

HRVS-DN

Medium Voltage Digital Soft Starter 30-1000A 1500-13800V



For Every New Beginning
You Need A Good Start



SOLCON

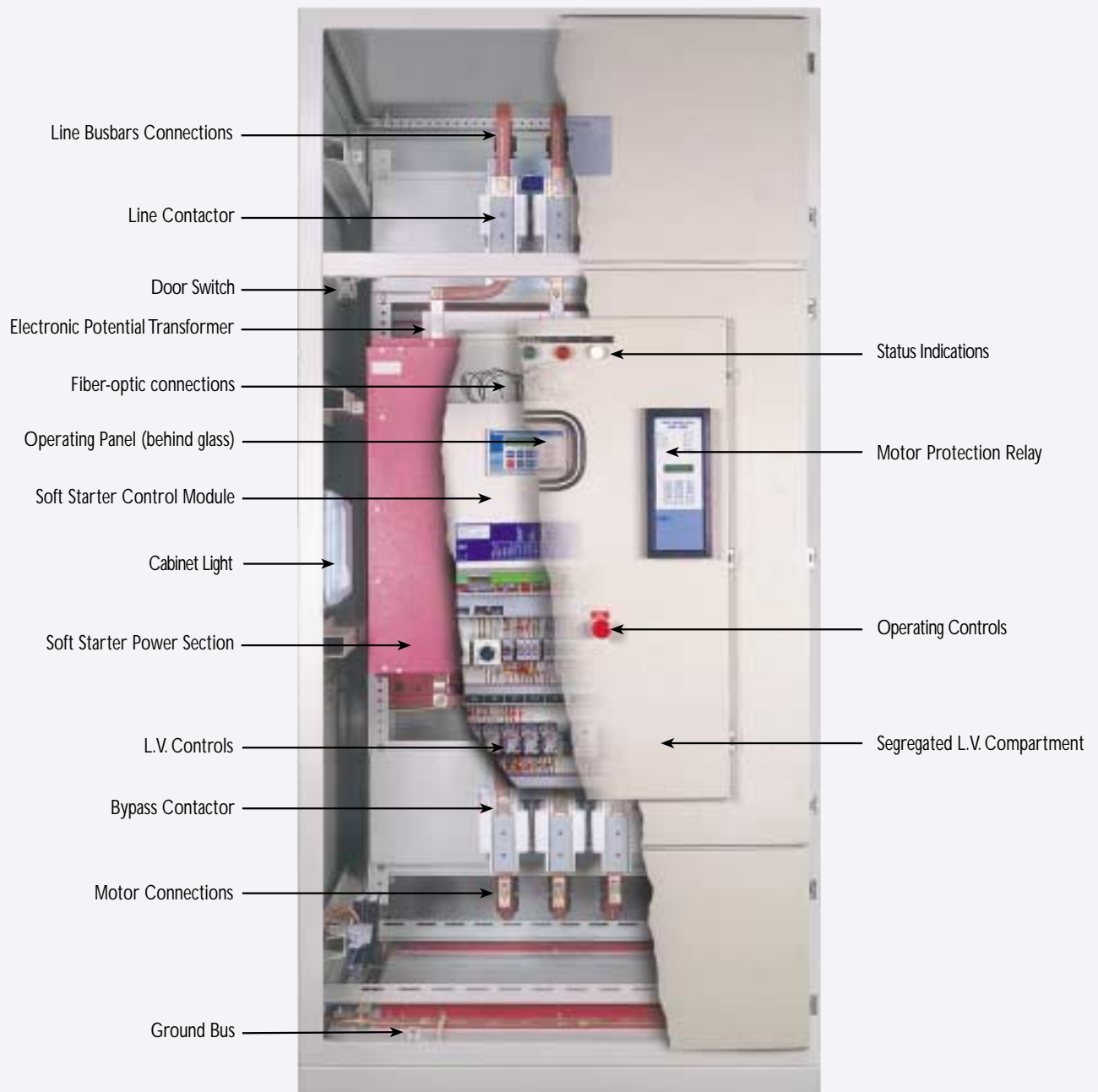
HRVS-DN

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General

This third generation, fiber optic controlled, Medium Voltage soft starter is designed for use with standard asynchronous and synchronous motors.

The HRVS-DN is a highly sophisticated digital soft starter which ensures smooth, stepless acceleration and deceleration, eliminating current and mechanical shocks on motor and load. The HRVS-DN may be supplied as a chassis or enclosed type with a multiple range of options.



Features

Advantages at a Glance

- Heavy duty design at 50°C ambient temperature
- Reduced inrush current and mechanical shock
- Third generation microprocessor circuitry
- Soft, stepless acceleration & deceleration
- Unique starting & stopping characteristics
- Sophisticated motor protection package
- User friendly, easy setting and operation
- IP32-standard, higher protection by special order
- Synchronous motor starting, utilizing unique module
- Innovative low voltage test mode - full testing with a small L.V motor using standard built in features
- Advanced Electronic Potential Transformer utilizing Patent Pending "wireless" voltage measurement system
- Unique, Patent Pending fiber-optic firing system providing complete isolation between MV and LV compartments.
- Unique fault indication to the individual thyristor level
- Each starter is tested for Partial Discharge (Korona) improving safety and ensuring long term reliability
- Power factor capacitors can be connected directly to the upstream contactor (omitting the need for capacitor contactor)
- Two optional methods of delivery: Chassis type for self assembly or Complete system
- RS485 Communication with MODBUS, PROFIBUS or MODBUS/TCP protocols (others - upon request)
- Wide 45-65Hz Auto-tracking frequency range combining special software with unique hardware arrangement (designed for Marine, Offshore and Generators operating under continuous frequency variation)

Motor & Starter Protection

- Too many starts & start inhibit time
- Long start time (Stall protection)
- Electronic overload with selectable curves
- Electronic shear-pin
- Undercurrent
- Unbalanced current
- Ground fault current
- Phase loss
- Phase sequence and under/over frequency
- Undervoltage
- Overvoltage
- External faults (2 separate inputs)
- Shorted SCR & Wrong Connection
- Starter over temperature
- Power on without start signal
- Open Bypass contactor

Starting & Stopping

- Soft start and soft stop
- Current limit
- Pump Control characteristics
- Torque and Current Control for optimized Starting & Stopping process
- Dual Adjust - 2 start/stop characteristics for varying loads and two speed motors
- Pulse start (kick start)
- Tacho/encoder feedback (option)

Interactive LCD Display

Four languages can be selected: English, French, German & Spanish



User friendly keypad allows accurate setting

LEDs - For easy operational status

Control Circuitry

- Multi-function programmable I/Os
- Opto-isolated control inputs
- Three Change Over output relays, 8A/250VAC
 - "Immediate" - upon Start
 - "End of Acceleration"
 - "Fault" programmable as Trip or Trip-Fail safe
- Analogue output 0/4-20mA, 0-10VDC
- Tacho incremental encoder feedback

Applications

Industrial

- Pumps
- Compressors and Chillers
- Fans, Blowers and centrifuges
- Conveyors, elevators and monorail systems
- Tachometer driven system
- Starting from weak power supply (diesel generators, long supply lines, etc)



Marine & Offshore

- Water & ballast pumps
- Refrigeration chillers & compressors
- Hydraulic pumps & power packs
- Thrusters
- Main Propulsion motors
- Unique protection for corrosive environments
- Generator ready - auto frequency tracking, sustains variations of 45-65Hz while starting



The HRVS-DN is Lloyds, DNV & ABS Tested

General Information

Dimensions

Starter Type Ampere	System Voltage	Motor Rating		IP 00 Dimensions (mm)			Wt. (Kg)	IP 32 - 65 Dimensions (mm)			Wt. (Kg)
		KW	HP	W	H	D		W	H	D	
HRVS-DN 60, 110, 200, 320, 400, 600, 800, 1000	2300	200-3400	270-4500	660-900	900	470-580	120-220	900-1100	2300	1000-1100	500-800
HRVS-DN 60, 110, 200, 320, 400, 600, 800, 1000	3300	300-4900	400-6500	660-900	900	470-580	130-250	900-1100	2300	1000-1100	500-800
HRVS-DN 60, 110, 200, 320, 400, 600, 800, 1000	4160	350-6200	500-8000	660-900	900-1000	470-580	140-250	900-1100	2300	1000-1100	650-800
HRVS-DN 60, 140, 250, 300, 400, 500, 600, 700, 800, 900, 1000	6000	500-8800	700-12000	900-1200	1030-1300	600-710	200-400	1100-1500	2300	1100-1200	700-800
HRVS-DN 60, 140, 250, 300, 400, 500, 600, 700, 800, 900, 1000	6600	550-9700	750-13000	900-1200	1030-1300	600-710	200-400	1100-1500	2300	1100-1200	700-800
HRVS-DN 60, 140, 250, 300, 400, 500, 600, 700, 800, 900, 1000	11000	950-16000	1300-21500	Consult Factory							
HRVS-DN 60, 140, 250, 300, 400, 500, 600, 700, 800, 900, 1000	13800	1200-21000	1600-28000	Consult Factory							

* For values below 30A and above 1000A please consult factory

* For soft starters above 5000KW please consult factory

Standard and Special Versions



Standard Version



Marine & Offshore



Multi-Motor application
with fan cooling system



Narrow 80cm (31") for
4160V with Load Make
Fault Break switch



Retrofit, 4.16KV,
existing bus-bars,
1600mm (63") Depth



Retrofit,
Dual Voltage,
2300-3300V,
1500mm (59")
Height

Switchgear Options

- Line Vacuum Contactor
- Bypass Vacuum Contactor
- Control Voltage: 110-220VAC, 110VDC
- Special thick paint
- MCT (Multi Cable Transit)
- Fan system - increased cooling
- Tin plated busbars
- Halogen free and fire retardant materials
- Main Switch (On-load or Off-load)
- Main Fuses (with/without striker-pin indication)
- Motor Protection Relay (MPR-2000 or MPC-2000)
- C/T's and P/T's
- Digital Power Meter (DPM-10)
- L.V. Control devices (selector switch, push buttons, indication lights, etc.)
- IP32 - IP65 or NEMA types are available



Medium Voltage MCC
formation with Load Make
Fault Break switches

Multi-Motor MCC
formation with
redundant supply



Unique Performance

Partial Discharge Design & Test (Korona)

The HRVS-DN withstands **EN 50178 part HD 625.1**. Each starter is fully tested for Partial Discharge (Korona) improving safety and long term reliability

Low Voltage Test

Innovative low voltage testing with a small 400V motor. This unique mode of operation allows for fully functional performance. Enabling Line and Bypass contactors operation as well as plant control system. (The procedure is field Initiated in minutes and includes active protection status with no need for any additional equipment.)



"Dry", No Voltage Testing

"Dry" testing allows thyristor firing test without mains voltage connection.

Wireless Electronic Potential Transformer (EPT)

Advanced Electronic Potential Transformer utilizing Patent Pending "wireless" voltage measurement system.



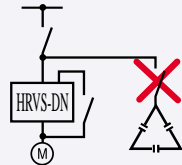
Saves: Space, Weight, Cabling, Engineering & Costs

Fiber-Optic Firing System

Unique, Patent Pending fiber-optic firing system providing complete isolation between MV and LV compartments.

Direct Power Factor Capacitor Connection

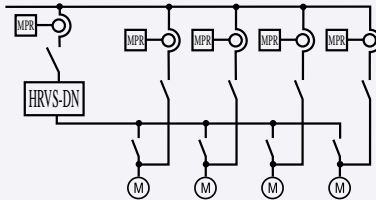
Power factor capacitors can be connected directly to the upstream contactor, omitting the need for additional contactor, provided stable mains (-15% + 10%) during starting.



Saves: Space, Weight, Cabling, Engineering & Costs

Multi - Motor Starting

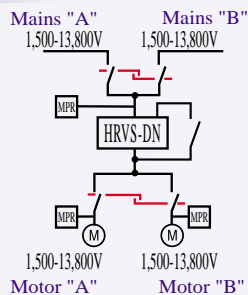
Unique Multi-Motor program allows for more than one motor to be started with the same soft starter.



Saves: Space, Weight, Cabling, Engineering & Costs

Multi-Voltage Starters

Unique Dual-Voltage connection allows for more than one voltage level to be used with the same soft starter.



Saves: Space, Weight, Cabling, Engineering & Costs

Starting from Diesel Generator

Wide 45-65Hz Auto-tracking frequency range combining special software with unique hardware arrangement (designed for Marine, Offshore and Generators operating under continuous frequency variation)



Individual Thyristor Fault Indication

Unique fault indication to the individual thyristor level

Synchronous Motors Starting

Highly sophisticated optional module allows for Synchronous motor starting.

OEM Chassis Kit or Complete System

IP 00: Chassis type Power and Control modules

IP 32-65: Complete turn key system (see list for available options).



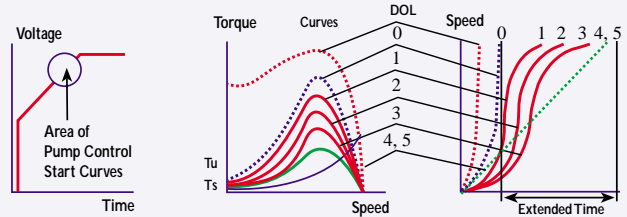
Pump and Special Load Control

Two major problems are associated with starting and stopping of pumps (see our "Pump Application" Guide).



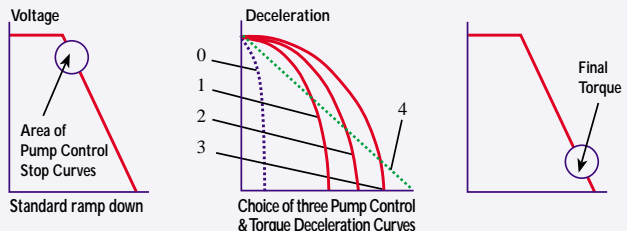
Over-Pressure During Starting

The sharp increase of torque towards the end of acceleration can cause high pressure and damage the pipe system. The Pump Control enables selection between three voltage ramp-up curves as well as torque curve to reduce peak torque. Current ramp is available for special loads.



Water Hammer During Stopping

During Soft Stop, when voltage is decreasing, motor torque may fall below load torque causing abrupt stalling instead of smoothly decreasing speed to zero. This creates the Water Hammer phenomenon (resulting in a loud noise and damage to the pipe system). The Pump Control feature enables selection between three voltage ramp-down curves or torque curve preventing stall condition and eliminating Water Hammer.



Additional Products

Additional catalogues available from Solcon's product range

RVS-DN

Low Voltage Digital Soft-Starter
8-2700A, 230-1000V



RVS-AX / RVS-DX

Analogue & Digital soft-starter



SOLSTART

Miniature soft-starter
For single & triple phase motors



RVS-BX / SEM-N

Basic electronic soft-starter
Basic electronic naval soft-starter



MPR 2000 / MPC 2000

Motor Protection Relay
Motor Protection Controller



MPR 6

Motor Protection Relay

TPR 6

Temperature Protection Relay



HIU

Restart Relay



SMB

DC Injection brake



DPM 10

Digital Power Meter



PFC 10

Reactive Power Factor Controller



SU 124

Generator Control & Protection



DGC 2000

Digital Generator Control & Protection



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