

LOW VOLTAGE

# SOFT STARTERS



AND DC INJECTION BRAKES



# Analogue



Reverse

0.5  
Ramp-Down  
5 Sec

Run

SOLCON

STOP

10 80%  
Initial Voltage

0.5  
Ramp-Up  
5 Sec

Ramp

On



## Solbrake DC Injection Brake 10-390A



## Solstart Miniature Soft Starter 8-170A, with a built-in bypass

**For Three Phase or Single Phase Motors**



KW 400V	Brake Type Ampere	Dimensions (mm)			Wt. (Kg)
		W	H	D	
5.0 *	Solbrake 10 *	90	75	105	0.5
7.5	Solbrake 17	65	190	114	1.3
15	Solbrake 31	65	190	114	1.3
30	Solbrake 58	65	190	114	1.3
55	Solbrake 105	154	280	168	5.0
90	Solbrake 170	154	280	168	5.0
110	Solbrake 210	154	280	168	5.4
160	Solbrake 310	224	384	222	12
200	Solbrake 390	224	384	222	12

\* Note: 5.5KW at 415V

KW 400V	Starter Type Ampere	Dimensions (mm)			Wt. (Kg)
		W	H	D	
4	Solstart 8	45	75	110	0.4
7.5	Solstart 17	90	75	105	0.6
11	Solstart 22	90	75	105	0.6
15	Solstart 31	65	190	114	1.3
22	Solstart 44	65	190	114	1.3
30	Solstart 58	65	190	114	1.3
37	Solstart 72	120	265	121	5.0
45	Solstart 85	120	265	121	5.0
55	Solstart 105	120	265	121	5.0
75	Solstart 145	129	275	185	8.0
90	Solstart 170	129	275	185	8.0



### Advantages at a glance

The Solbrake Electronic Motor Brake provides fast, smooth & frictionless stopping of a three induction phase motor, by injecting controlled DC current to the motor windings, after the mains contactor opened.

- Preventing mechanical wear
- Reducing stopping time of high inertia loads
- Adjustable braking time
- Auto stop - DC Injection stops when motor stops
- DIN Rail mounting (Standard 10A, option 17-58A)
- Easy installation & operation



### Standard ratings

- Voltages: 230, 400, 460 & 600V (105-390A are available up to 690V)

### Settings

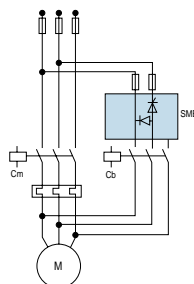
- Braking Torque - Determines the DC current level injected to the motor windings
- Two operation modes
  - Auto Mode: DC Injection stops automatically when motor stops.
  - Manual Mode: DC Injection stops after the pre-adjusted braking time. This mode can be used to "hold" the load at stand still.

### Displays (LEDs)

- Mains voltage connected
- Braking Contactor Closed
- DC Injection On

### Applications

- Circular and band (flywheel) saws
- Machine tools
- Fast stopping of high inertia loads
- Safety brakes (as long as mains supply remains on)



### Advantages at a glance

- Soft start & Soft stop
- Built-in bypass
- Start / Stop by voltage free contact
- End of Acceleration contact, one-N.O (31-58A only)
- Compact, small foot print
- Plastic case 8-22A, Aluminum case for 31-58A
- DIN Rail mounting (Standard 8-22A, option 31-58A)
- Cost effective

### Option

- Single phase motor soft starters

### Standard ratings

- Voltages: 230, 400, 440, 460 & 600V
- 50 and 60 Hz

### Starter Protection

- SCR protection by Metal Oxide Varistors

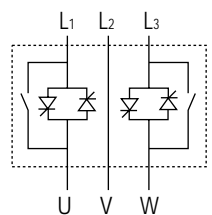
### Displays (LEDs)

- On - mains voltage connected
- Ramp - voltage is ramping up / down
- Run - motor is running

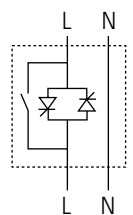
### Applications

- Appliances
- Machine tools
- Electrically driven gates
- Light duty motors in commercial applications
- Small conveyors (post office, supermarkets, etc.)

### Three phase motors



### Single phase motors



**Contact us for quantity discount and / or special design features**

**Solstart Plus**  
Analogue Soft Starter 17-170A,  
with a built-in bypass



**RVS-AX**  
Analogue Soft Starter 8-170A,  
with a built-in bypass

**Line or Inside Delta connection**



**Solstart Plus**

	KW	Starter Type	Dimensions (mm)			Wt. (Kg)
			W	H	D	
Future Option	7.5	Solstart Plus 17	90	75	105	0.6 <sup>1</sup>
Future Option	11	Solstart Plus 22	90	75	105	0.6
	15	Solstart Plus 31	65	190	114	1.4
	22	Solstart Plus 44	65	190	114	1.4
	30	Solstart Plus 58	120	265	121	3.5
	37	Solstart Plus 72	120	265	121	3.5
	45	Solstart Plus 85	120	265	121	3.5
	55	Solstart Plus 105	120	265	121	3.5
	75	Solstart Plus 145	129	275	182	6.5
	90	Solstart Plus 170	129	275	182	6.5

**RVS-AX**

KW	Starter Type	Dimensions (mm)			Wt. (Kg)
		W	H	D	
4	RVS-AX 8	120	232	105	2.6
7.5	RVS-AX 17	120	232	105	2.6
15	RVS-AX 31	120	232	105	2.6
22	RVS-AX 44	120	232	105	2.6
30	RVS-AX 58	129	275	185	5.0
37	RVS-AX 72	129	275	185	5.0
45	RVS-AX 85	129	380	185	8.4
55	RVS-AX 105	129	380	185	8.4
75	RVS-AX 145	172	380	195	11.8
90	RVS-AX 170	172	380	195	11.8

<sup>1</sup> Consult factory for final dimensions



**Advantages at a glance**

- Two phase control
- Soft start & Soft stop
- Current Limit
- Built-in motor Protection
- Built-in bypass
- Start / Stop by voltage free contact
- End of Acceleration Relay
- Fault Relay
- Compact, small foot print
- Aluminum case
- DIN Rail mounting (option for 31-44A, standard for 17-22A)
- Cost effective

**Standard ratings**

- Voltages: 208, 230, 400, 440, & 600V
- 50 and 60 Hz

**Motor & Starter Protection**

- Electronic overload
- Starter over-temperature
- SCR protection by Metal Oxide Varistors

**Displays (LEDs)**

- On - mains voltage connected
- Ramp Up / Down
- Run
- Overload
- Over Temperature

**Applications**

- Pumps, Fans, Compressors
- Conveyors & Monorail systems
- Machine tools



**Advantages at a glance**

- Soft start & Soft stop
- Current Limit
- Built-in motor Protection
- Built-in bypass (31-170A only)
- Start / Stop by voltage free contact
- Compact, small foot print
- Aluminum case
- Line or Inside Delta connection

**Standard ratings**

- Voltages: 230, 400, 440, 460 & 600V
- 50 and 60 Hz

**Motor & Starter Protection**

- Electronic overload
- Phase loss
- Starter over-temperature
- SCR protection by Metal Oxide Varistors

**Displays (LEDs)**

- On - mains voltage connected
- Ramp Up / Down
- Run
- Overload
- Phase Loss
- Over Temperature

**Auxiliary Relays**

- End of Acceleration Relay, one-N.O contact
- Fault Relay, one-N.O contact

**Applications**

- Pumps
- Compressors
- Fans & Blowers
- Conveyors & Monorail systems
- Starting from weak power supplies (diesel generators, long supply lines, etc.).

**Contact us for quantity discount and / or special design features**

**HCC**  
Horizontal Crane Controller



**SEM-N**  
Naval & Military applications



**RVS-EX**  
8-3500A, 208-1000V  
RVS-DN for Explosion Proof motors



**RVS-DN**  
8-3500A, 1000V applications  
Stainless Steel and Copper construction for severe mining environments



**RVS-TX**  
Digital Transformer Starter  
8-3500A, 220-1000V  
Eliminating the magnetising inrush current of transformers in either low or medium voltage



# Digital

INSULATION ALARM  
1.2 Mohm



- On
- Start
- Run
- S.Stop
- Stop
- E.Save Slow
- D.Adj./ Rev.
- Fault

- Start
- Run
- S.Stop
- Stop
- E.Save/Slow
- D.Adj./Rev
- Fault



## RVS-DX Digital Soft Starter 8-1100A, with a built-in bypass

**Line or Inside Delta connection**



### RVS-DX

KW 400V	Starter Type Ampere	Dimensions (mm)			Wt. (Kg)
		W	H	D	
4	RVS-DX 8	120	232	122	3.1
7.5	RVS-DX 17	120	232	122	3.1
15	RVS-DX 31	120	232	122	3.1
22	RVS-DX 44	120	232	122	3.1
30	RVS-DX 58	129	275	182	5.2
37	RVS-DX 72	129	275	182	5.2
45	RVS-DX 85	129	380	182	8.5
55	RVS-DX 105	129	380	182	8.5
75	RVS-DX 145	172	380	192	11.7
90	RVS-DX 170	172	380	192	11.7
110	RVS-DX 210	172	380	192	30.2 <sup>1</sup>
160	RVS-DX 310	310	521	300	30.2
200	RVS-DX 390	310	521	300	55
250	RVS-DX 460	455	683	328	65
315	RVS-DX 580	455	683	328	75
400	RVS-DX 650	455	683	328	80
450	RVS-DX 820	455	683	328	90
550	RVS-DX 950	515	833	341	100
630	RVS-DX 1100	515	833	341	100

<sup>1</sup> Consult factory for final dimensions



#### Motor & Starter Protection

- Too many starts
- Long start time (Stall)
- Shear-pin (Electronic Fuse for start & run)
- Electronic overload (with selectable curves)
- Under Current
- Phase loss & Phase Sequence
- Under, Over and No voltage
- Load loss (motor not connected)
- Shorted SCR
- Starter over-temperature
- External Fault (Programmable input)
- SCR protection (by Metal Oxide Varistors)

#### Displays

- LCD - Two lines of 16 characters each
- Multilingual - English, German, French & Spanish
- Four LEDs - On, Run, Ramp Up/Down, & Fault
- Statistical Data - Start, Stop & Fault parameters
- Full script parameter settings

#### Controls

- Opto isolated inputs
- Auxiliary relays: Fault, End Of Acceleration or Immediate (programmable)
- Local and Remote reset
- RS 485 Modbus Communications for full control, display and programming (Profibus-contact us)

#### Advantages at a glance

- Small footprint
- Complete line 8-1100A, 220-600V
- Third generation microprocessor based design circuitry
- Normal duty, fully rated design including built in bypass
- Aluminum case
- Superior starting & stopping characteristics
- Comprehensive Motor Protection
- RS 485 Modbus Communications
- Frequency autotracking 45-65Hz
- User friendly
- Line or Inside Delta connection
- Analog output

#### Standard ratings

- Voltages: 230, 400, 440, 460 & 600V

#### Starting & Stopping

- Soft start & soft stop
- Current Limit
- Pump Control Program (See description)
- Torque and Current Control
- Dual Adjustment
- Pulse start
- Slow speed forward and reverse
- Options:
- Fan control for severe duty cycle
- DOL Starting via external contact, contact us for further information

## RVS-DN Digital Soft Starter 8-3500A, Heavy Duty, Fully featured

**Line or Inside Delta connection**



### RVS-DN

KW 400V	Starter Type Ampere	Dimensions (mm)			Wt. (Kg)				
		W	H	D					
4	RVS-DN 8	153	310	170	4.5				
7.5	RVS-DN 17	153	310	170	4.5				
15	RVS-DN 31	153	310	170	6.0				
22	RVS-DN 44	153	310	217	7.4				
30	RVS-DN 58	153	310	217	7.4				
37	RVS-DN 72	153	310	217	7.4				
45	RVS-DN 85	274	385	238	15				
55	RVS-DN 105	274	385	238	15				
75	RVS-DN 145	274	385	238	15				
90	RVS-DN 170	274	385	238	15				
110	RVS-DN 210	380	590	455	292	290	31	44.8	
160	RVS-DN 310	380	590	455	500	292	290	31	44.8
200	RVS-DN 390	380	590	455	500	292	290	31	44.8
250	RVS-DN 460	380	623	555	660 <sup>2</sup>	292	290	55	65
315	RVS-DN 580	470	623	655	660 <sup>2</sup>	302	290	55	65
450	RVS-DN 820	470	623	715	660 <sup>2</sup>	302	290	65	65
550	RVS-DN 950	623	660 <sup>2</sup>	290	290	83.5			
630	RVS-DN 1100	723	1100	370	155				
800	RVS-DN 1400	723	1100	370	155				
950	RVS-DN 1800	723	1100	370	155				
1250	RVS-DN 2150	750	1300	392	240				
1400	RVS-DN 2400	900	1300	472	314				
1550	RVS-DN 2700	900	1300	472	314				



<sup>1</sup> Previous version

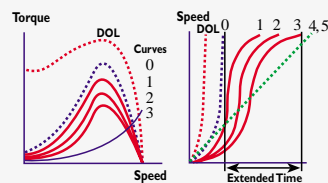
<sup>2</sup> When using bypass contactor, add 160mm for bus-bar extensions.

<sup>3</sup> Type test

#### Pump Control (common for RVS-DN, RVS-DX & HRVS-DN)

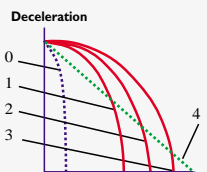
##### Start Curves

The RVS-DN (DX) incorporates an Intelligent Pump Control Program that allows selection between three special dynamic voltage ramp-up curves, and Torque or Current curves each further reducing peak torque thus extending acceleration time.



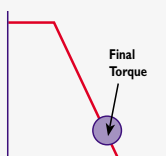
##### Stop Curves

When pumping to a higher elevation and motor is soft stopped, motor torque may quickly fall below load torque causing abrupt stalling instead of smoothly decreasing speed to zero. This will create a Water Hammer phenomenon resulting in a loud noise and damage to the pipe system. The Pump Control enables selection between 3 dynamic voltage ramp-down or Torque curves to prevent a stall condition and eliminate Water Hammer.



##### Final Torque

Prior to concluding the deceleration process, motor torque reaches a level where the load torque is higher than motor's torque and the valve closes. The motor continues to run against a closed valve (no load) until it stops. The Final Torque feature enables setting a point where the motor stops when the valve closes.





**HRVS-DN  
60-2500A, 1500-15000V  
Digital, Medium Voltage Soft Starter  
Heavy Duty, Fully featured**

Please inquire for our latest catalogue.

**Advantages at a glance**

- o Complete line 8-3500A, 220-1000V
- o Heavy duty, fully rated design
- o Robust construction
- o Superior starting & stopping characteristics
- o Comprehensive Motor Protection package
- o User friendly
- o Line or Inside Delta connection
- o Maximum ambient temperature: 50°C
- o Unique optional features including:
  - o Motor Insulation Tester
  - o RS 485 Comm. Modbus / Profibus / TCP-IP
  - o Thermistor input / Analogue output

**Starting & Stopping**

- o Soft start & soft stop
- o Current Limit
- o Pump Control Program
- o Torque and Current Control for optimized Starting & Stopping process
- o Dual Adjustments - Two Starting & Stopping Characteristics
- o Slow speed with electronic reversing
- o Pulse start
- o Linear Acceleration (tacho feedback)
- o Energy Save for improved Power Factor

**Standard ratings**

- o 230V, 400V, 500V, 600V, 690V, 1000V

**Motor & Starter Protection**

- o Too many starts
- o Long start time (Stall)
- o Shear-pin (Start+Run+Jam)
- o Electronic overload with selectable curves
- o Under Current with adjustable delays
- o Phase loss & Phase Sequence
- o Under, Over & No voltage
- o Load loss (motor not connected)
- o Shorted SCR
- o Starter over-temperature

**Displays LCD & LEDs**

- o LCD - 2 lines x 16 characters
- o Selectable languages: English, German, French & Spanish.
- o Two display modes for basic & advanced applications
- o Friendly operation with Default parameters
- o Eight LEDs for quick operational status
- o Statistical Data including:
  - o Total run time
  - o Total number of starts
  - o Total number of trips
  - o Last start current
  - o Last start time
  - o Last trip
  - o Current at trip



**Options**

- o RS 485 Communication (see details below)
- o Analogue Output (see details below)
- o Thermistor Input (see details below)
- o Motor Insulation Test (see details below)
- o Preparation for Bypass - to maintain protection when bypass is closed
- o Special Anti-Corrosive Treatment - special coating for harsh environments
- o Illuminated LCD
- o Special Tacho Feedback Circuitry
- o Remote Communication via Cellular, Internet and Satellite

**Communication (option)**

- o MODBUS RTU - enables Setting, Control & Supervision
- o PROFIBUS DP - enabling Control & Supervision
- o TCP/IP - MODBUS/TCP via standard RJ 45 computer network connector

**Analogue card (option)**

- Incorporates two functions:
- o Thermistor input, PTC or NTC
  - o Analogue output, related to motor's current, programmable as 0-10VDC, 4-20mA, 0-20mA or inverse

**Motor Insulation Tester (option)**

- A unique feature for submersible pumps, motors installed in harsh environments, etc. The system measures motor insulation when motor is not running. Two programmable levels are available:
- o Alarm level, adjustable 0.2-5 MOhm
  - o Start Disable level, adjustable 0.2-5 MOhm, preventing starting when insulation is below acceptable levels

**Auxiliary Relays**

- Programmable relays, one-C.O 8A, 220VAC
- o Immediate with adjustable On and Off delays. Can be dedicated for Shear-pin (Jam) protection.
  - o End of Acceleration, with adjustable On delay
  - o Fault, programmable as Fault or Fault-fail-safe operation.
  - o Low Motor Insulation Alarm (option)

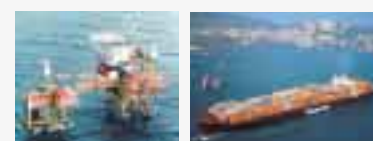
**Applications**

**Industrial**

- o Pumps
- o Hydraulic systems
- o Fans & Blowers
- o Compressors
- o Conveyors

**Marine & Offshore**

- o Complete line 8-3500A, 220-1000V
- o Heavy duty, fully rated design
- o Robust construction
- o Generator ready - auto frequency tracking, sustains variations of 45-65Hz while starting
- o User friendly operation
- o Unique protection for corrosive environments



The RVS-DN has Lloyds Type Approval for ENV1, ENV2. As well as, Germaniche Lloyds & Rina. (Low Voltage to 1400A) ABS, DNV and BV are type tested.

**1000V for Mining, Quarry & Mixers**

Digital, fiber optically controlled Soft Starter for 20-1000A, Robust, Heavy Duty, Fully featured (stainless steel with copper heatsink is available below 100A as well).



# Additional Products

Additional catalogues available from Solcon's product range

## HRVS-DN

High Voltage Digital Soft- Starter  
60-2500A, 1500-15000V



## TPS

Thyristor Power Supply (Heaters)  
Zero Crossing or Phase Control



## MPS-3000

Motor Protection & Control Relay



## MPR 2000 / MPC 2000

Motor Protection Relay  
Motor Protection Controller



## MPR 6/3

Motor Protection Relay



## MPC-6

Motor Protection, Control &  
Supervision Relay



## MPR-6-DGF

Motor Protection with  
Directional Ground Fault



## TPR-6

Digital Temperature  
Protection Relay



## MIP-6

Motor Insulation Protection Relay



## IPNP-RMU

Remote Monitoring/Supervision Unit  
Cellular, Internet, Satellite



## EPT

Electronic Potential Transformer  
2300-36000V



## DGC 2000

Digital Generator Control  
& Protection



## DPM 10

Digital Power Meter



## PFC 10

Reactive Power Factor Controller



## SU 124

Generator Control & Protection



## HIU

Restart Relay



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