



Starting motors with traditional methods

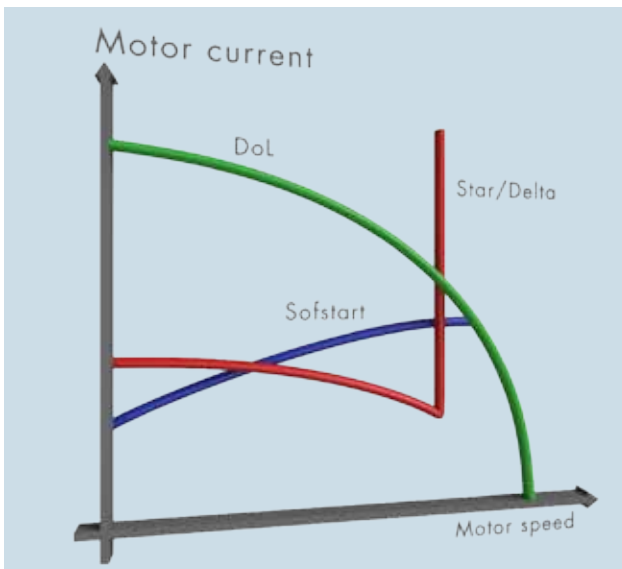
When starting an AC motor, the instantaneous (inrush) current can reach a level of 5 to 8 times the motor rated current. With high efficiency motors (IE2, IE3, IE4) the inrush current can also reach 15 times the motor rated current.

Direct on Line (D.O.L.) start results in:

- High starting current causing severe torque oscillations as well as belt slippage
- Possibility of light flickering and electrical disturbance on voltage network

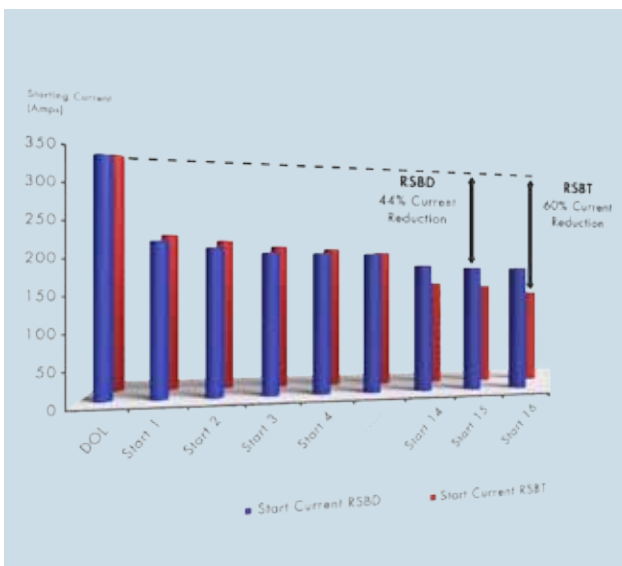
Star-delta starters result in:

- Severe torque oscillations during transition from star to delta
- More wiring costs and less space in the electrical cabinet
- Possibility of water hammering in centrifugal pumps since no soft stop is possible



Mechanical and electrical stresses on your machines

- Water hammering and cavitation in pumps reduces pump lifetime
- Increased wear and tear on joints and shafts increases maintenance costs
- Light flickering and voltage sags may interfere with other electrical equipment
- Vibrations on the motor during start and stop can result in excessive noise levels



The benefits of Carlo Gavazzi soft starters

If you have experienced any of the above problems, we can provide you with self-learning and easy to use soft starters that can also be customised to your specific needs.

The soft starters are designed to:

- Limit the motor inrush current
- Start and stop the motors in a smoother way

This results in:

- Lower maintenance costs
- Less disturbance on the electrical network
- Longer motor lifetime

OUR SALES NETWORK IN EUROPE

AUSTRIA

Carlo Gavazzi GmbH
Ketzergasse 374,
A-1230 Wien
Tel: +43 1 888 4112
Fax: +43 1 889 10 53
office@carlogavazzi.at

BELGIUM

Carlo Gavazzi NV/SA
Mechelsesteenweg 311,
B-1800 Vilvoorde
Tel: +32 2 257 4120
Fax: +32 2 257 41 25
sales@carlogavazzi.be

DENMARK

Carlo Gavazzi Handel A/S
Over Hadstenevej 40,
DK-8370 Hadsten
Tel: +45 89 60 6100
Fax: +45 86 98 15 30
handel@gavazzi.dk

FINLAND

Carlo Gavazzi OY AB
Petaksentie 2-4,
FI-00630 Helsinki
Tel: +358 9 756 2000
Fax: +358 9 756 20010
myynti@gavazzi.fi

FRANCE

Carlo Gavazzi Sarl
Zac de Paris Nord II, 69, rue de la Belle Etoile,
F-95956 Roissy CDG Cedex
Tel: +33 1 49 38 98 60
Fax: +33 1 48 63 27 43
french.team@carlogavazzi.fr

GERMANY

Carlo Gavazzi GmbH
Pfnorstr. 10-14
D-64293 Darmstadt
Tel: +49 6151 81000
Fax: +49 6151 81 00 40
info@gavazzi.de

GREAT BRITAIN

Carlo Gavazzi UK Ltd
4.4 Frimley Business Park,
Frimley, Camberley, Surrey GU16 7SG
Tel: +44 1 276 854 110
Fax: +44 1 276 682 140
sales@carlogavazzi.co.uk

ITALY

Carlo Gavazzi SpA
Via Milano 13,
I-20020 Lainate
Tel: +39 02 931 761
Fax: +39 02 931 763 01
info@gavazziacbu.it

NETHERLANDS

Carlo Gavazzi BV
Wijkermeerweg 23,
NL-1948 NT Beverwijk
Tel: +31 251 22 9345
Fax: +31 251 22 60 55
info@carlogavazzi.nl

NORWAY

Carlo Gavazzi AS
Melkeveien 13,
N-3919 Porsgrunn
Tel: +47 35 93 0800
Fax: +47 35 93 08 01
post@gavazzi.no

PORTUGAL

Carlo Gavazzi Lda
Rua dos Jerónimos 38-B,
P-1400-212 Lisboa
Tel: +351 21 361 7060
Fax: +351 21 362 13 73
carlogavazzi@carlogavazzi.pt

SPAIN

Carlo Gavazzi SA
Avda. Iparraguirre, 80-82,
E-48940 Leioa (Bizkaia)
Tel: +34 94 480 4037
Fax: +34 94 431 6081
gavazzi@gavazzi.es

SWEDEN

Carlo Gavazzi AB
V:a Kyrkogatan 1,
S-652 24 Karlstad
Tel: +46 54 85 1125
Fax: +46 54 85 11 77
info@carlogavazzi.se

SWITZERLAND

Carlo Gavazzi AG
Verkauf Schweiz/Vente Suisse
Sumpfstrasse 3,
CH-6312 Steinhausen
Tel: +41 41 747 4535
Fax: +41 41 740 45 40
info@carlogavazzi.ch

OUR SALES NETWORK IN THE AMERICAS

USA

Carlo Gavazzi Inc.
750 Hastings Lane,
Buffalo Grove, IL 60089, USA
Tel: +1 847 465 6100
Fax: +1 847 465 7373
sales@carlogavazzi.com

CANADA

Carlo Gavazzi Inc.
2660 Meadowvale Boulevard,
Mississauga, ON L5N 6M6, Canada
Tel: +1 905 542 0979
Fax: +1 905 542 22 48
gavazzi@carlogavazzi.com

MEXICO

Carlo Gavazzi Mexico S.A. de C.V.
Calle La Montaña no. 28, Fracc. Los Pastores
Naucalpan de Juárez, EDMEX CP 53340
Tel & Fax: +52.55.5373.7042
mexicosales@carlogavazzi.com

BRAZIL

Carlo Gavazzi Automação Ltda. Av.
Francisco Matarazzo, 1752
Conj 2108 - Barra Funda - São Paulo/SP
Tel: +55 11 3052 0832
Fax: +55 11 3057 1753
info@carlogavazzi.com.br

OUR SALES NETWORK IN ASIA AND PACIFIC

SINGAPORE

Carlo Gavazzi Automation Singapore Pte. Ltd.
61 Tai Seng Avenue
#05-06 UE Print Media Hub
Singapore 534167
Tel: +65 67 466 990
Fax: +65 67 461 980
info@carlogavazzi.com.sg

MALAYSIA

Carlo Gavazzi Automation (M) SDN. BHD.
D12-06-G, Block D12,
Pusat Perdagangan Dana 1,
Jalan PJU 1A/46, 47301 Petaling Jaya,
Selangor, Malaysia.
Tel: +60 3 7842 7299
Fax: +60 3 7842 7399
sales@gavazzi-asia.com

CHINA

Carlo Gavazzi Automation
(China) Co. Ltd.
Unit 2308, 23/F.,
News Building, Block 1, 1002
Middle Shennan Zhong Road,
Shenzhen, China
Tel: +86 755 83699500
Fax: +86 755 83699300
sales@carlogavazzi.cn

HONG KONG

Carlo Gavazzi Automation
Hong Kong Ltd.
Unit 3 12/F Crown Industrial Bldg.,
106 How Ming St., Kwun Tong,
Kowloon, Hong Kong
Tel: +852 23041228
Fax: +852 23443689

OUR COMPETENCE CENTRES AND PRODUCTION SITES

DENMARK

Carlo Gavazzi Industri A/S
Hadsten

MALTA

Carlo Gavazzi Ltd
Zejtun

ITALY

Carlo Gavazzi Controls SpA
Belluno

LITHUANIA

Uab Carlo Gavazzi Industri Kaunas
Kaunas

CHINA

Carlo Gavazzi Automation (Kunshan) Co., Ltd.
Kunshan

HEADQUARTERS

Carlo Gavazzi Automation SpA
Via Milano, 13
I-20020 - Lainate (MI) - ITALY
Tel: +39 02 931 761
info@gavazziautomation.com



CARLO GAVAZZI
Automation Components

Energy to Components!

www.gavazziautomation.com





Overview

Soft starters

Overview

Soft starters

RSWT – Centrifugal pump soft starters

Carlo Gavazzi's RSWT series is an intelligent 3-phase controlled soft starting solution: the self-learning algorithm ensures optimal pump starts and stops even under different load conditions.

- Designed specifically for 3-phase centrifugal pumps
- Self-learning algorithm to reduce water hammering at start and stop
- Quick and easy to set-up
- Three phase controlled with internal bypass
- Integrated overload protection (Class 10)
- Compact dimensions
- Diagnostic functions



RSBS, RSBD, RSBT – Scroll compressor soft starters

Carlo Gavazzi's line of dedicated scroll compressor soft starters RSBS, RSBD and RSBT is the result of an extensive study of scroll compressor systems.

- Designed specifically for 1-phase (RSBS) and 3-phase (RSBD, RSBT) scroll compressors
- Patented self-learning algorithm to reduce compressor inrush current
- No user settings required
- Compact dimensions
- Eliminates light flickering
- Conforms to EMC residential requirements (RSBS, RSBT - up to 32 A)
- Internally bypassed solutions



RSGD - General purpose soft starters

RSGD soft starters are designed in an extremely compact housing and are suitable for 3-phase induction motors up to 100 A, providing an easy fit in the electrical panel.

- Designed for 3-phase AC motors
- Current balancing algorithm for smoother motor starts and stops
- Reduces mechanical shocks to motors and couplings
- Minimal user settings required
- Compact dimensions
- Diagnostic functions
- Internally bypassed



Overview

Soft starters

RSWT - Centrifugal pump soft starters



	RSWT 45 mm	RSWT 75 mm	RSWT 120 mm
Housing (H x W x D)	150 x 45 x 105 mm	180 x 75 x 221 mm	180 x 120 x 221 mm
Operational voltage	RSWT40: 220 - 400 VAC, RSWT60: 220 - 600 VAC (+10%, -15%)		
Operational current	12/16/25 AAC	32/37/45/55 AAC	70/90 AAC
Power range 240 VAC	3 kW to 5.5 kW (3 HP to 7.5 HP)	9 kW to 15 kW (10 HP to 20 HP)	20 kW to 30 kW (25 HP to 30 HP)
Power range 415 VAC	5.5 kW to 11 kW (5 HP to 10 HP)	15 kW to 30 kW (15 HP to 30 HP)	37 kW to 45 kW (40 HP to 50 HP)
Power range 480 VAC	5.5 kW to 11 kW (7.5 HP to 15 HP)	18.5 kW to 30 kW (20 HP to 40 HP)	45 kW to 55 kW (50 HP to 60 HP)
Power range 600 VAC	9 kW to 20 kW (10 HP to 20 HP)	22 kW to 45 kW (30 HP to 50 HP)	55 kW to 75 kW (60 HP to 75 HP)
Starts per hour	20	20	20
Controlled phases	3	3	3
Internally bypassed	Yes	Yes	Yes
Relay outputs	2	3	3
PTC input	No	Yes	Yes
Integrated overload protection (Class 10)	V10 models	V011/V111 models	V111 models
Approvals	CE - cULus Listed		



RSWT 3-phase soft starter series up to 45 kW

Features

- Self-learning algorithm
- Simple user interface
- True three phase control
- Integrated overload protection
- 20 starts per hour
- Compact footprint
- Internal bypass

Benefits

- Ensures smoother pump starts and stops
- Reduces installation time
- Results in better current reduction
- More protection for your pumps
- Higher installation flexibility
- Facilitates replacement of DOL starters
- Reduces total installation cost

Soft starters

RSBS, RSBD – Scroll compressor soft starters



	RSBS (1-phase)	RSBD Compact	RSBD 75 mm
Housing (H x W x D)	60.4 x 76 x 137.2 mm	125 x 45 x 105 mm	170 x 75 x 150 mm
Operational voltage	230 VAC	220 - 400 VAC	220- 600 VAC
Operational current	25/32 AAC	12/16/25/32/37/45 AAC	55/70/95 AAC
Power range 220 - 240 VAC	4.4 kW (5 HP)	3 kW to 11 kW (3 HP to 15 HP)	15 kW to 22 kW (20 HP to 30 HP)
Power range 380 - 415 VAC	-	5.5 kW to 22 kW (5 HP to 25 HP)	30 kW to 45 kW (30 HP to 50 HP)
Power range 440 - 480 VAC	-	-	30 kW to 55 kW (40 HP to 60 HP)
Power range 550 - 600 VAC	-	-	45 kW to 75 kW (50 HP to 75 HP)
Maximum starts per hour @40°C	"12 (for RSBS23..A2V.2C24) 10 (for RSBS23..A2V.2C24HP)"	12	12
Controlled phases	1	2	2
Internally bypassed	Yes	Yes	Yes
Relay outputs	1 (option V22 model)	2 (option V61HP model)	3
Approvals	CE - cULus	CE - cULus - CCC	CE - cULus - CCC



RSBS Single phase soft starters up to 32 AAC

Features

- Current limiting algorithm
- No user settings required
- Integrated diagnostic functions
- High pressure (HP) algorithm
- Conforms to Class B limits for EMC
- Alarm relay output

Benefits

- Reduces light flickering and voltage disturbance
- Tamper-proof design
- Quicker diagnosis of problems in the heat pump
- Algorithm self-adjusts the maximum starting current in case of high pressure starts
- No need for additional EMC filters
- Easier fault diagnostics

RSBD 2-phase controlled soft starters up to 95 AAC

Features

- No user settings required
- Self-learning algorithm for start current reduction
- Current balancing algorithm
- 45 A in 45 mm wide housing
- 95 A in 75 mm wide housing
- Internally bypassed solution
- HP algorithm for multi-compressor systems

Benefits

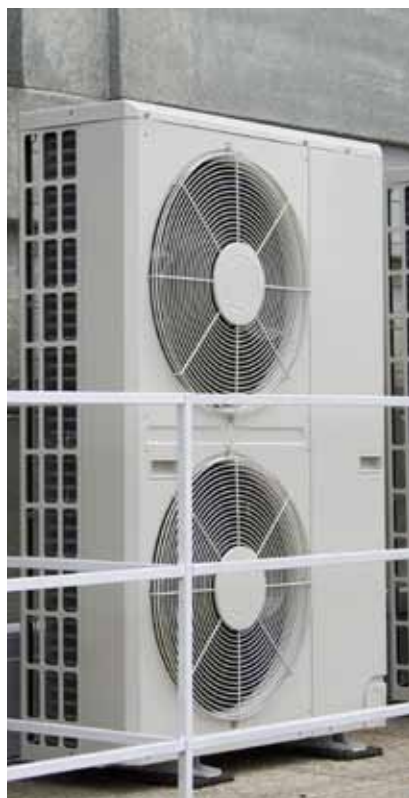
- The easiest soft starter to use
- Reduces compressor start current by an average of 40% vs Direct on line
- Ensures compressor starts with lowest current within less than 1 second
- Less heat dissipation inside the electrical panel
- HP algorithm ensures that compressor starts even at high pressure difference

Soft starters

RSBT – Scroll compressor soft starters



	RSBT Compact	RSBT 120 mm
Housing (H x W x D)	125 x 45 x 81 mm	170 x 120 x 150 mm
Operational voltage	220- 400 VAC	220- 480 VAC
Operational current	16/25/32 AAC	55/70/95 AAC
Power range 220 - 240 VAC	4 kW to 9 kW (5 HP to 10 HP)	15 kW to 22 kW (20 HP to 30 HP)
Power range 380 - 415 VAC	7.5 kW to 15 kW (7.5 HP to 15 HP)	30 kW to 45 kW (30 HP to 50 HP)
Power range 440 - 480 VAC	-	30 kW to 55 kW (40 HP to 60 HP)
Maximum starts per hour @40°C	12	12
Controlled phases	3	3
Internally bypassed	Yes	Yes
Relay outputs	1 (optional with RFPM module)	2
Approvals	CE - cULus - VDE - CCC	CE - cULus - CCC



RSBT 3-phase controlled soft starters up to 95 AAC

Features

- Patented self-learning algorithm for compressor start current reduction
- No user settings required
- Compliance with EMC class B (residential) limits
- Internally bypassed solution
- Up to 32 Arms in 45 mm wide housing
- User-friendly alarm indication
- Serial communication (RS485)
- HP algorithm for multi-compressor systems
- Additional plug-in modules available

Benefits

- >50% Start current reduction vs Direct on Line
- Greatly reduces any light flickering
- Fewer vibrations in the pipes and joints
- Meets the most demanding limits for emissions – hence no need for additional filters
- Easier fault-finding in case of abnormal conditions
- Communication with machine controller for energy consumption, soft start status, ON/OFF control and alarms
- Installation flexibility with different configurations

Soft starters

RSGD - General purpose soft starters



	RSGD (Up to 32 A)	RSGD (37 A to 45 A)	RSGD (55 A to 100 A)
Housing (H x W x D)	125 x 45 x 105 mm	125 x 45 x 150 mm	180 x 75 x 221 mm
Operational voltage	RSGD40: 220 - 400 VAC, RSGD60: 220 - 600 VAC (+10%, -15%)		
Operational current	12/16/25/32 AAC	37/45 AAC	55/70/85/100 AAC
Motor power @ 220 - 240 VAC	3 kW to 9 kW (3 HP to 10 HP)	9 kW to 11 kW (10 HP to 15 HP)	15 kW to 30 kW (20 HP to 30 HP)
Motor power @ 380 - 415 VAC	5.5 kW to 15 kW (5 HP to 15 HP)	18.5 kW to 22 kW (20 HP to 25 HP)	30 kW to 45 kW (30 HP to 50 HP)
Motor power @ 440 - 480 VAC	5.5 kW to 18.5 kW (7.5 HP to 20 HP)	22 kW (25 HP to 30 HP)	30 kW to 55 kW (40 HP to 60 HP)
Motor power @ 550 - 600 VAC	9 kW to 22 kW (10 HP to 30 HP)	30 kW to 37 kW (30 HP to 40 HP)	45 kW to 75 kW (50 HP to 75 HP)
Maximum starts per hour @ 40°C	20/20/20/10	10/10	10/10/10/10
Controlled phases	2	2	2
Internally bypassed	Yes	Yes	Yes
Relay Outputs	2	2	3
Integrated overload protection (Class 10)	No	No	Yes
PTC Input	No	No	Yes
Approvals	CE - cULus - CCC		



RSGD 3-phase compact soft starters up to 45 AAC

Features

- Compact 45 mm wide housing up to 45 AAC
- Current balancing algorithm
- HP Algorithm
- Multi-voltage operation
- Integrated phase sequence protection
- Improved inrush current reduction

Benefits

- Facilitates replacement of mechanical contactors
- Extended motor lifetime through lower current unbalance
- Results in fewer alarms in case of load fluctuations
- Less inventory
- Increased motor protection in case of abnormal conditions
- Increases installation flexibility and reduces wiring time

RSGD 3-phase compact soft starters from 55 AAC to 100 AAC

Features

- Compact 75 mm wide housing up to 100 AAC
- Self-learning algorithm
- Integrated overload protection (Class 10)
- Built-in Modbus RTU (RS485 2-wire)
- Only 3 adjustments required
- 3 signal relays for alarm, top of ramp, run indication and PTC input

Benefits

- Less panel space required
- Optimises motor starting in different load conditions
- Protects the motor in case of anomalous working conditions
- Facilitates diagnostics and energy monitoring
- Extremely easy to use and quick to set up
- Increased installation flexibility