



# PRODUCT GUIDE





# SOLCON



## Medium Voltage Soft Starters & Software

1.	HRVS-DN PowerStart	
	SCR-Based Medium Voltage Soft Starter 2.3 - 13.8kV	4
3.	DriveStart <sup>2</sup>	
	IGBT-Based Medium Voltage Soft Starter up to 11kV	6
Low	Voltage Soft Starters	
1.	iStart	
	Advanced, Digital Low Voltage Soft Starter 17-1100A, 208-690V	8
2.	RVS-DN	
	Heavy Duty, Digital Low Voltage Soft Starter 8-3000A, 220-1200V	10
5.	RVS-AXO	
	Compact, Low Voltage Soft Starter 3-75A, 220-500V	12
3.	RVS-AX	
	Analog, Low Voltage Soft Starter 8-170A, 220-600V	13
4.	Solbrake	
	DC Injection Brake 8-820A, 208-690V	13
Cont	trol Products	
1.	TPS	
	Low Voltage Thyristor Power Systems up to 1200V	14
2.	MV-TPS	
	Medium Voltage Thyristor Power Systems up to 4.16kV	15
4.	HRVS-TX	
	Medium Voltage Inrush Current Limiter up to 100MVA, 36kV	16
Prot	ection Relays	
1.	MPS-3000	
	Motor Protection Relay	17
2.	MPS-6	
	Motor Protection Relay	18
3.	TPR-6	
	Temperature Protection Relay	19
4.	MIP-6	
	Motor Insulation Protection Relay	20
	chgear	
Pr	oGear Type Tested Switchgear Cabinet	21

# MEDIUM VOLTAGE SOFT STARTERS

# **HRVS-DN PowerStart**

DLCON

Digital, Heavy Duty, Medium Voltage Soft Starter 2.3-13.8kV, up to 48MW

The HRVS-DN is a heavy duty Medium Voltage Soft Starter, designed for all Medium Voltage AC induction motors. The HRVS-DN's advanced motor control technology ensures smooth acceleration and deceleration as it minimizes the effect of high in-rush current and mechanical torque shock. Advanced features include customizable starting curves, unique voltage and current measurements, as well as monitoring capabilities. The flexible design, enhanced motor

protection and a superior global reputation make the HRVS-DN the starting solution of choice for Medium Voltage applications - even under the most demanding conditions.

The HRVS-DN's flexible configuration is designed to meet the requirements of new applications, retrofits and OEM customization. It is available with Marine approvals and with ProGear, Solcon's fully Type Tested Arc Resistant switchgear.



## Advanced Features

- Configurable starting & stopping characteristics
- Enhanced motor protection package
- User friendly setup and operation
- Multi-soft start and multi-soft stop
- Unique synchronous motor starting module
- Pump and load control
- Advanced Electronic Current & Potential Transformer (ECPT) utilizes fiber optics for complete isolation between Low and Medium Voltage sections
- Partial Discharge test according to EN50178/625.1
- Direct Power Factor Capacitor connection

## Integral Protections

- Bypass open
- Under Voltage
- Under current
- Current unbalance
- Phase sequence
- Maximum start time
- Electronic overload
- Instantaneous over current 100-850%
- Time over current

- 45-65Hz Auto-tracking frequency range
- Easy to conduct Low Voltage test
- EMC compliant design and tested
- Communication :Modbus / Profibus / DeviceNet / Anybus
- Compact 2-phase control configuration (optional)
- Event recorder logs 99 events and includes real-time clock
- Connex Data Logger (optional) For remote monitoring
- Multi-language interface

- Over Voltage
- Number of starts
- Under/over frequency
- External fault
- Power ON no start
- Thermal modeling
- Phase loss
- Shorted SCR
- Over load class trip





# Control Panel (MVCP)

- Single range power supply (110V/220 VAC, 50/60Hz, AC/DC
- Modular design Simple Plug and Play slots for multiple option card installation
- Wide variety of communication options including Anybus HMI module
- Large HMI Interface LCD, 4x16 format

Option to install HMI on MV Cabinet door or remote site (up to 25 meters)

- Quad adjust 4 starting configuration settings
- Multi-language support including Russian and Chinese
- Data Logger Option remote maintenance and diagnostics Integrated data logger and waveform capture PC software (C-Plot) available for system support
- Advanced 99 event log recorder
- Multi-Start controller
- Available as upgrade for an existing HRVS-DN installation

Mains Voltage	Rated Current	Motor kW	Mains Voltage	Rated Current	Motor kW	Mains Voltage	Starter Current	Motor kW		Mains Voltage	Starter Current	Motor kW
(kV)	(A)	(kW)	(kV)	(A)	(kW)	(kV)	(A)	(kW)		(kV)	(A)	(kW)
	60	200		60	360		70	1,020			70	1,100
	110	360		110	660		140	2,040			140	2,200
	200	660		200	1,200		250	3,650			250	4,000
	320	1,060		320	1,930		300	4,300			300	4,800
2.2	400	1,330	116	400	2,410		400	5,800			400	6,400
2.3	500	1,660	4.16	500	3,010		500	7,250			500	8,000
	600	2,000		600	3,610	10	600	8,700		11	600	9,600
	700	2,300		700	4,210	10	700	10,150		11	700	11,200
	800	2,660		800	4,820		800	11,600			800	12,800
	1,000	3,330		1,000	6,030		1,000	14,500			1,000	16,000
	60	280		70	670		1,200	17,400			1,200	19,200
	110	520		140	1,340		1,400	22,000			1,400	22,400
	200	950		250	2,390		1,600	25,000	1,600	25,600		
	320	1,530		300	2,870		1,800	28,000			1,800	28,800
2.2	400	1,910		400	3,820						70	1,400
3.3	500	2,390		500	4,780						140	2,800
	600	2,850	6.6	600	5,736						250	5,000
	700	3,325	0.0	700	6,740						300	6,000
	800	3,820		800	7,650						400	8,000
	1,000	4,780		1,000	9,570						500	10,000
				1,200	11,500					13.8	600	12,000
				1,400	14,000						700	14,000
				1,600	16,000						800	16,000
				1,800	18,000						1,000	20,000
											1,200	24,000
											1,000	20,000
											1,200	24,000
How	To Ord	er				 						

## Models | 2.3-13.8kV, 60-1,800A

Example: <b>HRVS-DN</b>	- 1000A -	3.3kV	- 230V	- 230V -	3P	
	Rated Current	<b>∀</b> Mains Voltage	▼ Control Voltage	Control Input Voltage	<b>♦</b> Optio	ons
			115VAC, 230VAC 125VDC, 220VDC	115VAC, 230VAC 110VDC, 125VDC 220VDC	3M - 3P - 3D - 3A - 4 -	Moc Prof Devi Anyl Insu

Modbus

- Profibus DeviceNet
- Anybus
- Insulation test
- Analog output
- M -Marine standard
- MSS Multi motor soft-start/stop
- SDL -Solcon Data Logger
  - UL & CUL standard

### DriveStart | IGBT BASED MEDIUM VOLTAGE SOFT STARTER UP TO 11KV, up to 18MVA (depending on load, higher ratings available)

# The first of its kind IGBT based Medium Voltage Soft Starter

Optimized for applications that require a low starting current and/or a high starting torque

Provides full torque start

DLCON

- Starts at nominal motor current or lower
- Enables motor starting from weak electrical networks
- Reduces motor heat at start enabling use of standard motors
- Reduces peak network demand

# Technical Specifications

- Input voltage Up to 11kV 50/60Hz +10% -15
- Power range Up to 11kV, 8.5MVA
  \*For higher power requirements consult with us
- Mains starting current 10% to 120% of motor rated current
- Starting torque Up to 160% of motor rated torque
- Internal synchronization system (bypass), from DriveStart to mains and back

# Blue Box Control Technology



- Full control and monitoring of the system
- IEC, UL and cUL conformed
- Full graphic HMI 10" colour screen
- Easy set-up from touch screen
- Wireless connection for data transfer

- Saving costs, energy while meeting top performance requirements
- Integrated bypass protects against energy loss during operation, optimizes energy efficiency and reduces operational costs
- Streamlined design drastically reduces the footprint requirements
- Soft Start and Soft Stop
- Multi-start capabilities
- Integrated Data Logger and wave form capture for all major system signals including current and voltage for remote diagnostics and failure analysis

Pre-Programmed- ManyScenarios

- Single motor start
- Multi motor start
- DriveStart<sup>2</sup> and Soft starter combinations
- Full redundancy of DriveStart<sup>2</sup>
- Double bushbar solutions

# Connectivity

- 3 serial ports (RS-232C/422/485)
- SD card
- USB Type A+B
- Ethernet (LAN)
- Connex Data Logger & Spectrum analyser





## Models UP TO 11kV & 18.5MVA - Inverter Section Only

kV	Rated Capacity	Rated Current	Unit	Dimensions	(mm)	Weigh	t (kg)
KV -	kVA	А	Н	W	D	Min'	Max'
	550 - 1000	93 - 178	2,495	2900	1100	4,500	5000
0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	1,300 - 1,750	228 - 312	2,495	3,500	1300	6,250	6,800
~ ~ ~	2,200 - 2,500	385 - 440	2,595	4,200	1,300	8,000	8,400
3.3	2,850	500	2,570	4,700	1,400	9,60	00
Image: constraint of the second sec	3,600 - 3,850	635 - 675	3,110	6,900	1,600	11,3	00
0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	5,200 - 5,500	914 - 962	3,110	7,400	1,700	13,500	13,700
	700-1,250	97 - 178	2,460	2,600	1,900	3,800	4,600
4.16	1,650-2,250	229 - 312	3,064	4,500	1,400	7,600	7,900
	2,750-3,200	382 - 440	3,064	5,400	1,500	10,000	10,200
	500 - 1,100	44 - 93	2,460	2,500	1,600	2,950	3,700
a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a	1,200 - 2,000	105 - 178	2,460	2,600	1,900	3,800	4,600
0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	2,250 - 3,600	197 - 312	3,064	4,800	1,400	7,100	8,000
6.6	4,000 - 5,100	350 - 440	3,064	6,200	1,500	10,100	10,300
0      0        0      0        0      0        0      0        0      0        0      0	5,400 - 5,700	472 - 500	3,064	6,800	1,500	11,700	11,800
a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a        a      a	6,400 - 7,700	560 - 675	3,164	7,400	1,600	14,950	16,950
0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	8,250 - 11,000	722 - 962	3,164	11,100	1,600	22,500	25,500
	500 - 1,600	29 - 93	2,460	3,400	1,700	3,700	5,000
	1,700 -3,080	98 - 178	2,783	5,400	1,300	6,000	7,150
	3,350 - 4,600	193 - 266	3,064	7,100	1,500	9,900	11,800
10	5,000 - 5,400	289 - 312	3,064	7,300	1,500	11,900	13,000
10	5,850 - 6,600	338 - 381	3,064	8,300	1,500	13,050	14,200
	7,000 - 8,700	404 - 500	3,064	11,400	1,500	19,650	20,400
	10,500 - 11,700	606 - 675	3,119	12,500	1,500	21,400	22,400
	13,500 - 16,500	779 - 962	3,239	14,100	1,600	25,800	28,800
	625 - 1,750	33 - 93	2,460	3,700	1,700	4,100	5,400
u      B)        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	1,850 - 3,400	97 - 178	2,873	6,600	1,500	8,100	9,500
m      de        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	3,750 - 6,000	197 - 312	3,064	8,100	1,500	11,400	14,000
11	6,600 - 8,400	346 - 440	3,064	11,800	1,500	21,100	21,700
u      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	8,700 - 9,500	457 - 500	3,064	13,000	1,500	22,300	22,400
u      di        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0        0      0	11,500 - 12,800	604 - 675	3,170	15,700	1,600	29,000	30,000
	15,000 - 18,300	787 - 962	3,290	16,700	1,700	35,500	37,500

\* For reference purposes only.\* Contact us for more information about a best matched solution for your requirements.

## DRIVESTART<sup>2</sup> IS CERTIFIED ACCORDING TO IEC 61800

Saving Costs, Energy & Space while meeting top performance requirements

# LOW VOLTAGE PRODUCTS

OLCON

*iStart* Advanced Low Voltage Soft Starter 17-1100A, 208-690V

## YOUR COMPREHENSIVE SOFT STARTING SOLUTION EASY TO COMMISSION, SIMPLE TO OPERATE

The iStart is Solcon's most advanced soft starter, with built-in bypass and 2 or 3-phase control. It incorporates enhanced soft-start and soft-stop characteristics, to provide the best solution for a wide range of applications.

The comprehensive motor protection package that guarantees long term reliability while the built-in bypass ensures excellent performance, all in a small versatile design.



iStart size A, B

## Advanced Features

- Universal Interchangeable Control Module
- Multi-language user interface
- Real-time, online, 99 event and trip log (including currents, voltages)
- Optimized for high efficiency motors (IE3)
- 2-phase mode for on-site phase fault operation
- Basic, professional and expert set-up menus
- User defined metering and monitoring of 3-phase voltages, 3-phase currents and power factor
- USB interface for setup and software updates
- Option cards include Analogue Output Including Thermistor, three Thermal Sensors, Motor Insulation Monitor
- Auto reset for selected faults

# Comprehensive Protection Package

- Under voltage
- Phase sequence
- Sheer-pin current
- Under current
- Overload classes (IEC, NEMA)
- Current imbalance
- Ground fault

- Excessive number of starts
- Excessive starting time
- Soft starter over temperature
- Programmable external fault
- Phase loss
- Inside delta wrong connection alarm

- 3 Thermistor inputs
- Frequency auto tracking 45-65 Hz
- Inline and inside delta connection
- AC/DC (Sizes A, B, C)
- 3 Current transformers
- Economical 2-phase units available

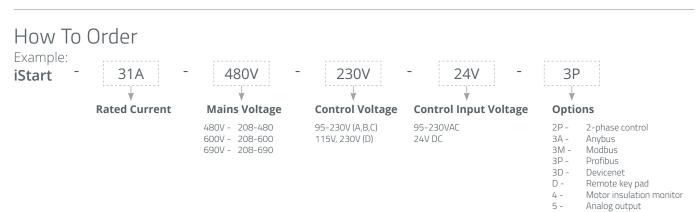
## Soft Start & Soft Stop Functions

- Acceleration control
- Current limit start
- 6 adjustable curves for pumps, generators, standard and torque controlled applications
- Soft stop
- Kick start
- Restart delay (3 sec)



# Models | 17-1100 A, 208-690 V, 2 or 3-phase with internal bypass

Model	el Rated Current Unit Dimensions (mm) (A) H W D			Weight (kg)	Internal Bypass	2 or 3-Phase Control	
	17						
٨	31	245	122	4.47			
А	44	245	122	147	3.2	+	+
	61						
	72						
В	85	275	132	208	5.2	+	+
	95						
	105	388		234			
C	145		175		10.9	+	+
C	170	300		201	10.5		
	220						
_	230		365	275		+	
D	310	555			37		+
	350						
E	430	644	365	285	38	+	+
6	515		10.0				
G	590	791	480	302	56	+	+
   	690						
Н	720	791	510	305	60	+	+
	850						
	960	815	559	316	85	+	+
1	1100						



3xRTD thermal sensor

Conformal coating

6 -8 -

# SOLCON

# **RVS-DN**

### Heavy Duty, Low Voltage Soft Starter 8-3000A, 220-1,200V

The RVS-DN is a heavy duty, advanced Soft Starter with over 25 years of reliability. Designed to operate under severe conditions for the start of motors in the most demanding applications, such as those in Marine and Mining installations. Advanced features such as pump control, slow speed, electronic reverse and enhanced motor protection make it one of the best and most popular soft starters in the industry.

## Advanced Features

- Robust construction
- Highly advanced starting & stopping characteristics
- User friendly set up and operation
- Line or Inside delta connection models up to 690V
- Ambient operating temperature: up to 60°C
- Motor insulation tester
- Communication: Modbus, Profibus, DeviceNet
- Thermistor input
- Analog output
- 45-65Hz Auto-tracking frequency range
- Can be operated without bypass contactor at 50°C up to 820A
- Designed to meet Marine Industry standards up to 3000A



# Comprehensive Protection Package

- Too many starts & start inhibit time
- Long start time (Stall protection)
- Shear pin (jam) with adjustable delay
- Electronic overload with selectable curves
- Under current
- Phase loss
- Phase sequence and Under/Over frequency
- Under/Over voltage
- Load loss (motor not connected)
- External fault
- Shorted SCR
- Starter over temperature protection
- Motor insulation test (option)
- Motor thermistor (option)
- When using "Preparation for Bypass" all protection remains active

## Soft Start and Soft Stop Functions

- Soft start and soft stop
- Soft, stepless acceleration & deceleration
- Current limiting
- Torque & current control for optimized acceleration and deceleration
- Pump control program
- Dual adjustment two start/stop characteristics
- Slow speed with electronic reverse
- Pulse start

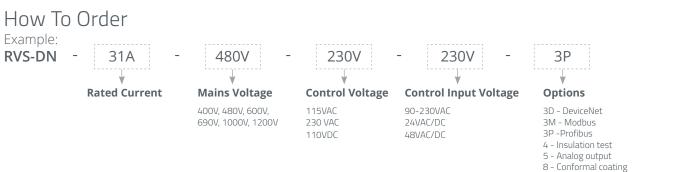
## Models | 8-3000A, 220-690V

Model	Rated Current	Motor kW	Unit Di	imension	s (mm)	Weight (kg)	
Model	(A)	@400V	Н	W	D	vveigiit (kg)	
	8	4				4.5	
	17	7.5				4.0	
А	31	15		153	170	6.0	
A	44	22	510	100	170		
	58	30				7.5	
	72	37					
	85	45					
В	105	55	385	274	238	14.5	
D	145	75	505			14.5	
	170	90					
	210*	110					
С	310*	160	455	380	292	32	
	390*	200					
	460*	250	455	380	292	39	
D	580	315	640	470	302	48	
D	820	450	710	470	302	65	
	950	560	660	623	290	83.5	
	1,100	630	1,100	723	370	170	
E	1,400	800					
	1,800	950	1,300	750	392	240	
F	2,150	1,250					
	2,400	1,400					
G	2,700	1,575	1,300	900	410	350	
	3,000	1,750					

\* Dimensions differ with Marine approvals.

#### 105-580A, 1,000-1,200V Models

	Model	Rated Current (A)	Unit Di	imension	Woight (kg)	
	Model	Raleu Curreni (A)	Н	W	D	Weight (kg)
	Н	105	400	325	300	20
1		170				55
		210	500	592	345	
ł		310				
		390				60
Ì		460				00
	J	580	650	650	400	85



- 9 Preparation for bypass contactor
- D Remote display
- M Marine approval (A-C) U UL standard (A-C)

# **SOLCON**

# **RVS-AxO**

### Compact, Low Voltage Soft Starter 3-75A, 220-500V

The RVS-AXO provides a cost effective solution for small to medium size motors. This simply designed soft starter expands further the analogue capabilities of the reputable cornerstone of Solcon's soft starters.

Apart from its built-in motor protection, this soft starter eliminates the need for excess wiring and space making it a perfect replacement for Start-Delta and Auto-Transformer Type starters.

Featuring built-in Modbus communication protocol for remote monitoring, the RVS-AXO awards it's users a reduction of downtime for optimal productivity.



- Compact & Easy to Install
- Three-Phase Control
- Wide Range Control Voltage
- Modbus RTU Settings & Monitoring
- DIN Rail mounting (8-22A)
- Suitable for single phase motor
- Easy to use Analog Interface

### Features

- Built-in bypass
- Soft start & soft stop
- Start / Stop with voltage free contact
- End of acceleration contact
- Compact foot print
- DIN Rail mounting (8-22A)

# Control Voltage | 100V-240V

Model	Motor A	Unit Di	mension	s (mm)
woder	@400V / 500V	Н	W	D
А	1.5 2.2 3.7 5.5	175	92	95
В	7.5 11	200	108	105
C	15 18.5 22 30 37	222	125	132

# **Comprehensive Motor Protection**

- Opencurrent Protection
- Undercurrent Protection
- Current Imbalance Protection
- Phase Loss Protection
- Phase Sequence Protection
- Over Temperature Protection
- Internal Logic Fault Protection

## How to Order

Example: **RVS-AXO** 1.5A Load Current

400V Mains Voltage 400V, 500V

# **RVS-AX**

### Analog, Low Voltage Soft Starter 8-170A, 220-600V

The RVS-AX provides an optimal solution for small to medium size motors and is an ideal cost effective replacement for Star- Delta and Auto-Transformer type starters. It is easy to install and operate with built-in Current Limit and Motor Protection, integral bypass and 3-phase control. Control voltage is not required to operate the RVS-AX.

### Features

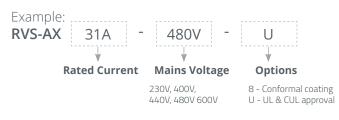
- Built-in motor protection
- Built-in bypass (31-170A)
- Soft start & soft stop
- Current limit
- Start / Stop with voltage free contact



## Models | 8-170A, 220-600V

Medel	Rated	Motor kW	Unit Di	mension	s (mm)	Weight
Model	Current (A)	@400V	Н	W	D	(kg)
А	8 17 31 44	4 8 15 22	232	120	105	2.6
В	58 72	25 37	275	129	185	5
С	85 105	45 55	380	120	185	8.4
D	145 170	75 90	380	172	195	11.8

## How to Order



# Solbrake

### DC Injection Brake 8-820A, 208-690V

The Solbrake electronic brake provides fast, smooth, frictionless braking of standard motors by injecting controlled DC current into the motor windings after the line contactor has opened. This DC current induces a stationary magnetic field which exerts a braking torque on the rotor.



## Advanced Features

- Reduces stopping time of high inertia loads increases production rate in machine tools and safety of hazardous machines
- Adjustable braking time
- Auto stop DC Injection stops when the motor stops
- DIN Rail mounting (Rated current 10A)
- Soft, smooth stopping, preventing wear and tear of mechanical parts
- Adjustable braking torque, matching load size and required stop time
- Auto stop, reducing motor heating

## Models | 8-820A, 208-690V

	Rated	Motor kW	Unit Di	ns (mm)	Weight	
Model	Current (A)	@400V	Н	W	D	(kg)
Α	10	5	75	45	105	0.7
	17	7.5	190			
В	31	15		65	114	1.4
	58	30				
C	105	55	280	154	160	5.2
C	210	90	200		100	5.7
	310	110				
D	390	160	384	224	222	12
	460	220				
Е	820	470	384	224	222	13.2

# **Thyristor Power System** TPS

8-1500A, 230-1200V

The TPS is a heavy duty 3-phase power unit for controlling the voltage applied to either inductive or resistive heating elements. It is a heavy duty, digital, zero crossing and phase control power system.

#### Models Up to 690VAC

Model	Rated Current	Load kW	Unit Di	imension	s (mm)	Weight (Kg)
woder	(A)	@400V	Н	VV	D	weight (Kg)
	8	6				6.3
	17	12				6.3
А	31	21	291	172	185	6.4
A	44	30	291	172	105	6.5
	58	40				6.5
	72	50				6.5
D	85	59	390	172	195	8.5
В	105	73	390	172	195	0.0
	145	100		274		
С	170	118	385		238	14.5
	210	145				
D	310	215	455	380	292	31
D	390	270	455	360	292	51
E	460	318	555	380	292	51
F	580	401	640	470	302	53
F	820	567	640	470	302	53
	950	657		Con		
C	1100	761		Cons	sult Factory	
G	1400	969	1225	1050	471	172
	1500	1038	1225	1050	4/1	172

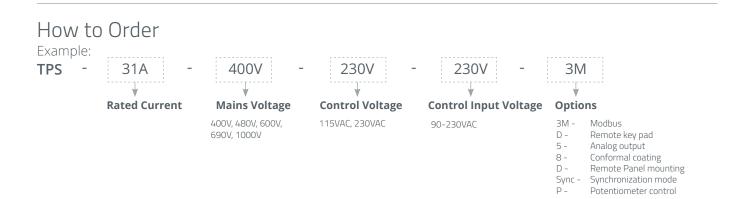


# Advanced Features

- Range: 8-1500A, 230-1200V, 50/60Hz
- Zero crossing & phase control (field programmable)
- Comprehensive protection package
- Communication: Modbus
- Line and Inside delta connection
- Synchronized mode (up to 10 units)

# Models | 1200VAC

Rated Current		Motor kW	Unit Di	mension	Moight (kg)	
	(A)	@1000V	Н	W	D	Weight (kg)
	55	95	550	280	346	22 E
	200	346	000	200	540	د.دد



# MV-TPS | Medium Voltage Thyristor Power System Up to 14.16kV, 500A

### Medium Voltage Heater Controller

The MV-TPS is a heavy duty, fully digital, zero-crossing, phase-control, 3-phase control power unit for all types of resistive loads.

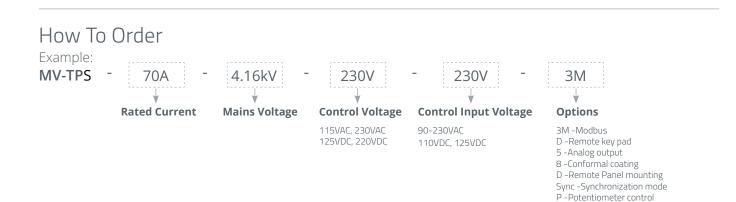
The MV-TPS is intended for voltage control of Medium Voltage heating applications. Using Medium Voltage drastically reduces the amount of cable required, the size of the heating elements, the size of the electrical equipment cabinets and saves costly step-down transformers and switchgear versus a Low Voltage system.

## Advanced Features

- Fully programmable, 15 protection functions
- Load unbalance alarm to detect a faulty element, even in a parallel connected element system
- Under power level alarm to detect faulty element in case the system is designed to work unbalanced
- Two-line, 16 character LCD screen displays actual values, statistical & maintenance data

# Models | Up to 13.8kV, 500A

	Rated Current	Heater	Unit Di	mension	ıs (mm)
Mains Voltage (kV)	(A)	kW @6.6kV	Н	W	D
	70		1		
4.16	140	2000	1,573	1,032	685
	300				



Patent pending





# HRVS-TX

Medium Voltage Inrush Current Limiter Up to 100MVA, 36kV

The HRVS-TX eliminates transformer inrush current for all types of Medium Voltage Transformers, up to 100 MVA at 36kV. It is the ideal current limiting solution for Medium Voltage Transformers. Its sophisticated control ensures the elimination of the magnetizing inrush current, eliminating nuisance tripping as well as dynamic shock to the transformer windings. The current limiter can be supplied as IP31-54 with options such as Line and Bypass vacuum contactors and optional circuit breakers, disconnect switches, main and control protection fuses and transformer protection relays.

## Advanced Features

- Integral Current Limiting Relay (TSR-6)
- Heavy duty design
- Ambient operating temperature -10°C to 50°C
- Reduced inrush current and dynamic shock
- Applicable models for any transformer
- Communication RS485 Modbus
- Unique starting characteristics
- Fault indication to each individual fuse

- Partial Discharge (Korona) test for each transformer starter
- Wide 40-70Hz range for fluctuating frequency systems
- IP31-standard, Higher standard available
- User friendly, easy setup and operation
- Electronic Potential Transformer (optional)
- Extended protection package (optional)
- Transformer temperature protection relay (optional)

# Models | Up to 36kV, 100MVA

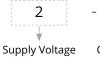
Mains	Max	Max	Unit Di	imensior	ns (cm)
Voltage (kV)	Current (A)	Power (kVA)	Н	W	D
3.3	600	3,400			
5.5	1,200	6,900			
4.16	600	4,300	230	180	110
4.10	1,200	8,600	230	160	TIU
6.6	600	6,900			
0.0	1,200	13,700			
	600	11,400			
11	1,200	22,900	230	210	110
	1,600	30,500			

Mains	Max	Max	Unit D	imensior	ns (cm)
Voltage (kV)	Current (A)	Power (kVA)	Н	W	D
	600	14,300		1	
13.8	1,200	28,700	230	250	110
	1,600	38,200			
	600	22,900			
22	1,200	45,700	240	330	120
	1,600	61,000			
36	1,200	74,800	250	450	120
50	1,600	99,800	230	430	120

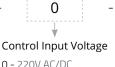
## How To Order

Example:





**2 -** 110-230V



0 - 220V AC/DC 1 - 110VAC



**3R -** 3 RTD (Pt100)





# **PROTECTION & CONTROL RELAYS**

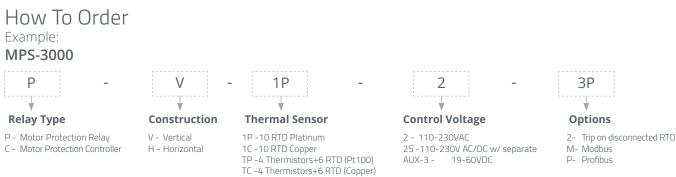
### **MPS 3000** Motor Protection and Control Relay

The MPS-3000 provides a comprehensive motor protection and control package. Monitoring 3-phase currents and voltage together with 10 RTD/Thermistor temperature inputs it provides an ideal solution for Medium and Large Low Voltage Motors.



### Advanced Features

- Monitoring 3 temperature inputs, 3-phase current, voltage and energy
- Power measurement (3-phase voltage measurement)
- Statistical data of last 10 trips, with time and date stamp
- RTD bias for thermal overload
- Multiple Thermal Overload curves
- Too Many Starts pre-alarm, configurable to energize dedicated output relay
- Capture and display of min and max RMS, average of 3-phase current, one voltage, min and max frequency
- Ground Fault setting during start eliminates nuisance trips
- MODBUS communication, remote parameter programming, control and supervision.
- Programmable discrete inputs/output
- 4 programmable analog outputs



P- Profibus

# **Comprehensive Protection Package**

ANSI/IEEE C37.2	PROTECTIONS	MPS 3000	MPS-6
3	Communication failure / Internal failure		$\checkmark$
27	Under-voltage		$\checkmark$
32L	Under Power Level 1/2		$\checkmark$
37	Under current Level 1/2		
46	Current Imbalance Level 1/2		$\checkmark$
47	Phase sequence/loss		-
48	Max. Start Time		$\checkmark$
49R	High Temp. Level 1/2, sensors 1-10		
49/51	Thermal Capacity Level 1/2		$\checkmark$

ANSI/IEEE C37.2	PROTECTIONS	MPS 3000	MPS-6
50	Over Current Level 2 - Short		$\checkmark$
50G	Ground Fault Level during starting		$\checkmark$
50G/N	Ground Fault Level 1/2		
51L	Load Increase - Alarm		$\checkmark$
51R	Over Current Level 1 - Jam		
55	Lead / Lag PF / Low Power Factor		$\checkmark$
59	Over-voltage Level 1/2		$\checkmark$
66	Too Many Starts Level 1		-
74	Welded contactor (MPS 3000c)	-	



# MPS-6 Motor Protection System

The MPS-6 is a Motor Protection System that offers protection, control and supervision for Low Voltage high power motors and is also suitable for motors operating in a Motor Control Center (MCC).

### Advanced Features

- Monitoring 3-phase currents, single phase voltage and 3 temperature inputs
- Power measurement
  (single phase voltage measurement)
- Statistical data of last 10 trips with time and date stamp
- RTD Bias for thermal overload
- Multiple Thermal Overload curves
- Too Many Starts pre-alarm, configurable to energize dedicated output relay
- No Start Process starting method, allowing switching to run, if I > 10%
- Capture and display of min and max RMS average of 3-phase current, one voltage, min and max frequency
- Ground Fault setting during start elimination nuisance trip
- MODBUS communication (up to 19200 bps) remote parameter programming, control and supervision
- 6 programmable discrete inputs and outputs

## How To Order

# Example: **MPS-6**



C/T Secondary



**Control Vo** 2 - 100-230V

-	1	
· )		
_		
•		
ontrol	Voltago	
UTILIUI	Voltage	
	0	

3T Thermal Sensor 3R - 3 RTDs (Pt100) 3T - 3 Thermistors



### Models MPS-3000

Model	Unit I	Moight (kg)		
woder	Н	W	D	Weight (kg)
Vertical	310	134	140	2.1
Horizon	140	310	134	5.1

#### MPS-6

Madal	Unit I	Maight (kg)		
Model	Н	W	D	Weight (kg)
MPS-6	144	96	107	1.5

#### **TPR-6** Temperature Protection Relay

The TPR-6 Temperature Protection Relay is designed to protect electric motors, transformers and other systems from overheating. The TPR-6 has up to 14 temperature inputs that can be programmed to measure thermistors (PTC or NTC) and RTDs (Pt100).

## Advanced Features

- Advanced microprocessor based circuitry
- Display of operating RTD or Thermistor Data, Fault and Statistics
- Programmable inputs and outputs
- RS-485 communication with MODBUS protocol
- Easy installation and friendly operation
- Two level protection for Alarm and Trip
- Selection between Trip and Trip fail-safe
- Analog output related to any input or input combinations
- RTD / Thermistor selection RTDs 100 ohm Platinum (PT100) -Thermistor - PTC or NTC
- Disconnected sensor protection

### **Protection Features**

- RTD / Thermistor with two levels for each input
- Thermistor PTC / NTC selection
- Over temperature Alarm and Trip to each input
- Continuous analog output signal
- External fault 1 and 2

## Protection Functions

- Exact input can be assigned to any of the following items:
- Alarm only Relay A
- Trip only Relay B
- Fan (Trip, Alarm)- Relay C
- Trip/Alarm- Relay D

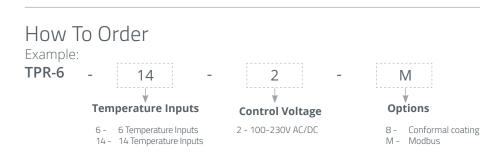
Μ

Options

Enabling Auto Reset

## Models

Model	Unit Di	mension	s (mm)	Maight (kg)
woder	Н	W	D	Weight (kg)
TPR-6	144	96	107	0.8





# MIP-6

### Motor Insulation Protection Relay Low/Medium Voltage Motors

The MIP-6 monitors the level of deterioration in the insulation of Low and Medium Voltage Motors. It measures the motor's insulation resistance and displays the actual and average highs and lows over a predefined period of time, inaddition to showing predictive alerts.

### Two types of units available:

- Low Voltage
- Medium Voltage with an additional resistor box (up to 15kV Medium Voltage motors)



- Monitors insulation deterioration of Low / Medium Voltage motors
- Displays the present and average insulation resistance on LCD
- Monitoring while motors are de-energized
- Programmable parameters
- Microprocessor based technology
- Alarm / Trip Setpoint in the range of 0.1 to 60 Mega Ohms
- Utilizes up to 48 VDC test voltage to increase personnel safety
- Illuminated LCD display with 2 lines of 16 characters each
- Six keys for easy programming
- Three LEDs for easy status indication
- Deterioration monitoring by storing history with time stamp
- Unauthorized parameter modification prevention
- Four C/O 8 Amp., 250V programmable signaling relays
- Analog 0/4-20mA output for remote reading
- Modbus communication
- Control Voltage: 85-230VDC/AC (50/60Hz)
- Operating Temperature Range 0°C to +50°C (default all units) -10°C to +60°C (optional)

## Models

Model	Unit Di	imension	s (mm)	Woight (kg)
Iviodei	Н	W	D	Weight (kg)
MIP-6	144	96	107	0.5

How	То	Order
Example	2:	





LV -230-690VAC MV1 -690-7200VAC MV2 -7200-13800VAC



5 -Analog output 8 -Conformal coating M -Modbus



# **ProGear** Switchgear Cabinet



The Progear Switchgear is a fully type tested Metal Enclosed switchgear cabinet; offering numerous designs as standard modular design blocks.

Designed and Built according to IEC standards, Progear can be tailored according to Customer requirements. Cabinets can be fitted with a soft starter, protection apparatuses and control products in addition to our newly developed Connex, a holistic solution for diagnostics and maintenance of the complete system.

## Modular Design

Option for Multi Motor Start, Control and Protection

## Separated Internal Compartments

For Complete Isolation of Low and Medium Voltage Compartments

# Safety Locks

The doors are built with locks and handles that are designed to prevent accidental opening

# Hinged Door Panels

Ideal for accessing wires and apparatus

# Complete Flexible Design

For choice of switchgear apparatus Solcon's Progear is compatible with all switchgear apparatus suppliers



# IEC 62271-200 TYPE TESTED & CERTIFIED

- Internal arc protection
- IP54 ingress protection rating According to IEC standards
- Shock & vibration proof
  According to iec standards
- 9 Point seismic certification
  According to IEC standards



Solcon Industries is a dynamic, high-tech power electronics company that remains at the forefront of design, development and manufacturing of industrial motor starting and control systems.

Solcon offers a complete range of Low and Medium Voltage Soft Starters for a wide range of standard and heavy duty applications. Solcon also manufactures industry-leading Motor Protection Relays and Control Products.

Solcon deploys advanced technology and field research to implement the highest quality criteria, guaranteeing long-term reliability to our customers. We take pride in providing custom solutions for the toughest applications including the Mining, Marine, Water, and Oil & Gas Industries. Solcon's consistent investment in research and development, along with a strong global partner network and worldwide customer base, are the keys to our success.

A deep understanding of the market needs and application requirements have enabled Solcon to upgrade existing product lines and introduce new, innovative solutions to the market making us a market leader.

Solcon is accredited with ISO 9001:2000. Our products are designed to meet international standards such as CE, UL, cUL, Ex, EAC, Lloyds, Germanischer Lloyds, DNV, BV, ABS, RINA, KR, NK-Class, RMRS, CCS and other approvals are also available.

## Certifications & Standards



## Meeting your needs across industries



