

# Liebert®

Hipulse-S

25 – 200kVA

1ph

Digital UPS for the Digital World and Industrial Automation



## Applications

## Industrial Process Automation

- Petrochemicals & refineries
- Oil & gas production
- Power generation & utility industries
- Chemical and pharmaceutical industries
- Primary metal and steel industries
- Pulp & paper industry
- Other process industries like textile, mining, cement
- Bio-Chemical industries
- Fertilizer industry

## Information Technology

- Data centers, IDC, ITES, BPO
- Servers {LAN,WAN, MAN ERP, e-mail,web and others)
- Networking

## Telecommunication

- Mobile {2G,2.5G,3G}
- Paging
- Fixed {including WLL}

## Transport Automation

- Airport automation and flight booking
- Others including railways & road transport automation
- Ticketing

#### Building Automation

- Access control
- Security system
- Other critical application

From reliability to availability, scalability to redundancy, user-friendliness to maintainability, parallelibility to connectivity, investment protection to lower cost of ownership, whichever value you need, Liebert<sup>®</sup> Hipulse-S address them efficiently and effectively.

Liebert<sup>®</sup> Hipulse-S is carefully designed to maximize the "availability" of your critical loads to ensure that business is protected to the extent possible against power failure and J or power quality problems. This is the Prime Objective for which the Liebert<sup>®</sup> Hipulse-S is built. Beside this, Liebert<sup>®</sup> Hipulse-S is designed to address many other "customer values".

More than ever before, this new millennium would require your critical applications to these applications to be UP all the time. Any downtime of these applications will directly impact your business goals of revenue growth and your customer satisfaction.





# **FEATURES**

- Rated at 0.8 output power factor to deliver more real power
- On-Line double conversion
- IGBT based PWM inverter
- Wide input voltage tolerance (+15/-15%)
- Wide input frequency tolerance (+/-6%)
- Automatic battery testing
- High overload capability of static bypass (14 times for 10 milliseconds and 10 times for 100 milliseconds)
- Ingress protection IP 31IIP32IIP 41 IP/ 42
- Capability to handle:
- High crest factor loads /100% nonlinear loads
- Built-in maintenance bypass (Single and 1+N Models)
- Front access for spares replacement and preventive maintenance
- Provision to use any type of battery: Wet cells (tubular plante), Valve Regulated Lead Acid (VRLA) / maintenance free and nickel cadmium
- Adjustable frequency synchronization window up to +/-9% in the static bypass
- Provision of automatic battery circuit breaker instead of using conventional isolator in the DC path
- Advance & battery management
- Selectable timer for boost charging duration of the battery. (15 steps with each step of 1 hour)
- Overload capability of the UPS:
- 110% full-load for 60 minutes
- 125% full-load for 10 minutes
- 135%-150% full-load for 60 seconds
- Field protocols ModBus
- Compact footprint
- Fan redundancy
- Parallelability: Up to 6 module can be parallel for capacity enhancement/ redundancy.

## Liebert<sup>\*</sup> Hipulse-S Outperforms Conventional UPS Systems in Three Clear Ways:

- 1. Proven Track Record
- 2. Availability and
- 3. State of art Technology

Liebert<sup>®</sup> Hipulse-S has been designed to suit conditions harsh environment in industrial and manufacturing facilities. We do not experiment at your cost. Liebert<sup>®</sup> Hipulse-S UPS System is aesthetically designed to match the decor of Industrial Control, Data Processing, Medical Diagnostics Equipment, Laboratory rooms with Elegantly powder coated cabinet.

## **Selectable Options**

- Field settability of end-cell voltage of the battery
- Choice between Various Harmonic Filters
- 6/12 Pulse Rectifier
- Standard dry contacts
- Servo Controlled Voltage Stabilize (SCVS) in bypass line
- Static Voltage Regulator (SVR)
- V-Connected Transformers.
- Fault Diagnostics Unit
- AC Distribution Board
- Load Bus Synchronization
- Input Isolation Transformer
  - Compatible with Liebert® AF, the Active Harmonic Filter
  - Available for rectifier and I or bypass supply
- TVSS (Transient Voltage Surge Suppressor)
  - This offers protection from damaging transients and electrical line noises
- Liebert<sup>®</sup> Static Transfer Switch
  - This allows critical load to be transferred between two independent, synchronized AC power sources without any risk of load disturbances
  - This allows automatic transfer of load between the two sources

## **Meeting Protection Needs**

- Temperature-compensated battery charging (Optional)
- Common battery sharing / battery circuit breaker
- Short-circuit proof inverter
- Input Harmonic Filter (HF)
- Protection against deep discharge of battery
- Auto online battery testing
- Battery earth fault kit
- Back-feed protection

### **Power Communication Options**

When choosing the best system to protect your mission critical applications, an important consideration would be the software and communication options. As part of our commitment to provide the best solution for you, we offer a wide range of sophisticated software and communication options for Liebert<sup>®</sup> Hipulse-S.

### **Communications Options**

- Fault diagnostics unit
  - to meet the needs of continuous supervision of UPS operation, data logging on a work station.
- Relay contact card
  - addresses the basic monitoring and communications needs of users /maintenance personnel.

### Other remote communications

- The Liebert<sup>®</sup> Hipulse-S provides other communications alternatives through RS-232 & RS-485 ports.
- In addition to FDU, service personnel can also use the RS-232 port for local downloading of data, building management systems Via ModBus protocols while the RS-485 port can be utilized for a variety remote communications application.

## Open Comms<sup>™</sup> WebCard\*

• to meet the needs of network managers by providing interface to network management systems through SNMP/HTTP protocols and control through building management systems via Modbus and bus Protocols.

## Local communications

 Liebert<sup>®</sup> Hipulse-S provides excellent local communications through its LED-based mimic diagram and LCD panel. While the mimic shows the live power path, the back-lit contrast adjusting LCD provides you with detailed data on the unit and the system in twelve different languages through a userfriendly menu.

### Liebert<sup>®</sup> Power Monitoring Capabilities:

- Multilink™ automated system shutdown software
- Fault diagnostics unit. Site Scan<sup>™</sup> web comprehensive
- Remote alarm monitoring box



# Comprehensive Display panel has three distinct functional sections to your Advantage

- Mimic: this section incorporates LEDs. Which indicate current operational status of the UPS System (i.e.the path of powerflow) very clearly.
- Controls: Touch membrane switches on the front panel enable the inverter to be switched ON and OFF audible alarm RESET and allow all Output & Battery parameters to be selected for indication. In addition emergency STOP Button is provided as well.
- **Display:** 4 x 20 Line f 80 characters LCD Display indicates operating parameters and all alarm conditions automatically.

\*Condition Apply



Nemian anting LVA1 (0.0)26404050100	Hipulse-S 1ph (110 Vac) UPS system												
00 'PotagoInto X - V - SU - SU		25	40	50	60	70	80	90	105	130	150	160	200
Total contraction of the contract	kW at 0.8 P.F. to unity P.F.	20	32	40	48	56	64	72	84	104	120	128	160
Physical Characteriation   Unit	O/P Voltage					110 Va	c (+/-5% V	Vindow se	ettable)				
Dep (nm)895	Rectifier type	6p/12p											
With (nam)9009001200120012001200120012002100<	Physical Characteristics												
Height (nm)210 </td <td>Depth (mm)</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>895</td> <td>1000</td> <td>1025</td> <td>1055</td>	Depth (mm)	895	895	895	895	895	895	895	895	895	1000	1025	1055
	Width (mm)	900	900	1250	1250	1250	1250	1640	1640	1640	2000	1640	2830
Construction     IP 31standard (optionality 32/RP4/I/P42)       Degree of Protection for Enclosure     IP 31standard (optionality 32/RP4/I/P42)       Ventilación     Air forced coling with integral fans       Cable Entry     Bottom       Progenory     Bottom       Power Factor     QB on 60Hz #/5%   5%   3 ph-3wire       Power Factor     QB - 400 / 45 / (-15 %   5%   3 ph-3wire       Power Factor     QB - 400 / 45 / (-15 %   5%   3 ph-3wire       Power Factor     QB - 400 / 45 / (-15 %   5%   3 ph-3wire       Power Factor     QB - 400 / 45 / (-15 %   100 / 4c - 10 / 100	Height (mm)	2110	2110	2110	2110	2110	2110	2100	2100	2100	2300	2312	2212
Degree of Protection for EnclosureIP 31standard (captionalBP 32/IP4/I)P42)VanitationAir forced cooling with integral fansCable EnripBittomCable EnripBittomCable EnripBittomImpact380 / 400 / 415 / (-15% / 157) 3 ph-3wirePrequency380 / 400 / 415 / (-15% / 157) 3 ph-3wirePower Factor00% soft or /-5%Power Factor50HzPower Factor84 //306 V //03 200/04/15 Vac input)Battery AvailabilyNick Of Word S00 //03 200/04/15 Vac input)Power Factor10% cond S00 //03 200/04/15 Vac input)Power Factor10% cond S00 //03 200/04/15 Vac input)Power Factor20%Power Factor20% <td>Weight (kg)</td> <td>525</td> <td>650</td> <td>700</td> <td>750</td> <td>1150</td> <td>1250</td> <td>1650</td> <td>1750</td> <td>1850</td> <td>2450</td> <td>2550</td> <td>3000</td>	Weight (kg)	525	650	700	750	1150	1250	1650	1750	1850	2450	2550	3000
VertilationAir forced cooing with integral fansCabine FirshichBottomCabine FirshichRAL 7021 structured black (other color shades valiable on demand) <b>Input</b> 380 / 400 / 415 / (15% / 15%) 3 ph. 3wireVotage380 / 400 / 415 / (15% / 15%) 3 ph. 3wireFrequency380 / 400 / 415 / (15% / 15%) 3 ph. 3wireFrequency380 / 400 / 415 / (15% / 15%) 3 ph. 3wirePower Factor0.8: 938 with optional input filter @Power Factor0.8: 938 with optional input filter @Power Factor100 VacInput Voltage Variation4.10%Power Factor0.8: 938 with optional input filter @Power Factor0.8: 938 without battery /1% with batteryDC Ropie<7.2% without battery /1% with battery	Construction												
Cable Entry     Battom       Cable Entry     RAL 7021 structured block (other color shades available on demand)       Input     Structured block (other color shades available on demand)       Voltage     380 / 400 / 415 / (415K / 15K3) 3 ph Sulver       Frequency     380 / 400 / 415 / (415K / 15K3) 3 ph Sulver       Frequency     380 / 400 / 415 / (415K / 15K3) 3 ph Sulver       Frequency     0.08-058 with optional input filter @       Prover Factor     0.08-058 with optional input filter @       Voltage Variation     10 Vac       Input Voltage Variation     10 Vac       Prequency     50 Hz       Contermodiate Circuit     Contermodiate Circuit       DC Ropin     < 2% without battery /1% with hattery	Degree of Protection for Enclosure	IP 31standard (optional:IP 32/IP41/IP42)											
Cabinet FinishRAI 7021 structured black (other color shades available on demand)InputVoltage380 / 400 / 415 / 415 // 155/ 3 ph.3wireFrequency380 / 400 / 415 // 415 // 155/ 3 ph.3wireFrequency300 or 60Hz = /.5%Probl00% with optional input filter@Prosen00% with optional input filter@Prosen00% with optional input filter@Propose00% or 60Hz = /.5%Proquency010 VacProquency050HzDC Roppie< 2% without battery /1% with batteryDC Roppie< 2% without battery /1% with batteryDC Normal Voltage384 V /386 V /.068 V /663 80/.400 //15 Vac input)Battery AvailabilityNie Cd / Vet Add / VRLA 2/ SMF 12VOutage110Vac - 1phVoltage Stability Steady State00% Color 300 //15 Vac input)Otage Stability Steady State01% Color 300 //15 Vac input)Voltage Stability Steady State01% Color 300 //15 V	Ventilation	Air forced cooling with integral fans											
Input       Valtage     380 / 400 / 415 / (+15% / -15%) 3 ph-3wire       Frequency     50 or 601/z -/5%       THDI     00% with optional input filter @       Power Factor     0.8-038 with optional input filter @       Dower Factor     0.8-038 with optional input filter @       Power Factor     0.8-038 with optional input filter @       Dower Factor     0.8-038 with optional input	Cable Entry	Bottom											
Vistage380 / 400 / 415 / (+15% / 15%) 3 ph -3wireFrequency50 or 60Hz -/-5%THD10% with optional input filter @Power Factor0.8-0.95 with optional input filter @Power Factor0.8-0.95 with optional input filter @Power Factor10 VacInput Voltage Variation10 VacInput Voltage Variation10 VacPrequency50HzContradiate Grout20 March 200 Ma	Cabinet Finish	RAL 7021 structured black (other color shades available on demand)											
FrequencyS0 or 60Hz +/5%THDI10% with optional input filter@Power Factor0.8-0.95 with optional input filter@Power Factor0.8-0.95 with optional input filter@Power110 VacInput Voltage Variation+/-10%Frequency0.9HzDC Ropile< = 2% without battery /1% with battery	Input												
TAD     10% with optional input filter @       Power Factor     0.8-0.95 with optional input filter @       Press     100 Vac       Strange     100 Vac       Input Voltage Variation     +'-10%       Frequency     50 Hz       DC Interneditat Circuit     -       DC Kominal Voltage     -       Voltage     -       Voltage     -       Voltage Stability Steady State     -       Voltage Stability Steady State     -       Voltage Distortion     -       Voltage Distortion Non-Linear Load     -       Frequency     SO or 60 Hz       Frequency     SO or 60 Hz	Voltage	380 / 400 / 415 / (+15% /-15%) 3 ph-3wlre											
Power Factor     0.8-0.95 with optional input filter@       Sysse       Voltage     10 Vac       Input Voltage Variation     10 Vac       Input Voltage Variation     6.0// 10 Vac       Prequency     5.0// 2       D Commonitat Circuit     Commonitation       DC Nominal Voltage     384 V/385 V /408 V (for 380/400/415 Vac input)       Battery Availability	Frequency	50 or 60Hz =/-5%											
Pypass     Control       Voltage     10 Vac       Input Voltage Variation     +/-10%       Frequency     50Hz       DC Intermediate Circuit        DC Ripple     <= 2% without battery /1% with battery	THDI	10% with optional input filter @											
Votage10 VacInput Votage Variation10 VacInput Votage Variation50 HzFrequency50 HzD C Instrmediate Circuit< < 2% without battery /1% with battery	Power Factor	0.8-0.95 with optional input filter@											
Input Voltage Variation     +/-10%       Frequency     50Hz       DC Intermodiate Circuit        DC Ripple     < = 2% without battery /1% with battery	Bypass												
Frequency     50Hz       DC Intermediate Circuit     C       DC Ripple     < = 2% without battery /1% with battery	Voltage	110 Vac											
De Intermediate Circuit       DC Ripple     < = 2% without battery /1% with battery	Input Voltage Variation	+/-10%											
DR Ripple   < = 2% without battery /1% with battery	Frequency						50	Hz					
DC Nominal Voltage     384 V /396 V /408 V (For 380/400/415 Vac input)       Battery Availability     Ni-Cd / Wet-Add / VRLA 2V / SMF 12V       Output     100Vac - 1ph       Voltage Stability Steady State     100Vac - 1ph       100% Load Step     +/-5%       Recovery Time (to within 1% nominal)     200ms       Voltage Distortion     <<20ms													
Battery Availability Ni-Cd / Wet-Add / VRLA 2V / SMF 12V   Output   Voltage 110Vac - 1ph   Voltage Stability Steady State +/-15%   Recovery Time (to within 1% nominal)    Ovltage Distortion <-20ms   Voltage Distortion Non-Linear Load (31 Crest Factor)    Frequency 50 or 60 Hz   Frequency Stability Synchronized with the Bypass Supply +/- 1Hz   Auto-Synchronised +/- 01%   Overlad Capacity from Inverter at Nominal Voltage 110% for 60 mins.,125% for 1 min.   Short circuit current from Inverter 15 in 5 seconds (in accordance with EN 50091-11)   Environment 0 to 45°C**   Operating Temperature 0 to 45°C**   Storage Temperature 0 to 45°C**   Relive Humidity 90% non-condensing type at 31°C   Murrent Storage Attributed Without Dereting 1000 meters from MSL													
Output       Voltage     10Vac - 1ph       Voltage Stability Steady State     +/-15%       100% Load Step     +/-5%       Recovery Time (to within 1% nominal)     <20ms	-	384 V /396 V /408 V (For 380/400/415 Vac input)											
Voltage     110Vac - 1ph       Voltage Stability Steady State     110/4 c - 1ph       Voltage Stability Steady State     +/-15%       100% Load Step     +/-5%       Recovery Time (to within 1% nominal)        Voltage Distortion     <-20ms						Ni-Cd / W	/et-Add / '	VRLA 2V	/ SMF 12V	/			
Voltage Stability Steady State+/-1.5%100% Load Step+/-1.5%Recovery Time (to within 1% nominal)<20ms													
100% Load Step+/-5%Recovery Time (to within 1% nominal)<20ms	-												
Recovery Time (to within 1% nominal)-20msVoltage Distortion<=2%													
Voltage Distortion<=2%Voltage Distortion Non-Linear Load (31 Crest Factor)<=5%													
Vate Outside Distortion Non-Linear Load (31 Crest Factor)<Frequency50 or 60 HzFrequency Stability Synchronized with the Bypass Supply+/- 1HzAuto-Synchronised+/- 0.1%Overload Capacity from Inverter at Nominal Voltage110% for 60 mins.,125% for 10 mins.,135-150% for 1 min.Short circuit current from inverter15 in 5 seconds (in accordance with EN 50091-1-1)Environment0 to 45°C**OperatingTemperature0 to 45°C**Storage Temperature90% non-condensing type at 31°CRelative Humidity90% non-condensing type at 31°CMaximu Operating Altitude without Derating1000 meters from MSL													
Frequency   50 or 60 Hz     Frequency Stability Synchronized with the Bypass Supply   +/- 1Hz     Auto-Synchronised   +/- 0.1%     Overload Capacity from Inverter at Nominal Voltage   110% for 60 mins.,125% for 10 mins.,135-150% for 1 min.     Short circuit current from inverter   1.5 in 5 seconds (in accordance with EN 50091-1-1)     Environment   0 to 45°C**     Operating Temperature   0 to 45°C**     Storage Temperature   90% non-condensing type at 31°C     Maximum Operating Altitude without Derating   1000 meters from MSL	Voltage Distortion Non-Linear Load												
Frequency Stability Synchronized with the Bypass Supply+/- 1HzAuto-Synchronised+/- 01%Auto-Synchronised110% for 60 mins,125% for 10 mins,135-150% for 1 min.Overload Capacity from Inverter at Nominal Voltage110% for 60 mins,125% for 10 mins,135-150% for 1 min.Short circuit current from inverter1.5 in 5 seconds (in accordance with EN 50091-1-1)Environment0 to 45°C**Operating Temperature0 to 45°C**Storage Temperature90% non-condensing type at 31°CMaximum Operating Altitude without Derating1000 meters from MSL													
Auto-Synchronised+/- 0.1%Overload Capacity from Inverter at Nominal Voltage110% for 60 mins.,125% for 10 mins.,135-150% for 1 min.Short circuit current from inverter1.5 in 5 seconds (in accordance with EN 50091-1-1)EnvironmentOperatingTemperature0 to 45°C**Storage Temperature-25°C to 70°CRelative Humidity90% non-condensing type at 31°CMaximum Operating Altitude without Derating1000 meters from MSL	Frequency Stability Synchronized with												
Overload Capacity from Inverter at Nominal Voltage110% for 60 mins,125% for 10 mins,135-150% for 1 min.Short circuit current from inverter1.5 in 5 seconds (in accordance with EN 50091-1-1)EnvironmentOperatingTemperature0 to 45°C**Storage Temperature-25°C to 70°CRelative Humidity90% non-condensing type at 31°CMaximum Operating Altitude without Derating1000 meters from MSL		+/- 01%											
Short circuit current from inverter1.5 in 5 seconds (in accordance with EN 50091-1-1)EnvironmentOperatingTemperature0 to 45°C**Storage Temperature-25°C to 70°CRelative Humidity90% non-condensing type at 31°CMaximum Operating Altitude without Derating1000 meters from MSL													
Environment     OperatingTemperature   0 to 45°C**     Storage Temperature   -25°C to 70°C     Relative Humidity   90% non-condensing type at 31°C     Maximum Operating Altitude without Derating   1000 meters from MSL													
OperatingTemperature0 to 45°C**Storage Temperature-25°C to 70°CRelative Humidity90% non-condensing type at 31°CMaximum Operating Altitude without Derating1000 meters from MSL													
Storage Temperature -25°C to 70°C   Relative Humidity 90% non-condensing type at 31°C   Maximum Operating Altitude without Derating 1000 meters from MSL							0 to 4	45°C**					
Relative Humidity 90% non-condensing type at 31°C   Maximum Operating Altitude without Derating 1000 meters from MSL		-25°C to 70°C											
		90% non-condensing type at 31°C											
Acoustic Noise at 1 Meter from Panel Front 57 to 73 dBA (depending on the kVA rating)	Maximum Operating Altitude without Derating	1000 meters from MSL											
	Acoustic Noise at 1 Meter from Panel Front	57 to 73 dBA (depending on the kVA rating)											

## LIEBERT® HIPULSE-S

Hipulse-S 1ph (230 Vac) UPS system												
Nominal Rating [kVA] (0.8)	25	40	50	60	70	80	90	105	130	150	160	200
kW at 0.8 P.F. to unity P.F.	20	32	40	48	56	64	72	84	104	120	128	160
O/P Voltage	20	02	10	10					101	120	120	100
Rectifier Type	230 Vac (+/-5% Window settable) 6p/12p											
Physical Characteristics						op	120					
Depth (mm)	895	895	895	895	895	895	895	895	895	895	1025	1055
Width (mm)	900	900	1250	1250	1250	1250	1640	1640	1640	1640	1640	2830
Height (mm)	2110	2110	2110	2110	2110	2110	2110	2110	2110	2110	2312	2212
Weight (kg)	475	600	650	700	1200	1200	1700	1700	1800	1900	2550	3000
Construction												
Degree of Protection for Enclosure	_	_	_	IF	P31 Standa	ard (optio	nal: IP32 /	IP41 / IP4	2)	_	_	
Ventilation	IP31 Standard (optional: IP32 / IP41 / IP42) Air forced cooling with integral fans											
Cable Entry	Bottom											
Cabinet Finish	RAL 7021 structured black (other color shades available on demand)											
Input												
Voltage				3	80 / 400 /	/ 415 / (+1	5% / -15%)	3 ph- 3wi	ire			
Frequency	50 or 60Hz +/-5%											
THDI	10% with optional input filter@											
Power Factor	0.8-0.95 with optional input filter®											
Bypass												
Voltage						230	)Vac					
Input Voltage Variation	+/-10%											
Frequency	50Hz											
DC Intermediate Circuit												
DC Ripple					< = 2% wit	thout batt	ery / 1%w	ith battery	4			
DC Nominal Voltage				384 V	/ 396 V /	408 v (Fo	or 380/40	0/415 Vac	input)			
Battery Availability					Ni-Cd / W	/et-Acid /	VRLA 2V	/ SMF 12 v	/			
Output												
Voltage						230Va	ac - 1ph					
Voltage Stability Steady State						+/	-1%					
100% Load Step						+/	-5%					
Recovery Time (to within 1% nominal)						<20	Oms					
Voltage Distortion						<=	2%					
Voltage Distortion Non-Linear Load (3:1 Crest Factor)	<=5%											
Frequency						50 or	60Hz					
Frequency Stability Synchronized with the Bypass Supply						+/-	1Hz					
Auto-Synchronised						+/-	0.1%					
Overload Capacity from Inverter at Nominal Voltage	110% for 60 mins., 125% for 10 mins., 135-150% for 1 min.											
Short circuit current from inverter				1.5 in §	5 seconds	(in accor	dance witl	n EN 5009	91- 1 -1)			
Environment												
OperatingTemperature						O to 4	45°C**					
Storage Temperature	-25°C to 70°C											
Relative Humidity	90% non-condensing type at 31°C											
Maximum Operating Altitude without Derating	1000 meters from MSL											
Acoustic Noise at 1 Meter from Panel Front	57 to 73 dBA (depending on the kVA rating)											





#### VertivCo.com

© 2016 Vertiv Co. All rights reserved. Vertiv and the Vertiv logo are trademarks of registered trademarks of Vertiv Co. All other names and logos referred to are trade names, trademarks or registered trademarks of their respective owners. While every precaution has been taken to ensure accuracy and completeness herein, Vertiv Co. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications are subject to change without notice.