DC-powered motors. Thanks to its technical expertise, in 1986 SCS was chosen by Mitsubishi Electric as the sole distributor for Italy. In 1994, the company began manufacturing analog drives for trapezoidal brushless motors and in 1997, it designed and manufactured the first family of digital drives for sinusoidal brushless motors. In just a few years, the sinusoidal vector converter became the company's leading product and in 2005, a new generation of brushless motor drives was launched to upgrade the control section of the motor. The recent release of third-generation brushless servo drives crowns the 10 years evolution of the product line.

SCS operates in Italy and abroad currently offering a wide services portfolio. From analog and digital systems design, based on the expertise of its R&D department, to system integration design and deliver, based on the experience and know-how of its Engineering Department. The corporate mission is focused on quality, flexibility and the ability to assist the customer through all phases of machine realisation. After-sales service and technical support have also always been a significant part of corporate policy and have become well-known and appreciated by all operators in the industry.

## The Research & Development Dept.

SCS' pride is its R&D team, which designs innovative solutions to support the most demanding performance requirements of the market. The company provides consulting and engineering services while continuously ensuring a complete product customization. Qualified engineers always up-to-date to the latest technologies concerning development platforms, design the hardware and software for our products while focusing on innovation and reliability. Digital solutions have been studied to facilitate the task of machine design engineers and the most advanced tools have been used to simulate, debug and test new-generation DSP and FPGA platforms. The daily exchange of information between the Technical Support and R&D department leads to continuous product evolution, which not only allows the customer to make the most suitable technical choices, but also guides our company to identify specifications for new product generations.

## The Engineering Dept.

The significant experience gained by designing systems based on all state-of-the-art products on the market, has allowed SCS' Engineering Department to ensure maximum reliability and expertise. Specifically, SCS is a SIEMENS Certified System Integrator, thanks to 30 years of experience using specific products for the industrial automation industry. Our Engineering Department's hardware and software design engineers look for increasingly innovative solutions to simplify the commissioning and the maintenance of the systems and to achieve increasingly high performance. Our technicians' significant design experience allows them to manage commissioning and start-up phases in a timely and safe manner.

## The production

Every internal phase including production, assembly and testing is performed by qualified personnel under the supervision of highly experienced managers. Thanks to close collaboration and co-design with our suppliers, the quality of our components is also constantly under control, thus guaranteeing maximum product reliability. In fact, SCS products undergo rigorous static and functional testing procedures, both for the Systems Division as well as for the Drives Division. Our personnel is continuously trained and this contributes to spread inside the company the mission concepts such as quality assurance, proactive testing and specific expertise regarding all production process phases. The R&D department provides technicians and testing operators, support regarding all requests for personalisation or to successfully pass the commissioning phase. These are just a few reasons why SCS is truly an ideal partner when it comes to positive, long-lasting collaboration based on significant technological value.

SCS has made its name in the sector over the years thanks to the excellent quality of its staff. Our staff has played an important role in this growth through constant updates and professional improvements in order to respond to increasingly strict quality standards, thereby making a vital contribution to the success of the company.





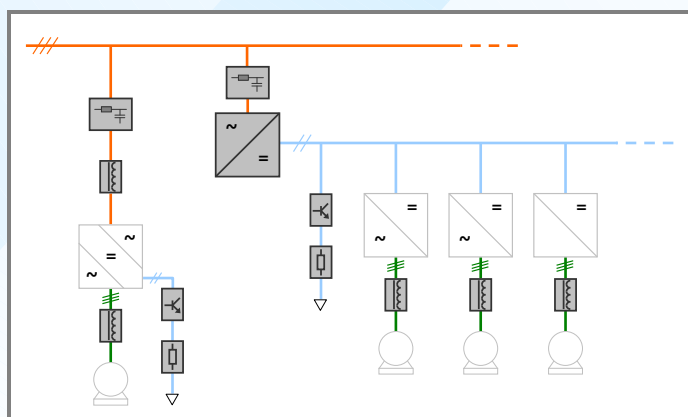


# INTRO

**LINE-SIDE PRODUCTS** family offers to our customers a wide range of devices that can directly connect to the power supply line or have to do with DC-BUS connection.

**SCS** designs and produces DC-BUS power supply units and braking units to be used in big scale applications.

**SCS** also offers certified EMC filters, line-side and motor-side inductances and braking resistors.



If you need to ***fill the line***, **SCS** is the right partner for you.



# SUMMARY

## DCB

3 PHASE HALF CONTROLLED LINE MODULE FOR DC-BUS APPLICATION

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BRAKING UNIT FOR FREQUENCY INVERTERS AND CONVERTERS

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# DCB

## 3 PHASE HALF CONTROLLED LINE MODULE FOR DC-BUS APPLICATION

### GENERAL DESCRIPTION

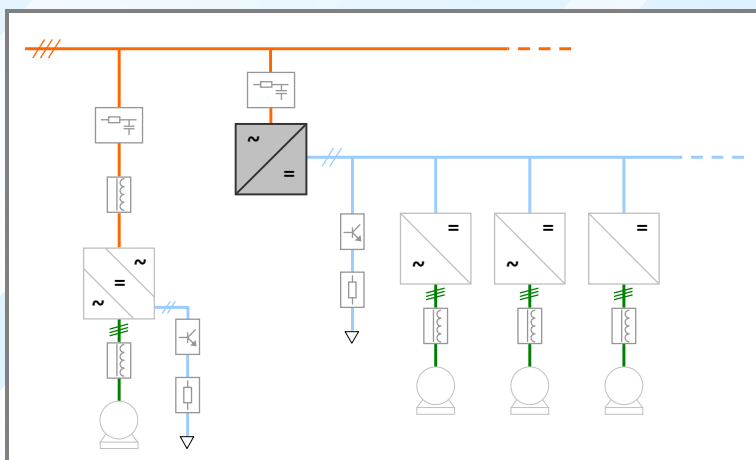
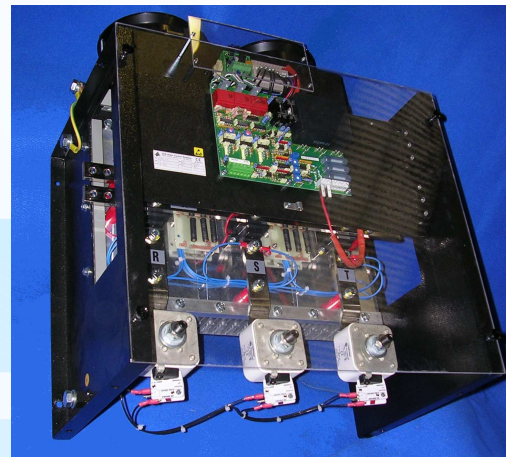
The DCB40-XXXX line modules are designed for multi-axes drive systems and provide a DC supply to mean and large power inverter.  
The DCB40-XXX modules prevent high inrush current charging up the capacitor battery of the inverter gently ramping-up the DC voltage.  
The three-phase half controlled SCR based power section covers a wide current and main voltage range.

### MAIN FEATURES

Wide current product range  
Single regulation board over the whole portfolio increase modularity and spare parts replacement

### OTHER FEATURES

Power supply up to 500Vac  
ON board regulation and power fuses  
External contact ramp enable  
Internal or external reference switch  
Terminal board relay contacts for alarms  
Digital inputs and outputs protection  
Safe SCR turn on technology



### ORDERING DATA

#### DCB 40-450

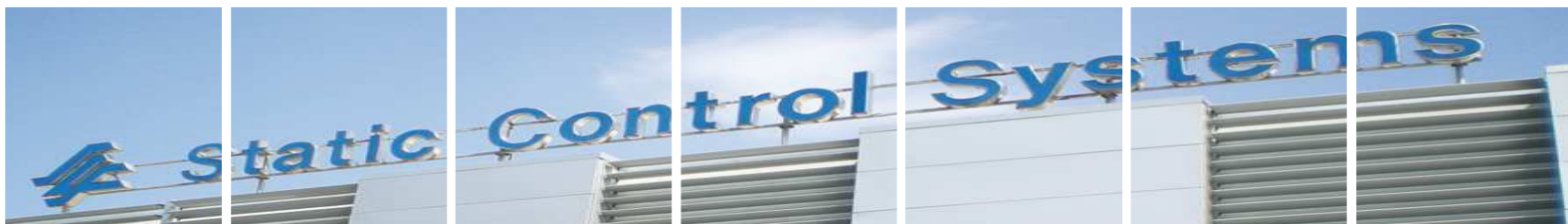
Rated current (from 130A to 2400A)

Main power supply (from 200V to 500V)

- 40... up to 415V a 200V
- 44... up to da 460V
- 48... up to da 500V

DC-BUS 3-phase converter





## APPLICATION TABLE / PRODUCT SELECTION

	(1)	(2)	(3)	Dimensions		
Converter	In	Ith	Ip	L	H	P
	A	A	A	mm	mm	mm
DCB <b>XX</b> -130	130	145	160	190	270	345
DCB <b>XX</b> -165	165	185	200	190	270	345
DCB <b>XX</b> -250	250	280	310	190	270	345
DCB <b>XX</b> -450	450	500	550	500	531	320
DCB <b>XX</b> -575	575	650	720	500	631	320
DCB <b>XX</b> -800	800	900	1000	500	631	320
DCB <b>XX</b> -1100	1100	1200	1350	500	640	335
DCB <b>XX</b> -1300	1300	1450	1600	500	820	335
DCB <b>XX</b> -1550	1550	1800	1900	500	820	335
DCB <b>XX</b> -1800	1800	2000	2200	620	764	402
DCB <b>XX</b> -2400	2400	2700	3000	620	775	432

### XX :

- 40 for power supply up to 380V +20% : standard version
- 44 for power supply up to 440V +20% : upon request
- 48 for power supply up to 480V +20% : upon request

- 1) Nominal DC-BUS current for S1 service. (overload permitted) (CEI EN60146)
- 2) Thermal current for S1 service (overload not permitted) (CEI EN60146)- class I
- 3) Overload current; overload time: 30 sec. max – d.c = 1/20.

## TECHNICAL SPECIFICATIONS

- ◆ Power supply and working cycle in accordance with CEI EN60146 (IEC146) - par. 131 EN61800.1
- ◆ Control board standard power supply 3x220V, 380V, 440V, 480V  $\pm 20\%$  with internal voltage selection. 200V  $\pm 10\%$ , 235V  $\pm 10\%$ , 415V  $\pm 10\%$ , 420V  $\pm 15\%$ , 460V  $\pm 15\%$ , 500V  $\pm 10\%$ .
- ◆ Control board voltage limits :
  - 220V : da 176V a 264V
  - 380V: da 304V a 456V
  - 440V: da 352V a 528V
  - 480V: da 384V a 576V
- ◆ Power supply derived from power section (3x400V) +15% max.
- ◆ Maximum voltage 3x500V  $\pm 10\%$  (a richiesta, per DCB44...DCB48....).
- ◆ Frequency: 50Hz  $\pm 4\%$  or 60Hz  $\pm 4\%$  (selection via CV3).
- ◆ Forced air cooling through built-in fan: single phase 220V .
- ◆ Permissible air temperature: 0° to 40°C at nominal current; up to 65°C with 1,25% derating per grade.
- ◆ Normal Industrial ambient normale, see IEC 146 par.134/135, IEC 68 EN61800.1.
- ◆ Protection degree: IP00 according to IEC 144 - DIN40050.
- ◆ Isolation: in accordance with IEC 326 EN60664- VDE0110 GRC/B.
- ◆ 3 thyristors + 3 diodes bridge ( 3phase ahlf controlled Graetz B6HK) . Six pulses per cycle at amximum voltage.
- ◆ One quadrant open and closed loop (voltage).
- ◆ Positive logic inputs: (standard +24V +20% 5mA)
- ◆ Relay outputs : 5A/250V
- ◆ Standard auxiliary circuits:
  - Turn-on ramp: 2+20 sec.
  - Voltage loop control (no current loop)





# UFS

## BRAKING UNITS

### GENERAL DESCRIPTION

The UFS braking units are designed to be used with any frequency inverter or converter equipped with BUS-DC. These units can dissipate, through a static chopper, the energy coming from the load during the braking phase. The product family has UL Certification for NAFTA market use.

### MAIN FEATURES

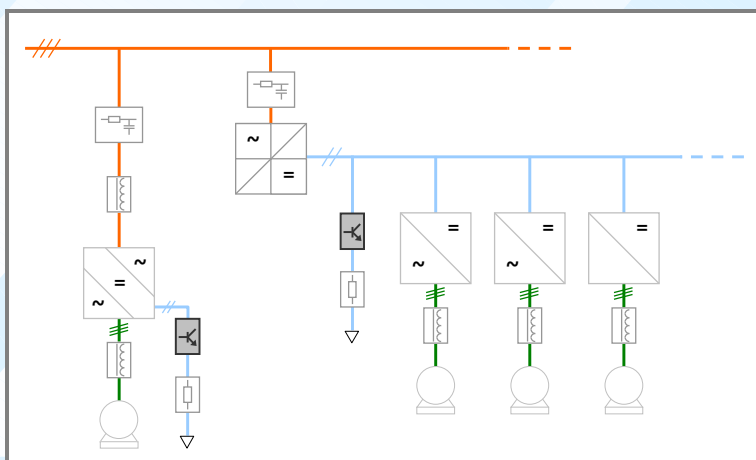
- User selectable braking threshold
- Self powered from DC-BUS
- Master-Slave functionality
- Internal electro-mechanical thermal relay with insulated auxiliary contacts for braking resistor protection.
- Starndar kits of braking resistors

### ORDERING DATA

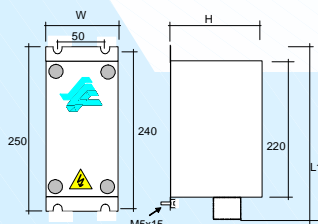
UFS 22 J

Voltage size:  
- J : 230V  
- nothing : 400V

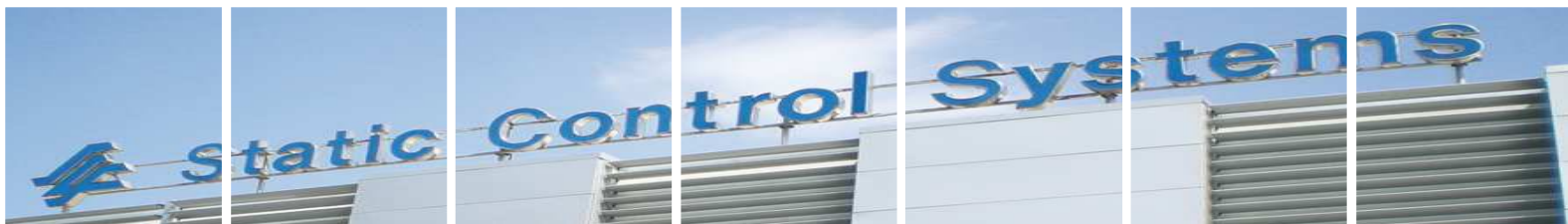
Rated current



### OUTLINE DIMENSIONS



Model	Quote			Weight
	W	L1	H	
UFS15,22,40 UFS15J,22J,40J	100	/	175	2.5 Kg
UFS110	107	270	195	3.9 Kg



## APPLICATION TABLE / PRODUCT SELECTION

Unit	Braking voltage Standard <b>(SW1-4 = ON)</b>	Maximum peak current IP (A)	Maximum instantaneous power Pmax (KW)	Standard Ith (A)	%ED Max	RF(Ω) min.
UFS15	745	18	14	4+6	10%	>40
UFS22	745	34	25	7+11	10%	>22
UFS40	745	55	41	12+18	10%	>13,5
UFS110	745	140	105	23+32	5%	>5,3

### Standard Kit for mains up to 440Vac

Unit	SCS kit		Connection	Overall Resistance	Overall power continuous duty S1	Max power intermittent duty S3 ED 5% (Max 2s cont.)	Dimension s 1 pc L/W/H.
UFS15	RUFC15	1 pz. x 40Ω 1200W		40Ω -0%+10%	1,2 kW	14kW	310/100/75
UFS22	RUFC22	1 pz x 24Ω 2000W		24Ω -0%+10%	2 kW	23kW	365/100/75
UFS40	RUFC40	2 pz. x 6,8Ω 2000W		13,6Ω -0%+10%	4 kW	40kW	365/100/75
UFS110	RUFC110	4 pz. x 6,8Ω 2000W		6,8Ω -0%+10%	8 kW	81kW	365/100/75

### Standard Kit for mains up to 330Vac

Unit	SCS Kit		Connection	Total resistance	Total power S1 continuous service	Total power S3 cyclic service ED 5% (Max 2s continuous)*	Dimensions 1 piece L/W/H.
UFS15J	RUFC15J	1 pz. x 24Ω 800W		24Ω -0%+10%	0.8kW	6kW	240x100x75
UFS22J	RUFC22J	1 pz x 12Ω 1200W		12Ω -0%+10%	1.2 kW	12kW	310x100x75
UFS40J	RUFC40J	1 pz. X7.5Ω 2000W		7,5Ω -0%+10%	2kW	19kW	365x100x75

## TECHNICAL SPECIFICATIONS

- Tolerance on the intervention voltage: 0.8%
- Hysteresis about 2%
- Ambient temperature 0°C ÷ 40°C
- Maximum braking time = 10s
- Protection degree IP20
- Thermal guard with manual / automatic reset
- DC supply voltage from 450Vdc to 746Vdc (234Vdc÷373dc for J version)
- Maximum voltage 800Vdc (400Vdc for J version)
- Main supply voltage from 380Vac to 480Vac +/-10%. (200Vac to 240Vac ±10% for J version)





# RUFC

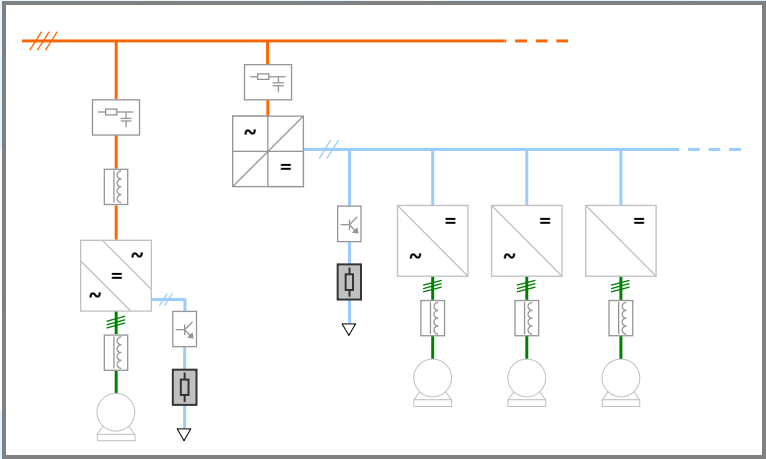
## BRAKING RESISTORS

### GENERAL DESCRIPTION

The RUFC braking resistors are designed to be connected with UFS braking units so that a braking kit is available for any application of frequency inverter or converter equipped with BUS-DC.

### MAIN FEATURES

- excellent performances/dimensions ratio
- low thermal resistance (from 0,6°C/W to 0,24 °C/W)
- easy mounting
- no smoke or fumes
- ROHS compliant



### ORDERING DATA REFERENCE TABLE

SCS kit		Overall Resistance	Overall power continuous duty S1	Dimensions [mm] L/W/H
RUFC15	1 pz. x 40Ω 1200W	40Ω -0%+10%	1,2 kW	310/100/75
RUFC22	1 pz x 24Ω 2000W	24Ω -0%+10%	2 kW	365/100/75
RUFC40	2 pz. x 6,8Ω 2000W	13,6Ω -0%+10%	4 kW	365/100/75
RUFC110	4 pz. x 6,8Ω 2000W	6,8Ω -0%+10%	8 kW	365/100/75
RUFC15J	1 pz. x 24Ω 800W	24Ω -0%+10%	0.8kW	240x100x75
RUFC22J	1 pz x 12Ω 1200W	12Ω -0%+10%	1.2 kW	310x100x75
RUFC40J	1 pz. X7.5Ω 2000W	7,5Ω -0%+10%	2kW	365x100x75



# LT

## LINE INDUCTANCES

### GENERAL DESCRIPTION

Line inductances can be used coupled with SCS products in both line-side or motor-side configuration.  
Single phase and three phase families are available for both DC drives and AC drives coupling.

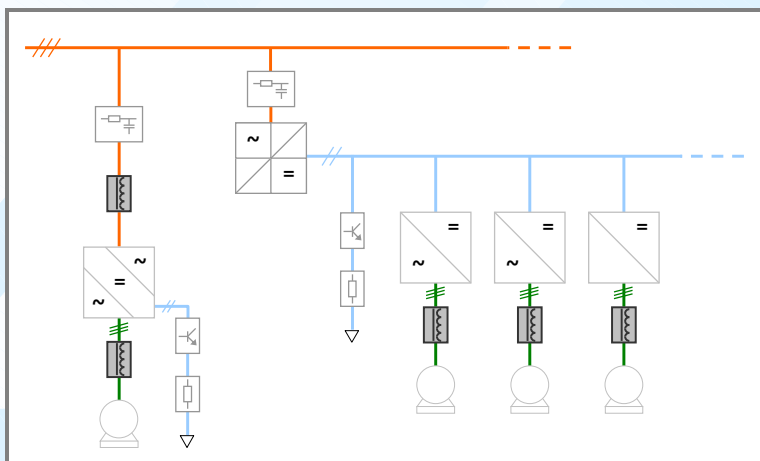
### MAIN FEATURES

- Type test: ENEC 05 - cCSAus - KemaKeur
- Standards : EN 61558-2-13/CSA C.22 N°66/1988/UL 506
- Intended use: Associated
- Short circuit protection: Not-short circuit proof transformers
- Protection against electric shock: Class 1
- Time of operation: Continuous
- Protection level: IP 00/Open core
- Terminals degree protection: IP 20/Finger protection
- Max. ambient temperature: 40°C
- Insulation class: cCSAus: B - 130°C / cULus: F - 155°C
- Frequency: 50/60 Hz
- Tropicalized execution: vacuum pressure varnish



### NOTES

Armature or levelling inductance are also available to improve shape factor and avoid overheating of DC Motors and Driver and to reduce brush consumption allowing a lower maintenance and a longer life.  
The inductance type are determined with respect to the motor's characteristics and are mandatory in case of SCR Drive and Permanent Magnet Motor coupling.



### REFERENCE TABLE

CODE	DESCRIPTION	COUPLED WITH
From LT160 To LT137	Three-Phase inductances	<b>DCB40</b>
From LT163 To LT147	Three-Phase inductances	<b>DCB44</b>
From LT166 To LT157	Three-Phase inductances	<b>DCB48</b>
From LT40 To LT58	Three-Phase inductances for DC Drives	<b>CT38, CH220</b>
From LT117, LT117A To LT123, LT123A	Input-Output Three-Phase inductances	<b>CVSII</b>



# RF

## EMC FILTERS FOR INVERTERS AND CONVERTERS

### GENERAL DESCRIPTION

The range of filters offered by SCS has been specially developed for the total accomplishment of the European standards (EN 50081-1 and EN 50081-2).

The measure results for the whole range of filters allow the EMC certification and the possibility of incorporating the CE distinctive to each product.

### SPECIAL FEATURES

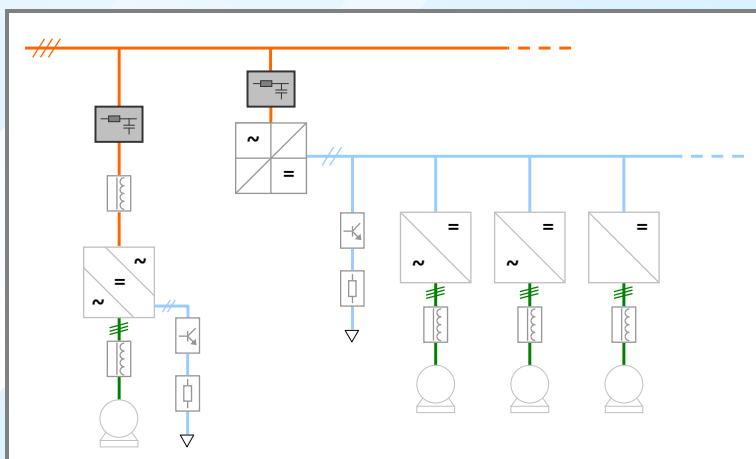
The EMC Filters can be used both in cabinet configuration (power filters) and in footprint configuration to be coupled directly to the inverters.

FE and FD filter family is certified for Mitsubishi FR-E and FR-D inverters.

### MAIN FEATURES

All the filters are manufactured with homologated components:

- Class X and Y Capacitors (VDE, SEMCO, CSA, etc.)
- Protected connection input and output terminals (UL, CSA, VDE, etc.)
- Isolated nuclei with material according to UL94 V0 standard
- Sealed resins according to UL94 V0



### Example: MITSUBISHI INVERTERS COUPLING

	CODICE SCS	Tipo	Descrizione SCS	Abbinamento filtri
FR-D740	FD740-012/022/036-EC	Three Phase Filter 05A.	Filtro EMC per FR-D 740 012-022-036-EC	FR-D740-012-EC (0.4kw) FR-D740-022-EC (0.75kw) FR-D740-036-EC (1.5kw)
	FD740-050/080-EC	Three Phase Filter 15A.	Filtro EMC per FR-D 740 050-080-EC	FR-D740-050-EC (2.2kw) FR-D740-080-EC (3.7kw)
	FD740-120/160-EC	Three Phase Filter 30A.	Filtro EMC per FR-D 740 120-160-EC	FR-D740-120-EC (5.5kw) FR-D740-160-EC (7.5kw)
FR-E740	FE740-016/026/040-EC	Three Phase Filter 05A.	Filtro EMC per FR-E 740 016-026-040-EC	FR-E740-016-EC (0.4kw) FR-E740-026-EC (0.75kw) FR-E740-040-EC (1.5kw)
	FE740-060/095-EC	Three Phase Filter 15A.	Filtro EMC per FR-E 740 060-095-EC	FR-E740-060-EC (2.2kw) FR-E740-095-EC (3.7kw)
	FE740-120/170-EC	Three Phase Filter 30A.	Filtro EMC per FR-E 740 120-170-EC	FR-E740-120-EC (5.5kw) FR-E740-170-EC (7.5kw)
	FE740-230/300-EC	Three Phase Filter 70A.	Filtro EMC per FR-E 740 230-300-EC	FR-E740-230-EC (11kw) FR-E740-300-EC (15kw)



# Control Systems



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