JAYASHREE
ELECTRON
[AN ISO 9001 & 14001 COMPANY]

HFSR™

PRODUCT PROFILE

World

Leader in Motor

Soft Starting Technology

It all started in 1977 when our chairman Mr. Ram Bapat understood the need for import substitute development in heavy industry large size motor starting challenges, the first medium voltage soft starter was designed, manufactured and put in service in 1978 by Jayashree and the 1st of its kind solution in India, today we are the leading soft starter manufacturer Worldwide.

1. We strive to achieve...
   Our Mission is to Delight our stakeholders

2. **Customer Satisfaction** based upon
   - Integrity
   - Quality
   - Responsiveness & Ownership

3. **Employee Satisfaction** based upon
   - Shared Vision
   - Excellent Work Environment & Job Satisfaction
   - Career growth
   - Financial Reward / sharing the success

4. **Shareholder Satisfaction** based upon
   - Above average Growth
   - Above market Return on Investment
   - Good corporate citizenship

OUR VALUES : DEFINE WHO WE ARE AND GUIDE OUR ACTIONS

Integrity:

- Reflected by our professional and ethical behaviour, positive attitude and commitment to company's values, goals and objectives.
- **Initiative :** Reflected by our passion for excellence, energy and drive for results combined with proactive actions taken to resolve issues, add value and improve quality for increasing customer satisfaction.
- **Interpersonal Relationships:** Reflected by our ability to energize, influence and motivate others to strive for success of the entire team. We endeavour to build strong positive & nurturing relationships with customers
- suppliers and colleagues based on Integrity & Initiative.

OUR DESIGN PHILOSOPHY : A WIN – WIN APPROACH

Maximize customer satisfaction and peace of mind by creating:

- Quality Products that are built to last
- Reliable products that deliver consistent performance
- Value for Money products that maximize customer's Return on Investment

QUALITY POLICY

All of us at Jayashree Electron are committed to satisfy customer's requirements as applicable by providing specified quality products consistently by implementing Quality Management System and continually improving the Effectiveness of the System.

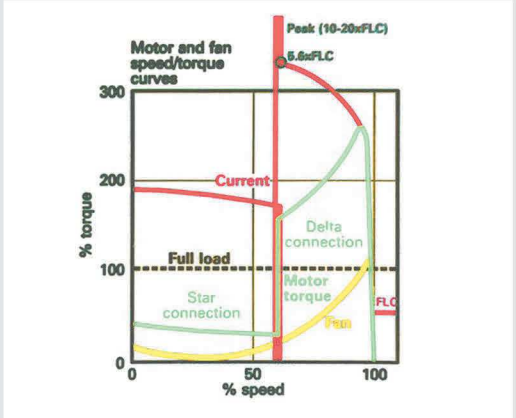
The induction motors were invented 140 years ago and till date, there is no change in the design principle. Typically, it is called as the 'thumb rule'. The only improvement achieved is over losses and efficiency for the motor design. As the 'thumb rule' cannot be changed and electrical principles for motor designing, the same way the starting of motor has a solid electrical reference.By the principles, the motor can be started by:

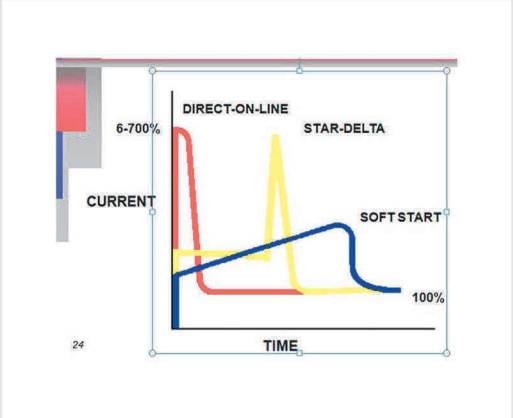
- Fixed frequency reduced voltage: autotransformer, star delta, etc. methods of starting.
- Fixed frequency variable voltage: thyristor based electronic, HFSR™, Liquid resistance
- Variable frequency variable voltage : variable frequency drive [suitable for variable speed application]

The Challenges with Other Methods :

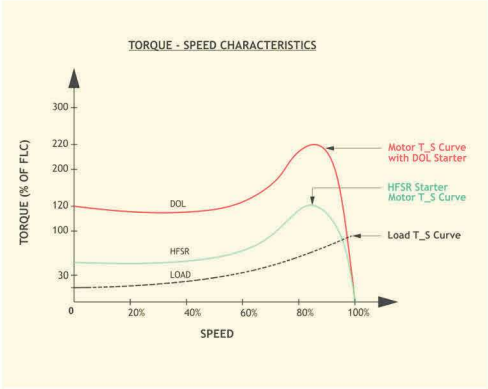
- Safeguarding the motor from 'open transition' of switchgear during starting [typical Problem of Star-Delta and autotransformer starting]
- Maintaining the pure sinusoidal nature of supply to the motor during starting as motors are inherently an analogue device [Typical problem of SCR/Thyristors based digital/semiconductor type starting]
- Delivering a precise performance over years without any time/temperature drift [Typical problem with Liquid resistance/rheostat type starting]
- Safeguarding the network from eddy currents, harmonics, resonance, voltage dips [Typical Problem of direct on the line/magnetic core, electronic and capacitor starting]
- Reducing the starting demand as close to the running demands of the motor at full load
- designing a rugged system to work at adverse site and supply conditions with the lowest possible maintenance.

In 1977, Jayashree incepted the research and design of an oil-free, mechanical wear and drift free, natural air cooled pure Electrical solution motor starting method. After conducting various experiments and tests, the 1st HFSR™ was installed in 1979 with a steel plant for 500 KW 6600-volt compressor motor. This marked the beginning of an endless era of 'engineered solution' of motor soft starting.

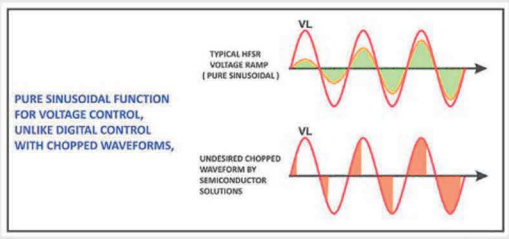




About the Product HFSR™ [Harmonics free series reactor]



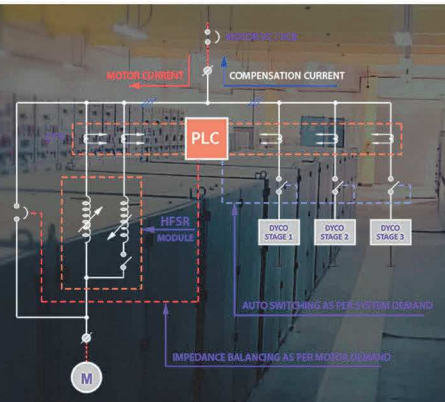
- The most reliable and suitable method to start 3 Ø squirrel cage and synchronous motors
- Technology-based on Dynamic LC impedance
- Pure Electrical core elements which are rugged and motor/application specific
- Easily replaceable components, simple design, minimal installation cost, easy to learn operations
- The only solution in a **fixed frequency variable voltage** method to start the motor up to 100 % FLC starting current
- Improved power quality and reliability of the electrical network
- Optimized solutions and implementation at BUS/distribution level
- Pure sinusoidal function
- Noise-free and eddy current free function



Pure sinusoidal function for voltage control, unlike digital control with chopped wave-forms. Chopped wave forms generate eddy currents had heating in motor winding, where as attenuated sinusoidal waveform to motor reduces stator magnetic field resulting in stress free rotor and elimination of unwanted starting torque, the idea is not just to reduce the voltage, it is about **how you reduce the voltage and ramp up**

Dynamic Series Impedance based on IS/IEC standards & auto LC circuits based upon:

- System PF and motor current feedback
- Motor thermal characteristics
- Torque and current dynamics



HFSR™ Today:

HFSR™ soft starter is a tailor-made solution 'Engineered' for motor specific Torque-speed characteristics, current-time characteristics and system parameters to meet the starting'energy' optimization and maximum demand parameters. It delivers a stepless and linear motor acceleration, which is naturally in tune with the motor dynamics during starting

Key Features of HFSR™ design:

- Strictly as per IEC/IS/NEMA standards
- Motor terminal Voltage is a function of motor speed and back EMF.
- Supply waveform Attenuation by series impedance method
- Dynamic impedance ratio WRT motor speed
- Reactive Energy recovery by dynamic compensation by active power during motor starting [DERM: Dynamic energy recovery module]
- Specially designed DVi [dynamic variable impedance] controller for close loop monitoring of energy for optimized use and improved power quality
- Engineered Air core series reactors are designed which are motor specific ensuring efficient lossless motor terminal voltage control and torque delivery [HFSR™]
- The motor continues PF correction [up to 0.99]
- Fault level limiting by series impedance
- Real-time KVA [Energy] calculations and recovery. special energy clamp function to limit corresponding equivalent current even as low as 0.9 X FLC
- Multi-motor solutions with complete automation and system integration
- Line side/neutral side installation. Most convenient for retrofitting projects
- Remote/app based * data collection and control

Key Features of HFSR™ construction:

- Natural air cooled
- IP 4X/5X/55 CNC fabricated panels
- Foundation free installation, top/bottom cable entry, explosion vent ready panels
- Built-in power switchgear and DVi PLC with communication and starting characteristic plots and calculations
- Isolated compartments for control/power and cable termination sections
- Vacuum pressure impregnated [VPI], epoxy casted, magnetically balanced IP 67, insulation class H & temperature rise up to class F processed HFSR™ components
- Fault prediction/remedy/alarm/trip/history functions
- Application specific interlocking flexibility [compressor / pump / fan / etc specific sequence and customization]
- self-healing and adaptation of parameters as per site requirements by DVi
- Standard auxiliary setup to make specific applications [Wiz. compressors/chillers/pumps/fan/crusher manufacturers]
- A wide selection of database available on HMI for self-programming
- Customization of Relay/metering with standard makes

HFSR™ design advantages:

- pure sine wave function
- up to 40 KA fault level
- acceleration time sync with motor natural back EMF constant
- harmonics suppression by air core and LC circuit
- improved power quality

Why Jayashree:

- Pioneered the technology and introduced the commercially viable product
- Legacy of 40 + years in serving the industry with patented and engineered solutions
- Tie-ups with OEM for global service and warranty
- Unmatched testing and manufacturing facilities
- Sustainable growth and assets
- Global support for sales and service

Compressor/Chiller :

Process industry (Steel/Cement/Textile etc.), centralized commercial or industrial cooling systems, Oil and Gas Industry, indoor/outdoor installations.

Compressor is an application sensitive to vibration, which usually gets developed due to high starting torque and impact, a smooth stress free acceleration and optimal starting time delivered by HFSR™ soft starter protects the compressor bearings and coupling for its long life and avoids the development of vibrations,

Lowest starting current achieved for a Compressor application is 1.25 X FLC

Pump :

Lift irrigation projects, Jackwell/Distribution/Drinking Water projects, Industrial Cooling Towers, De-watering processes, Oil and Gas Industry, etc.

Pump application is sensitive to slurry, mud, moisture, HFSR™ soft starter reduces the pump fins impact with slurry, let the pump rotate slowly to full speed and helps maintain the pump its efficiency and geometry

Lowest starting current achieved for a pump application is 1.2 X FLC

Fan :

Power/Chemical/Steel/Process Industry etc., Blower/ID/FD/Fan applications.

ID/FD fans are high inertia applications, due to inertia the motor experiences heavy resistance during initial acceleration, due to high starting torque and non linearity of torque the rotor tries to reach to full speed quicker than and load does not allow the same, load being connected to one end of the rotor , rotor experiences ‘twisting’ effect resulting in hairline cracks and insulation damage, HFSR™ soft starter delivers desired minimal torque for acceleration and de-stress the rotor. soft starter is a mandatory control for Fan application

Crusher :

Sugar/Stone/CHP/Food.

Crusher is High starting Torque application, HFSR™ comes with kick start feature and energy saving feature when run idle,

PRODUCT **RANGE**

1. **220 to 690 V HFSR(™)/ FCMA(™) SOFT STARTER**
   22 KW TO 3000 KW / 3 PHASE INDUCTION MOTORS
2. **1.1 KV TO 13.8 KV HFSR(™)/ FCMA(™)SOFT STARTER**
   90 KW TO 35000 KW / 3 PHASE SCIM/SYNC motors
3. **220 V TO 13.8 KV SLIP RING MOTOR STARTERS & SLIP REGULATORS**
   22 KW TO 20000 KW 415 V TO 13.8 KV
4. **Power and Energy Study and Consultancy**
   for optimization of resources and improving the power quality

APPLICATIONS **SERVED**

1. **Pumps**
   vertical turbine pump, Metallic Volute pump, centrifugal pump, multistage horizontal pump, submersible pump, reciprocating pump,
2. **Compressors**
   Centrifugal, screw, reciprocating, rotary, chillers.
3. **Fan**
   Process fan, blower fan, induced draft fan, forced draft fan
4. **Mills**
   Rod mill, ball mill, etc.
5. **Other applications**
   Conveyors, drag line, crusher, leveller, cane feeder, etc.

MANUFACTURING **FACILITY**

Production Shopfloor Area - 60000 sq ft

total team of 180
90 shop floor workers, 48 Engineers and others for commercial and marketing and function staff.

Storage space - 200 units

Manufacturing capacity per month **- 200 units**

Lifting cranes and loader - 10 Tons 3 axis

Component lifting stations
Two sets of 2 tons lift car, 6 shifting trolley

Power available
Available Power : 200 kW

Generator backup **- 15 KVA**

Bus bar profiling
Two set of Automatic pneumatic machine for : bus bar bending, drilling, punching, taping, sleeving and profiling,

Bus bar sleeve oven
Two automatic units of 800 Liters each.

Automatic ferruling machine
Digital Programmable automatic ferruling machine.

Other facilities
Multi story stores with automated ERP system

Renewable energy source - 40 KW solar panels

Reactor processing unit
Reactor processing unit with 10000 Liters Vacuum impregnation machine and 6 spool winding machines, two numbers of 5000 Liters reactor backing oven

Automatic Reactor winder machine Vacuum impregnation and over setup
Epoxy casting molds and Tap brazing machine

TESTING **FACILITY**

1. **200 KW 6.6 KV SCIM test bench**
   1 No. equipped with real time soft starter demo and testing

2. **AC/DC current injection kit**
   Up to 2000 A for heat run test and power loss test

3. **HV tester**
   Up to 30 KV Two sets of

4. **Megger**
   1KV/5KV Two sets of

5. **Thermal imaging camera**
   -20 ^{o}C to +300^{o}C with memory [4000 images]
   CE :EN 613261:2006-

6. **Digital temperature scanner**
   0200^{o}-C

7. **Digital clamp meter**
   02000- A AC/DC Five sets of

8. **Digital impedance meter**
   Ω/mH/µF with LC of 0.01 Four sets of [SCIENTIFIC, MODEL - L C R Q BRIDGE 6018]

9. **IP test setup**
   up to IP 67

10. **Humidity chambers**
    200 ltrs 100 % humidity S1 [IS 9000]

11. **Temperature chambers**
    -40^{o}C to +300^{o}C[IEC 609472-5-]

12. **EMI/EMC test setup**
    As per standards[IEC 610001/4/2/5/11-4-

13. **Digital venire caliper**
    0 to 200 mm with 0.01 List count

14. **PLC programming/debugging station**
    2 numbers

TYPE TEST **CERTIFICATES**

Fault level of soft starter panel

40 KA for 1 second, 100 KA peak short time as per IEC 62271200:2011-

Lightning impulse withstand voltage

75 kV (peak) 28 kV for one minute

Temperature rise test

@1200A as per IEC 62271-1:2017,200:2011-

Self extinguishing arc test

65 kA RMS for 0.1 second and 143 kA peak as per IEC TR 61641 E 3

Impedance measurement test

Reactors and Transformers

IP test

4X/5X/6X/67

FACTORY **CERTIFICATES**

1. ISO 9001:2015
2. ISO 14001 : 2015

bsi.

By Royal Charter

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that: JAYASHREE ELECTRON PVT LTD
E-12/13
"J" BLOCK, MIDC
BHOSARI
PUNE 411 026
Maharashtra
India

Holds Certificate No: **EMS 700310**

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

Design and manufacture of motor soft starters and Control Panel

CERTIFICATE

Management system as per
ISO 9001 : 2015

In accordance with TÜV NORD CERT procedures, it is hereby certified that

JAYASHREE ELECTRON PVT. LTD.
UNIT I: EL - 34, J Block, MIDC Bhosari, Pune - 411 026
UNIT II: EL - 12 & 13, J Block, MIDC Bhosari, Pune - 411 026, Maharashtra, India

applies a management system in line with the above standard for the following scope

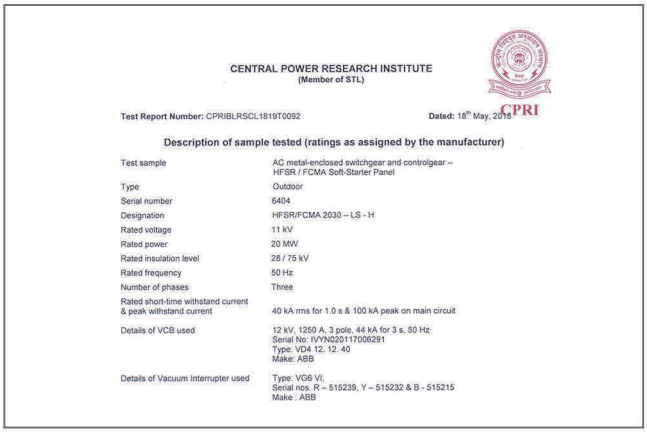
Design and Manufacture of Automation and Control Products for Speed, Position and Power such as Proximity Switches, Electronic Speed Switches and Motor Soft Starters

Certificate Registration No. **44 100 094387**
Audit Report No. **2.5-4499/2009**

Valid until **25.09.2021**
Initial certification **24.12.2009**

Certification Body
at TÜV NORD CERT GmbH

Issue **26.09.2018**
Place : **Mumbai**



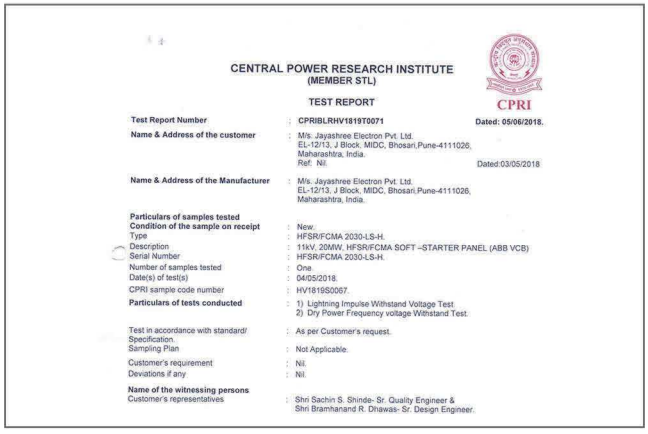
CENTRAL POWER RESEARCH INSTITUTE
(Member of STL)

CPRI

Test Report Number: CPRIBLRSCL1819T0092 **Dated:** 18th May, 2018

Description of sample tested (ratings as assigned by the manufacturer)

Test sample	AC metal-enclosed switchgear and controlgear – HFSR / FCMA Soft-Starter Panel
Type	Outdoor
Serial number	6404
Designation	HFSR/FCMA 2030 – LS - H
Rated voltage	11 kV
Rated power	20 MW
Rated insulation level	28 / 75 kV
Rated frequency	50 Hz
Number of phases	Three
Rated short-time withstand current & peak withstand current	40 kA rms for 1.0 s & 100 kA peak on main circuit
Details of VCB used	12 kV, 1250 A, 3 pole, 44 kA for 3 s, 50 Hz Serial No: IVYN020117006291 Type: VD4 12. 12. 40 Make: ABB
Details of Vacuum Interrupter used	Type: VG6 VI, Serial nos. R – 515239, Y – 515232 & B - 515215 Make : ABB



CENTRAL POWER RESEARCH INSTITUTE
(MEMBER STL)

TEST REPORT

CPRI

Test Report Number	: CPRIBLRHV1819T0071	**Dated: 05/06/2018.**
Name & Address of the customer	: M/s. Jayashree Electron Pvt. Ltd. EL-12/13, J Block, MIDC, Bhosari,Pune-4111026, Maharashtra, India. Ref: Nil.	Dated:03/05/2018
Name & Address of the Manufacturer	: M/s. Jayashree Electron Pvt. Ltd. EL-12/13, J Block, MIDC, Bhosari,Pune-4111026, Maharashtra, India.	
Particulars of samples tested		
Condition of the sample on receipt	: New.	
Type	: HFSR/FCMA 2030-LS-H.	
Description	: 11kV, 20MW, HFSR/FCMA SOFT –STARTER PANEL (ABB VCB)	
Serial Number	: HFSR/FCMA 2030-LS-H.	
Number of samples tested	: One.	
Date(s) of test(s)	: 04/05/2018.	
CPRI sample code number	: HV1819S0067.	
Particulars of tests conducted	: 1) Lightning Impulse Withstand Voltage Test 2) Dry Power Frequency voltage Withstand Test.	
Test in accordance with standard/ Specification.	: As per Customer's request.	
Sampling Plan	: Not Applicable.	
Customer's requirement	: Nil.	
Deviations if any	: Nil.	
Name of the witnessing persons Customer's representatives	: Shri Sachin S. Shinde- Sr. Quality Engineer & Shri Bramhanand R. Dhawas- Sr. Design Engineer.	

TOTAL NUMBER OF **INSTALLATIONS**

More than 8000

MOST **CRITICAL INSTALLATION**

12 MW 13.8 KV oil rig at Singapore

MAJOR GLOBAL **EXPORT TO:**

Thailand, Singapore, Indonesia, Turkey, Malawi, Qatar, Kazakhstan, Yemen, Tunisia, Vietnam, Philippines, Saudi Arabia, UAE ,Ghana, Uzbekistan, Bangladesh, Tanzania and many more.

GLOBAL **MAJOR OEM BUSINESS**

1 **Pumps**
Wilo, Kirlosker, WPIL, BHEL, Xylem, M&P, Jyoti, KSB, Ebara, Flowmore .

2 **Compressors**
Atlas copco,Cameron,Carrier,Elgi,FS Elliott, Ingersoll rand, KPCL, MAN, Teco-samsung, Trane.

INDUSTRY **SEGMENT**

steel plants, cement plants, oil and gas process and refinery plants, sugar plants, lift irrigation schemes, drinking water projects, Water Distribution and reservoirs, coal fields, textile industry, oil rigs, CHP, mining, power generation, sulphuric acid, chemical plants, sewerage and storm water projects, railways, defence, food processing industry, airports, malls, commercial complex cooling and pumping, etc.

CONSULTANT **APPROVALS**

Apex,Aquatherm,CNNL,DCPL,DRA,EIL, Electromech,Fitchner,Gerzi,GRW,Jacobs,KBJNL,KNNL, Kubota,KUWSDB,Mars,MECON,M N Dastur,Motts Macdonald,Multi Mantech,MWH,NJS,NOVEL,NTPC, RAY,RITES,SAIL- CPT,SCIPL,SGS,Shah Tech,SNE, Strucwell,TCE,TUV,Veritas,VJNL,Wapcos,and more...

GOVT. APPROVALS **AND INSTALLATION**

All metro municipal corporations,APSIDC,BWSSB, Chennai metro,DJB,GWIL,GWSSB,HNSS,I & CAD, KMC,MKVDC,NVDA,Orissa WRD,PHED,SSNL, WRD Maharashtra, KPCL, KNNL, UPJNL, TSGENCO, Govt. of Jharkhand, WRD - MP, TWAD, KWA , SAUNI YOJANA, MCGM, BMC, NVDA, IOCL, HPCL, etc.

CONTACT US

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