»Hardware

Built-in Programmable Logic Controller (PLC)

Built-in PLC set provides customized solutions which support wide coverage from small/middle – to large size-system.





andard : RS-485 nal : Profibus, DeviceNet, Modbus, Metasys N2, LonWorks

PLC set, made by LSIS, is the next-generation solution with a new concept providing advanced engineering environment base on open network, fastest processing speed, compact size and user-friendly software.



»Monitoring

Human Machinery Interface(HMI)

Touch screen for MV drive contains a brand new HMI product with an intensive and advanced technology of LSIS to cope with the rapidly changing market situation. It is an innovative product having both reliability and convenience based on Windows CE

External Interface











Serial



Leading Solution for Your Investment Leading Solution for Your Development Leading Solution for Our Environment



LSIS always focuses on environment-friendly devices and energy management system to minimize greenhouse gas emission, waste of energy, and environmental pollution.

LSIS has been manufacturing drive solution for more than 30 years. This experience provides convenience and high efficiency that anytime, anywhere, anyone can use.



· For your safety, please read user's manual thoroughly before operating. · Contact the nearest authorized service facility for examination, repair, or adjustment. Please contact a qualified service technician when you need maintenance. Do not disassemble or repair by yourself! · Any maintenance and inspection shall be performed by the personnel having expertise concerned

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Specifications in this catalog are subject to change without notice due to tinuous product development and improven

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LS Medium Voltage VFD(E) 2009, 03/(06) 2012, 04 Printed in Korea Pacomkorea



Medium Voltage VFD

Perfect Energy Saving Drive

3kV 200kVA ~ 3,700kVA / 4kV 250kVA ~ 4,700kVA 6kV 400kVA ~ 7,500kVA / 10kV 600kVA ~ 11,000kVA 11kV 800kVA ~ 13,000kVA



» Circuit Configuration



Master Control Section

Touch-screen(HMI) interface on door nrough the RS-485 is standard.

Power Cell Panel

output phas

terminal and 36pulse/18winding of dry type phase-shift transformer has equipped. Also it has constructed 5% tap for input

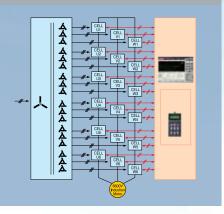
Multi-Winding Transformer

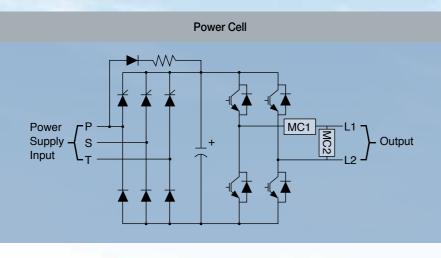
Easy Maintenance

ower cells can be replaced and maintained individually duces the replacement time and facilitates maintenance

Engineered to continue operating through component failures that would completely disable conventional drives. The patented cell-based configuration maximizes availability, letting the customer determine the right time to perform maintenance, while the modular design reduces system repair time to minutes.

6.0 ~ 6.6kV Class





»Fields of Application

Pulp and Paper Chemical, Oil and Gas SIS MV Drive offers ease of setup and comprehensive fan and motor protection features. Water and Waste Water Management Cement and Mining Fans/Exhausters Sugar

» Service and Support

Testing

et every component of a drive is subjected to thorough testing in nized test facilities of LSIS.

Training

S provides extensive training for its MV Drives. A range of training grams is offered from basic tutorials to programs tailored to the omer's specific needs.



» Technical Specification

P	11	m	n	c
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LSIS' unequalled experience was used to make MV Drive the perfect match for pump applicati With a wide range of powerful standard features designed specifically for pump application, LSIS MV Drive provides the lowest overall cost of ownership of any drive available.

Fans

SIS MV Drive can be configured for Simplex, Duplex or Triplex fan system applications. One MV Drive can be used as a master, which can also control one or two secondary fan motors. The secondary pump motors can be connected using mechanical motor starters, reduced voltage soft starters, or additional MV Drives. The most efficient method is fan speed control that will reduce energy consumption, while

Mills

Another advantage is that the electrical drives can estimate the shaft torque and protect the mill gainst overload. In this case the mill can be driven in reverse to get the excess material out of the machine and resume normal operation with minimum production loss.

Furthermore, after shut down, the cane mill driven by LSIS MV Drive returns to operating conditions much faster than the steam turbine driven mill. Finally, LSIS MV Drive, the noise level is considerably reduced for both MV Drive and the motors and is almost negligible compare to that of

Installation and Commissioning

n addition, operators can be given practical training by experienced ialists on site.

Life-Cycle Management

quish the responsibility for servicing our products to your full faction, regardless of the age of the product. To extend the life an and increase the functionality of the drive, the LSIS refurbishr rogram gives you the opportunity to upgrade the MV drives with ne chnology as it becomes available.

StapPiorFinal sequencySolid circleGenerationApprox.96.5% (At raide	Main power	Voltage	3.3kV, 4.16kV, 6.6kV, 10kV, 11kV			
Power Factor Approc: 96.5% (Af taids	Supply	Frequency	50Hz, 60Hz			
General SpecificationCooling MethodForcod air-cooling by la"Input Current THDSatisfies IEEE StandardInput TransformerClass H day type, secondary multi-phase windingMontoring12.1 inch HMI touch scree-CormunicationStandard: RS-465, Options, DeviceNetl, Modus, Metasys N2, LonWorksSenderic RS-465, Options, DeviceNetl, Modus, Metasys N2, LonWorksNI, Sensoriess VectorSenderic RS-465, Options, DeviceNetl, Modus, Metasys N2, LonWorksNI, Sensoriess VectorSenderic RS-465, Options, DeviceNetl, Modus, Metasys N2, LonWorksNI, Sensoriess VectorFreq. Control Range0 to 120H2Freq. Control Accuracy0.10142Freq. Control Accuracy0.1142Freq. Control Accuracy0.1142Freq. Control Accuracy0.1142Vectorad Tolerance120% tor 603Vectorad Tolerance120% tor 603SepcilicationsSynchronous BypassPring start (speed search)Main Control FunctionsSynchronous BypassPring start (speed search)Main Control FunctionsSynchronous BypassPring start (speed search)Main Control FunctionsSig compensationIntegrational doceleration rangoSig compensationNotecurinel acceleration and doceleration rangoSig compensation <td></td> <td>Efficiency</td> <td colspan="4">Approx. 98.5% (At rated motor speed, 100% load)</td>		Efficiency	Approx. 98.5% (At rated motor speed, 100% load)			
General Specification Input Current THD Statisfie IEEE Standard Input Transformer Class H dry type, secondary multi-phase winding Monitoring 12.1 inch HMI touch screen Control Mendo Standard: BS-485, Option: Frontibus, DeviceNet, Modous, Metasys N2, LonWorks Control Mendo VM: SensoriesS Vector Switching Device IGBT(Insulated Gate Bipolar Transistors) Main Circuit Multi-Sevel pulse width modu/aton/Multi-Sevel PWM/) Freq. Control Range 0 to 120Hz Freq. Control Range 0.011/2 Freq. Control Range 0.011/4 Freq. Control Accounce 0.011/4 Acad/Decel Time 0.011/4 Acad/Decel Time 0.011/4 Main Control Functions Synchronous Bypass Fying start (speed search) Main Control Functions Synchronous Bypass Fying start (speed search) Multi Motor Control Multi Motor Control Multi Motor Control Main Control Functions Frequency jump Keysad with LCD + LED displays Jag function Net-Intrology Operating during momentary power loss) Auto-Uning Faut Auto-diagnosis and Auto-reset		Power Factor	Approx. 95.5% (At rated motor speed, 100% load)			
Specification Input Transformer Glass H dry type, secondary multi-phase winding Monitoring 12.1 inch HMI touch screen- Communication Standard: R9.485, Option: Profibus, DeviceNet, Modbus, Melasys N2, LonWorks Viri, Sensoriess Vector Station: Profibus, DeviceNet, Modbus, Melasys N2, LonWorks Station: Control Method Viri, Sensoriess Vector Station: Control Mathod Viri, Sensoriess Vector Freq. Control Range 0 to 120Hz Drive Type Voltage Source Freq. Control Accuracy 4.01% Orefoad Tolerance 0.116 2005 Synchronous Bypass Flying start (speed search) Multi Motor Control Manual and Auto Torque boost Freq. Control Accuracy 2.0% for 60% Synchronous Bypass Flying start (speed search) Multi Motor Control Manual and Auto Torque boost Freq. Control Accuracy 2.0% for 60% Vario Uning Fluing Start (speed search) Sing function Manual and Auto Torque boost Freq. Control Functions Freq. Control Manual and Auto Torque boost Jog function Local/Fiemotio Operation selection<		Cooling Method	Forced air-cooling by fan			
Input Transformer Class H day type, secondury multiphase winding Monitoring 12.1mm HMI touch scree Tommination Standard: RS-486, Option: Proflux, DeviceNete, Module, Metasys N2, Lon Works Solven Import Control Method IGBT(Insulated Gate Bipolar Transistors) Main Grout GBT(Insulated Gate Bipolar Transistors) IGBT(Insulated Gate Bipolar Transistors) Freq. Control Range 10.102VL IGBT(Insulated Gate Bipolar Transistors) Freq. Control Accursory 10.102VL IGBT(Insulated Gate Bipolar Transistors) Freq. Control Accursory 0.112 IGBT(Insulated Gate Bipolar Transistors) Accel/Dead Time 0.01H2 IGBT(Insulated Gate Bipolar Transistors) Main Grout Coll Accursory 10.050 IGBT(Insulated Gate Bipolar Transistors) Main Grout Gateance 10.050 IGBT(Insulated Gate Bipolar Transistors) Main Grout Gateance IGDI Grout Gateance IGBT(Insulated Gate Bipolar Transistors) Main Grout Gateance IGDI Grout Gateance IGBT(Insulated Gate Bipolar Transistors) Insult Accurso Insult Insult Acuto Insultacuto Insult Acuto Insult Acuto Insultacuto Insult Acuto		Input Current THD	Satisfies IEEE Standard			
Ormanuication Sandard: RS-485, Option: Profibus, DeviceNet, Modbus, Melasys N2, LonWorks Control Method VI, Sensoriess Vector Main Circuit IGBT(insulated Gate Bip-lar Transistors) Main Circuit Multi-level pulse width modulation(Multi-level PVM) Freq. Control Range 0 to 1242 Freq. Control Range 0 to 1242 Freq. Control Accuracy > 0.19% Freq. Resolution 0.0142 Acce/Decel Time 0.110 6000s Overload Tolerance 20% for 60s Synchronous Bypass Flying start (speed search) Multi Molor Control Manual and Auto Torque boost Multi Molor Control Manual and Auto Torque boost Copy function Upper/lower limits for frequency reference Copy function Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Iog function Inder vortige Auto-tuning Sing compensation Direction of Rotation selection ramps Sing function Resourd to protect drive programming Ver current Cocling-far trip Overvoltage Transf		Input Transformer	Class H dry type, secondary multi-phase winding			
Control Method Vfl. Sensoridess Vector Switching Device IGBT(insulated Gate Bipolar Transistors) Main Circuit Multi-level pulse width modulation(Multi-level PVM) Freq. Control Range 0 to 120Hz Drive Type Voltage Source Freq. Control Accuracy ±0.1% Freq. Control Accuracy ±0.1% Accel/Decel Time 0.01Hz Accel/Decel Time 0.1 to 6000s Overload Tolerance 120% for 60s Overload Tolerance 59nchronous Bypass Flying start (speed search) Multi Motor Control Manual and Auto Torque boost 10 PID control Upper/ower limits for frequency reference Copy function Local/Femote Operation selection Auto-tuning Fault Auto-diagnosis and Auto-reset Divel Jourcion Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Divel Jourcion Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Ontor Jourcion Sign control Functions Gecuronal Color of cours on contactation selection for		Monitoring	12.1 inch HMI touch screen			
Switching Device IGBT (Insulated Gate Bipolar Transistors) Main Circuit Multi-level pulse width modulation(Multi-level PVM) Freq. Control Range 0 to 120Hz Drive Type Voltage Source Freq. Control Accuracy ±0.1% Vertrol 120% for 60% Vertrol Synchronous Bypass Flying start (speed search) Multi Motor Control Manual and Auto Torque boost Multi Motor Control Multi Motor Control Upper/Jover limits for frequency reference Copy function Lical/Femole Operation selection Main Control Functions File Control Upper/Jover limits for frequency reference Jover limits for frequency reference Sigli componsation Direction of Robation selection file Multi-Rober Polymaning Jover limits for frequency for for for for for for Polymaning Paraderaf <t< td=""><td>Communication</td><td colspan="4">Standard: RS-485, Option: Profibus, DeviceNet, Modbus, Metasys N2, LonWorks</td></t<>		Communication	Standard: RS-485, Option: Profibus, DeviceNet, Modbus, Metasys N2, LonWorks			
Notify the second sec		Control Method	V/f, Sensorless Vector			
Freq. Control Range0 to 120HzDrive Typevoltage SourceFreq. Control Accuracy± 0.1%Freq. Control Accuracy± 0.1%Freq. Resolution0.01HzAccel/Docel Time0.1 to 6000sOverload Tolerance120% for 60sVerload Tolerance120% for 60sMulti Motor ControlManual and Auto Torque boostProceptionMulti Motor ControlMulti Motor ControlManual and Auto Torque boostProceptionCopy functionCopy functionCock/Remote Operation selectionFrequency jumpKeypad with LOP LED displaysMain Control FunctionsFrequency jumpKeypad with LOP LED displaysJog functionRide-Through (operating during momentary power loss)Auto-tuningFault Auto-diagnosis and Auto-resetJowelIndependent acceleration and deceleration rampsSilip compensationDirection of Rotation selection(FWD/REV)3-wire sequencePassword to protect drive programmingVervoltageCell overheatOvervoltageTransformer overheatMandardCell overheatOvervoltageCell overheatInder voltageStatus display, Fault display, Faumeter setting, Parameter referenceMain GroutStatus display, Fault display, Faumeter setting, Parameter referenceMain GroutStatus display, Fault display, Faumeter setting, Parameter		Switching Device	IGBT(Insulated Gate Bipolar Transistors)			
Drive Type Voltage Source Freq. Control Accuracy ±0.1% Freq. Resolution 0.01Hz Accel/Decel Time 0.1 to 600s Overload Tolerance 120% for 60s Verload Tolerance 120% for 60s Name Natual and Auto Torque boost PID control Manual and Auto Torque boost PID control Upper/lower limits for frequency reference Copy function Local/Remote Operation selection Main Control Functions Frequency Jump Keypad with LCD + LED displays Jog function Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Jouel Independent acceleration and deceleration ramps Slip compensation Direction of Rotation selection(FMD/REV) Jawire sequence Passord to protect drive programming Over outrage Transformer overheat Freue voltage Conting-fa trip Over outrage Conting-fa trip Over outrage Contou fault Cal overheat Freue voltage Conmunuications error, etc. Maint		Main Circuit	Multi-level pulse width modulation(Multi-level PWM)			
Freq. Control Accuracy9.01%Freq. Resolution0.01HzAccel/Decel Time1.10 600sOverload Tolerance12% for 60sNumber SpecificationManual and Auto Torque boostMulti Motor ControlManual and Auto Torque boostPID controlUpper/lower limits for frequency referenceOpper/lower limits for frequency referenceCopy functionGoty functionLocal/Remote Operation selectionJoing functionRide-Through (operating during momentary power loss)Auto-luningFault Auto-diagnosis and Auto-resetJoing functionDirection of Rotation selection(FMD/REV)Sender CompensationDirection of Rotation selection(FMD/REV)Sender CompensationOrevortageProtectiveConding-fan tripFunctionsColorolagalFunctionsColorolagalFunctionsColorolagalMaint Goti To PanelSatua display, Faunteer setting, Parameter referenceProtection DesignSatua display, Faunt display-Maint TomperatureSondard : IP21, Optiona: IP52Maint TomperatureSondard : IP21, Optiona: IP52Maint TomperatureSindard: IP21, Optiona: IP52Maint TomperatureSindar		Freq. Control Range	0 to 120Hz			
Final Resolution0.01H2Acct/Decl Time0.15 6005Overload Tolerance20% for 60sMail Molor ControlManual and Auto Torque boostProcessionFiD controlManual and Auto Torque boostPhilo controlCoal/Remote Operation selectionProcessionFrequency jumpKeypad with LCD + LED displaysAuto-tiningRide-Through (operating during momentary power loss)Auto-tuningFide Operation and deceleration rampsBig compensationDirection of Rotation selection(FWD/REV)Sig compensationOrient of Portal during momentary power loss)ProtectiveVerorentalCooling-fan tripFunctionSile compensationOrient operation and deceleration rampsBig compensationDirection of Rotation selection(FWD/REV)FunctionSile compensationCooling-fan tripFunctionColing-fan tripColing-fan tripFunctionColing-fan tripColing-fan tripFunctionGind routingColing-fan tripFunctionSile compensationOrive overloadFunctionColing-fan tripColing-fan tripFunction DesignSile display, Fault display, Fa		Drive Type	Voltage Source			
Acet/Deel Time0.1 to 600sOverload Tolerance12% for 60sSynchronous BypassFyling start (speed search)Muiti Motor ControlManual and Auto Torque boostProbectivePID controlUpper/Jower limits for frequency referenceProdectiveFrequency jumpKeypad with LCD + LED displaysAuto-tuningRide-Through (operation selection)ProdectiveFrequency jumpRide-Through (operating during momentary power loss)Auto-tuningRide-Through (operating during momentary power loss)Big compensationDirection of Rotation selection(FWD/REV)Sig compensationDirection of Rotation selection(FWD/REV)Big compensationDirection of Rotation selection(FWD/REV)Big compensationColoing-fan tripProtectiveOver currentColoing-fan tripBinder voltageCell faultControl FunctionsGround faultCell overheatGround faultCell overheatCell overheatForeion DesignGuind routing corrente:MaintainabilityForeion DesignGuindrall: F2: Termeter setting, Parameter referenceFortion DesignSingel FunctionFore-440°CFunctionFore-440°C		Freq. Control Accuracy	± 0.1%			
Control Overload Tolerance 100% for 60% Specifications Synchronous Bypass Flying start (speed search) Mult Motor Control Manual and Auto Torque boost PID control Upper/lower limits for frequency reference Copy function Local/Remote Operation selection Frequency jump Keypad with LOD + LED displays Jog function Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Jog function Independent acceleration and deceleration ramps Silp compensation Direction of Rotation selection(FWD/REV)/REV) 3-wire sequence Password to protect drive programming Over ourrent Cooling-fan trip Over outrent Coling-fan trip Over outrent Cell fault More voltage Flait overlead Over overheat Orive overlead Torive overlead Torive overlead More voltage Cell roverleat More voltage Cell roverleat More voltage Cell roverleat More voltage Conmunications error, etc.		Freq. Resolution	0.01Hz			
Specifications SpecificationsSynchronous BypassFlying start (speed search)Nulti Motor ControlManual and Auto Torque boostPID controlUpper/lower limits for frequency referencePID controlLocal/Remote Operation selectionPrequency jumpKeypad with LCD + LED displaysJog functionRide-Through (operating during momentary power loss)Auto-tuningFault Auto-diagnosis and Auto-resetDwellIndependent acceleration and deceleration rampsSpip compensationDirection of Rotation selection(FWD/REV)Surare sequenceAswire sequenceProtectiveOver currentColong-fan tripOvervoltageInder voltageCell faultOrder voltageOrder voltageInder voltageOrder voltageInve overheatOrder overheatInve overheatOrder overheatInve overheatOrder overheatProtecton DesignStandard :1P21. Option::FS2MaintainabilityFord Citalion:SpecificationsStrage TemperatureSpecificationsStrage Temperature<		Accel/Decel Time	0.1 to 6000s			
Specifications Fying start (speed search) Multi Motor Control Manual and Auto Torque boost PID control Upper/lower limits for frequency reference Copy function Local/Remote Operation selection Frequency jump Keypad with LCD + LED displays Jog function Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Dwell Independent acceleration and deceleration ramps Silp compensation Direction of Rotation selection(FWD/REV)		Overload Tolerance	120% for 60s			
Multi Motor ControlManual and Auto Torque boostFID controlUpper/Jower limits for frequency referenceCopy functionLocal/Remote Operation selectionFrequency jumpKeypad with LCD + LED displaysJog functionRide-Through (operating during momentary power loss)Auto-tuningFault Auto-diagnosis and Auto-resetJowellIndependent acceleration and deceleration rampsSilp compensationDirection of Rotation selection(FWD/REV)Jower currentCooling-fan tripOver outrentCooling-fan tripInder voltageCell faultGourd faultCell overheatInder voltageCell faultGourd faultColl overheatTorie overheatDrive overheatInder voltageDirive overheatMulti dotor Operation Serror, etc.Motor overheatMinitaniabilityStandard: IP21, Option=! Farameter setting, Parameter referenceMinitaniabilityPower cell constructorStandard:Standard: IP21, Option=! Farameter setting, Parameter referenceMinitaniabilityFourier constructorMinitaniabilityStandard: IP21, Option=! Farameter setting, Parameter referenceMinitaniabilityFourier constructorStandard:Standard: IP21, Option=! Farameter setting, Parameter referenceMinitaniabilityFourier constructorMinitaniabilityStandard: IP21, Option=! Farameter setting, Parameter referenceMinitaniabilityFource constructorStandard:Standard: IP21, Option=! Farameter setting, Parameter setting, Parame			Synchronous Bypass	Flying start (speed search)		
Maintonionionionionionionionionionionionionio	opeomodione	Main Control Functions	Multi Motor Control	Manual and Auto Torque boost		
Main Control Functions Frequency jump Keypad with LCD + LED displays Jog function Ride-Through (operating during momentary power loss) Auto-tuning Fault Auto-diagnosis and Auto-reset Dwell Independent acceleration and deceleration ramps Sipi compensation Direction of Rotation selection(FWD/REV) Swere sequence Password to protect drive programming Verovoltage Coling-fan trip Verovoltage Coling-fan trip Verovoltage Colino dult Ground fault Cell auto-tense Orie overheat Divie overheat Drive overheat Drive overheat Drive overheat Drive overheat Maintainability Standard: IP21, Option=! F-z Maintainability Fredecton Design Maintainability Storage Temperature			PID control	Upper/lower limits for frequency reference		
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Protective Functions Control Panel Over current Cooling-fan trip Over oursent Cooling-fan trip Over oursent Cooling-fan trip Over oursent Cooling-fan trip Cooling-fan trip Cooling-fan trip Over oursent Cooling-fan trip Cooling-fan trip Cooling-fan trip Over oursent Cooling-fan trip Cooling-fan trip Cooling-fan trip Over oursent Coling-fan trip Cooling-fan trip Cooling-fan trip Over oursent Coling-fan trip Cooling-fan trip			Frequency jump	Keypad with LCD + LED displays		
Image: Protective Function Image: Protective Function <th< td=""><td></td><td>Jog function</td><td>Ride-Through (operating during momentary power loss)</td></th<>			Jog function	Ride-Through (operating during momentary power loss)		
Image: Protective Function Silp compensation Direction of Rotation selection(FWD/REV) Protective Functions 0 9 <td></td> <td>Auto-tuning</td> <td>Fault Auto-diagnosis and Auto-reset</td>			Auto-tuning	Fault Auto-diagnosis and Auto-reset		
Protective FunctionsIndexIndex sequenceIndex			Dwell	Independent acceleration and deceleration ramps		
Protective FunctionsOver currentCooling-fan tripProtective FunctionsOver outrageTransformer overheatUnder voltageCell faultGround faultCell overheatGround faultCell overheatDrive overheatDrive overheatMotor overheatOver overheatMotor overheatCommunications error, etc.Protection DesignStatus display, Fault display. Fauneter setting, Parameter referenceMain CircuitPower cell constructionAmbient Temperature-5°C ~ +40°CStorage Temperature-20°C ~ +60°C			Slip compensation	Direction of Rotation selection(FWD/REV)		
Protective Functions Standard Overvoltage Transformer overheat Under voltage Cell fault Cell fault Cell fault Ground fault Cell overheat Drive overheat Drive overheat Drive overheat Motor overheat Drive overheat Drive overheat Drive overheat Drive overheat Motor overheat Status display, Fault display. F			3-wire sequence	Password to protect drive programming		
Protective Functions Standard Under voltage Cell fault Ground fault Cell overheat Cell overheat Drive overheat Drive overload Motor overheat Communications error, etc. Protection Design Standard : IP21, Optional : IP52 Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C			Over current	Cooling-fan trip		
Functions Standard Ground fault Cell overheat Functions Ground fault Cell overheat Drive overheat Drive overload Motor overheat Communications error, etc. Vertications Status display, Fault display, Parameter setting, Parameter reference Protection Design Standard : IP21, Optional : IP52 Maintainability Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C -20°C ~ +60°C		Standard	Overvoltage	Transformer overheat		
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Motor overheat Communications error, etc. Kontrol Panel Status display, Fault display, Fault display, Parameter setting, Parameter reference Protection Design Standard : IP21, Optional : IP52 Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C	Functions		Ground fault	Cell overheat		
Kinitainability Control Panel Status display, Fault display, Parameter setting, Parameter reference Maintainability Protection Design Standard : IP21, Optional : IP52 Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C			Drive overheat	Drive overload		
Maintainability/ Protection Design Standard : IP21, Optional : IP52 Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C			Motor overheat	Communications error, etc.		
Maintainability/ Environmental Specifications Main Circuit Power cell construction Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C		Control Panel	Status display, Fault display, Parameter setting, Parameter reference			
Environmental Specifications Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C	Environmental	Protection Design	Standard : IP21, Optional : IP52			
Specifications Ambient Temperature -5°C ~ +40°C Storage Temperature -20°C ~ +60°C		Main Circuit	Power cell construction			
-20°C ~ +60°C		Ambient Temperature	-5°C ~ +40°C			
Humidity 85%RH max.(no condensing)		Storage Temperature	-20°C ~ +60°C			
		Humidity	85%RH max.(no condensing)			