HUSSMAnn[®]

CoreLink[™]

Case Controller

for use with Hussmann Modular Coils and Low Temperature Applications



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CoreLink [™]	7	CoreLink [™]
D20 HUSSMANN'	HSVI	D30 HUSSMANN



MANUAL- CORELINK CASE CONTROLLER

Installation & Operation Manual

P/N 0557046_A September 2016





BEFORE YOU BEGIN

Read these instructions completely and carefully.



PERSONAL PROTECTION EQUIPMENT (PPE)

Personal Protection Equipment (PPE) is required whenever servicing refrigeration equipment. Always wear safety glasses, gloves, protective boots or shoes, long pants, and a long-sleeve shirt when working with this equipment.







Electrostatic Discharge (ESD)

Hussmann recommends industry workers use antistatic wrist straps, wrist strap, or ground bracelet when working on electronic devices, which can be damaged by Electrostatic Discharge.

Go to Web User Interface - System Tab to confirm software version.

Bios Version: 2015061500 Web UI Version: 0.3.13 Application Version: 1.2.9 Application Date Code: 61716

Hussmann reserves the right to change or revise specifications and product design in connection with any feature of our products. Such changes do not entitle the buyer to corresponding changes, improvements, additions or replacements for equipment previously sold or shipped.

Made in ITALY	8D K4JCAOB300 000#0010000 ENXXXXX X X	X-X R.H. 20∻85% V 0.0
CE 🕱	c 91 us	
Power 40VA Max Power Supply 24V ∺ T -10+60 °C	HUSSMANN C	ODE AREA
51 -10⊶50 °Č Ser. Port: LAN		

REVISION HISTORY

ORIGINAL ISSUE — September 2016

ANSI Z535.5 DEFINITIONS



• **DANGER** – Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.



• WARNING – Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.



• CAUTION – Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

• **NOTICE** – Not related to personal injury – Indicates[s] situations, which if not avoided, could result in damage to equipment.

INTRODUCTION

The installation and operation manual format is designed to provide quick resolution to common questions about CoreLink setup and operation.

Please take a moment familiarize yourself with the manual format. Each section is concentrated specifically on the topic and contains unique information and helpful/safety features associated with that section. Users do not have to search around the manual for broken up information in order to gain understanding. Sometimes similar information is repeated in multiple sections.

Controller Features (Overview) Mechanical Installation Specifications Electrical Connections Web User Interface Application Parameters Alarms Regulatory Compliance Warranty Information

User Interfaces of CoreLink provide multi level access to the users. The user access is designed to prevent inexperienced personnel from accessing and adjusting higher levels of controls. Typical store users do not need or want full access to all controller parameters. CoreLink is designed for simplicity with the following levels listed below. User should determine which user levels access is most appropriate for their level of experience when using the interface.

Web User Interface Level 1 – Store User Access Level 2 – Service Technician

Hussmann recommends Service Technican users connect to the Web UI interface when available.

The Web UI is the fastest path to learning about features that CoreLink offers. The Users can navigate the Web UI easily because it communicates the setting without having to continually reference the manual.

IMPORTANT KEEP IN STORE FOR FUTURE REFERENCE Quality that sets industry standards!

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CoreLink[™] Case Controller

TABLE OF CONTENTS

Safety		•	•	•	•	•			•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	ii
Disclaimer	 •	•	•	•	•	•	 •	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	11
Revision History														•									•	•	•	ii
ANSI Definitions																										.ii
Introduction					•							•	•	•	•	•	•	•	•				•	•		iii

CONTROLLER FEATURES

Hardware / Configurable I/O	1-1
Network	1-1
Available Extension Modules	1-2
Modular Coils	1-2
Application	1-2
PÎD Control	1-2
Pressure Sharing	1-3
Internal Web Server	1-3
Data Logging	1-3
Factory Restore	1-3
Save/Load Feature	1-3
Standalone Operation	1-3

MECHANICAL INSTALLATION

Warnings	2-1
Tools Required	2-2
Materials Required and Sensor Mounting	2-2
Device Dimensions	2-3
Docking Devices	2-4
Mounting Devices without DIN rail	2-4
Controller Enclosure	2-5

SPECIFICATIONS

Warnings
Electrical / Mechanical Specifications
Digital Input / Output
Analog Input
Analog Output
Input Descriptions
HŜVD20 - 2 Valve Driver
HSVD30 - 3 Valve Driver
HSVD - 1, 2 & 3 Valve Driver

ELECTRICAL

Warnings 4-1
Basic Connections 4-2
Possible Configurations 4-7
Valve Driver Communication
EEV Valve Wiring 4-12
HSVD30 Full Setup 4-13
HSVD30 3-Valve
HSVD30 2-Valve 4-15
HSVD30 1-Valve 4-16
HSVD20 Full Setup 4-17
HSVD20 1 Valve Low Temp
HSVD20 2 Valve
HSVD30 1 Valve Low Temp 4-20

CORELINK WEB USER INTERFACE

Description of CoreLink User Interface	5-1
Adjusting Network Settings	5-2
CoreLink Default IP Settings	5-2
Accessing CoreLink Case Controller	5-3
Common Problems	5-3

APPLICATION

Warnings	6-1
Refrigeration Principle Operation	6-2
Multi-Circuit Valve Driver	6-2
Refrigeration	6-3
Door Operation	6-6
Clean Switch Operation	6-6
Clean Mode	6-7
Superheat	6-7
Auto Adaptive Mode	6-8
Super Heat Alarm	6-9
Defrost	6-10
Fans	6-11
Anti-Sweat Control	6-12
Valve Selection	6-13
Valve Type	6-13
Valve Parameters	6-14

PARAMETERS

Refrigeration Menu	8-1
Superheat Menu	8-2
Defrost Menu	8-4
Fans Menu	8-5
Light Menu	8-6
Stepper Valves	8-7
Pressure and Temp. Sensor	8-8

ALARMS

Case Alarm																				(9-1
Case Alarm Settings	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	(9-2

REGULATORY COMPLIANCE

Compliance and	Contact Info		10-1
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P/N 0557046_A

CONTROLLER FEATURES

- CoreLink is a customizable, programmable controller that can interface with I/O expansions, drivers for electronic valves and graphical interfaces adapted to specifically work with refrigeration and cooling equipment.
- CoreLink controllers are powered by 24Vac/dc and use a high-speeed performance 32-bit ARM9 (200 MHz) microprocessor.
- One of the features that distinguishes the Core-Link controller is the vast range of expansion options with external devices including Dixell as well as other brands.
- > All the inputs and outputs are fully configurable.
- The program and parameters are stored in a permanent flash memory. No data is lost in case of power failure.
- Internal web server graphical interface with the CoreLink website

HARDWARE:

- > USB Port (Ethernet Adaptor Ready)
- > Hussmann LCD Remote Display
- > Serial Port (LAN) Communication
- ► RS485

CONFIGURABLE I/O:

- > (x11) Digital Inputs
- > (x8) Relay Outputs [Digital Out]
- ► (x6) Analog Input
- ► (x4) Analog Output
- Additional Power (Accessories)
- > 12 VDC 200ma MAX
- > 5 VDC 100ma MAX

NETWORK

- USB port provide maximum flexibility of integration with the outside world.
- MODBUS RTU protocol used with Refrigeration and all other building automation systems
- > Application Flashing via USB Stick
- Firmware upgrades and configuration changes via the USB port
- USB to Ethernet Adaptors can be used to connect CoreLink onto a local area network. Through the addition of a mini router, users have wireless connection to Phone, Tablet and Laptop devices.
- Wireless connection is particularly useful for service technicians. Technicians can force command controller functions and watch inputs/outputs from their personal smart devices.
- This provides flexibility when troubleshooting in the field. Technicians are not linked to long cables while working in large areas.
- > Technicians can review controller operation remotely in the back room.
- > Default Controller IP: 192.168.0.250
- Note: Refer to Web UI Section for first time connection

.

1-2

NETWORK (Continued) Serial Port (LAN Connection)

CoreLink can connect to external peripherals through the LAN serial port and easily allow expansion to additional control devices.

Optional Hussmann Remote Display: A small surface mount display is available for customers that want direct control at the case level.

AVAILABLE EXTENSION MODULES

Modular Case Valve Drivers (Hussmann Stepper Valve Driver) = HSVD

HSVD is Hussmann solution to address controlling cases with multiple coils.

HSVD can control Uni-Polar and Bi-Polar valves and is not limited to one stepper valve type.

Available Drivers: HSVD20 – Dual Valve Driver HSVD30 – Triple Valve Driver

MODULAR COILS

Hussmann medium temperature, multi-deck display cases generally include one modular evaporator coil in each 4-foot section. Thus, there are 3 modular coils in a 12-foot case, and two in an 8-foot case.

Hussmann's CoreLink Case Controller system was designed to allow a single controller and a single valve driver to manage up to three Electronic Expansion Valves (EEV) in a single case.

The control algorithms were designed to provide tighter temperature control and improved energy efficiency, further improving performance advantages of modular coils.

APPLICATION

The application will have the option to support up to three coils by regulating superheat in addition to optimim case temperature. To maintain case temperature, the application will use discharge case temperature, return case temperature or a mixed combination of discharge and return temperatures.

PID CONTROL

Auto – Controller automatically calculates ideal PID settings for best case performance. Manual – User adjusted PID settings

3 Available Control Modes:

Superheat Only

 Remote type cases with temperatures regulated by pressure. User decides target.

Standard Mode

 Controller can support all self-contained operation including condenser unit.

Continuous Mode

 Remote type cases with temperature regulated by combination superheat control and air discharge algorithm.

PRESSURE SHARING

Only a single pressure transducer is required for all superheat calculations. This saves on installation and cost.

The controller can support use of up to 3 pressure transducers for independent superheat control across a maximum three coils.

Hussmann supports most major stepper valves. Consult your Hussmann Representative for specific recommendations.

INTERNAL WEB SERVER

The CoreLink case controller features a friendly user interface that can be accessed by web browser.

This Web UI can be accessed by in store network via windows computer or with a wireless link device that can be viewed by technician through smart phone devices.

DATA LOGGING

The case control application has internal logging for each along with critical operation data. Data is available for local download.

- > 2-minute intervals
- > 14-day capacity
- > Advanced analytics Web User Interface
- > CSV format with 15 critical data points

Onboard data logging allows users to review performance data from the past week. User can see Min/ Max/Average data along with saving data sets and importing data sets for view.

FACTORY RESTORE

The CoreLink application has a configuration file with the complete with the complete and optimized default case settings.

Anytime a user wants to default to factory settings they can simply access the user interface and force a factory reset.

SAVE/LOAD FEATURE

The CoreLink Case Controller is setup from the factory with a specific product configuration when a customer purchases a display case.

This specific configuration is hard-coded into the controller and is the factory default file.

Also included are three user presets that a user can save or load custom configuration settings. These settings allow customers to make small tweaks in the field that can improve performance or target temperatures.

STANDALONE OPERATION

Controller is configured from the factory to run as a standalone controller. Field network integrations are done to provide additional capabilities to the controller. In case of network failure of BAS managing additional control functions, controller will default to its standalone settings and regulate display case until network connection is restored.

In case of network failure to building automation system managing case setpoints, the controller will default to program settings in internal memory and continue to regulate display case until network connection is restored. 1-4

NOTES:

MECHANICAL INSTALLATION

A WARNING

All operations and installations should be carried out by qualified personnel only.

For safety purposes, always make sure the device is switched OFF before touching connections.

All system components should be obtained from Hussmann to ensure system compatibility and reliability.

Under no circumstances is the device to be opened – Opening the case on the device will void the warranty.

Prevent the device from being dropped, knocked or shaken as this can cause irreparable damage.

The device must always be inserted inside an electrical panel that can be accessed by authorized personnel only.

Comply with the temperature and humidity limits specified in the manual . Prevent frequent and sudden changes in temperature and/or humidity.

Do not mount devices in extremely damp and/or dirt-laden areas; Electronics should never come in contact with water or any other type of liquid. Do not install device in area of high mechanical stress vibrations. Harsh vibrations can cause component level failure or unintended disconnection of controller cables.

Do not clean the device with corrosive chemical products, solvents or aggressive detergents. The device must not be used in applications that differ from that specified in the following material.

Do not install the device in the presence of flammable or explosive gas. Device is not ignition protected for application in flammable environments.

Do not expose device to Sulphur and Ammonia gas, smoke and salt spray that can cause corrosion and/or oxidation.

Do not install device near items that generate large amounts of magnetic interference. Abnormal operation can result.

Always make sure the area near the cooling slot is ventilated and that the controllers always receive sufficient passage for cooling air.

Always comply with the laws and regulations applicable in the country where the device is installed. Always protect and stow the device securely so it can only be accessed by authorized personnel. In case of malfunctions, always contact the relative distributor for the device to be repaired.

TOOLS REQUIRED:

- Small Flat Screwdriver for Terminal Connections
- Regular Screwdriver
- Philips Screwdriver
- Cordless Drill
- Wire Cutters
- Needle-Nose Pliers
- Mini Diagonal Cutters
- Drill Bit Set
- Multi-Meter
- Hex Head Screw Sockets
- Tape Measure
- Pencil/Marker
- Anti-Static Wrist Strap
- Flashlight
- Safety Glasses
- Safety Gloves

MATERIALS REQUIRED:

- Screws for Wall Mounting #6, #8
- 18 AWG Twisted Pair Network Cable
 - Belden 8760 2-wire Shield 18 AWG
 - Belden 8770 3-wire Shield 18 AWG
- Wago Nut Connector or Wire-Nut
- Spade Terminal Connectors
- Ethernet Cable (Not Provided)
- USB to Ethernet Cable (Not Provided)
- DIN Rail

NOTE: Temperature sensors may be extended 20ft. (6.1 m) to a maximum 40ft (12.2 m) using 18 gauge shielded twisted pair cable. (Beldon 8760, 8770, or equivalent)



SENSOR MOUNTING

- Accuracy of case controller performance will be determine by sensor placement/location.
- Please reference images below for recommended placement of temperature sensors attached to copper tube.





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Device Dimensions

4 DIN Devices

- Corelink Controller
- HSVD20 Double Valve Driver

4 DIN Devices

10 DIN Devices

• HSVD30 – Triple Valve Driver



10 DIN Devices



DOCKING DEVICES -35-mm Top Hat Section DIN rail

Then align the controller to the DIN rail and snap into position. Use release tabs to remove devices, lifting up and rotating out of DIN rail track.

MOUNTING DEVICES WITHOUT DIN RAIL

Place controller in desired location with all the mounting tabs extended. Transfer mounting holes to panel with a pencil/pen.

Remove device and pre-drill transfer marks.

P/N 0557046_A

Use a screw driver to mount controller over predrilled holes. DO NOT overtighten.







CONTROLLER ENCLOSURE



CoreLink controllers are factory installed in the enclosure or in the electrical wireway of a refrigerated display case.

Hussmann recommends top mounting of case controller enclosure.

Advantages:

- Low Humidity
- Low Dust / Dirt
- > Better Power Availability
- > Availability of Space
- Convenience
- Less exposure to chemical products, solvents or aggressive detergents.
- Good Ventilation

Check the cases' wireway or electrical box for CoreLink OEM mounts. Lower mounting is also available, but fewer advantages.

- Enclosure competes for space and is surrounded by plumbing.
- > Plumbing might need to be removed for servicing
- > Damp Environment
- Potential exposure to chemical cleaning products from cleaning store floors.
- > Higher potential for dust build up
- > Less available ventilation
- Potential leaks from case could find its way into the enclosure.



NOTICE

Do not install device near items that generate large amounts of magnetic interference. Abnormal operation can result.

Hussmann recommends CoreLink devices should be installed in a manner shown in the diagram at left.

All valve drivers and future expandable modules are low voltage devices. Placement in the box needs to be farthest away from high voltage power supplies.

CoreLink case controller has onboard relays that can support higher voltage. This is why Hussmann recommends the CoreLink Case Controller be placed in between the other devices as a barrier.

Placement in a Hussmann recommended enclosure following this drawing will allow all high voltage wire coming into and out of the enclosure to be concentrated in the corner of the enclosure, limiting proximity to lower voltage devices and cables.

User should practice best cable management by ensuring that high voltage wires are not wrapped around devices or running along low voltage cable.

Following Hussmann best practices will ensure optimal performance and extended component life.

Higher Temp

r Distribute Higher temperature components from Lower Temperature

SPECIFICATIONS

A WARNING

Be aware of the current limits for the power output devices. Additional power outputs are available on the CoreLink case controller and valve drivers.

Please pay extra attention to the current limits when applying power accessories. Avoid overloading the devices.

Hussmann is not responsible for misuse of device. Hussmann is not held responsible for deviation from this manual and its intended use. If you have any questions, please contact your local Hussmann branch.

When utilizing the digital inputs of the CoreLink Case Controller, use another transformer in order to prevent the digital inputs from malfunctioning or being damaged.

WARNING!

DO NOT use the same secondary of the controller's power. Doing so can result in damage to case controller.

Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer.

DO NOT exceed the maximum current capacity of the onboard controller relays.

Always verify the capacity of the output used.

DO NOT use different voltages for the various groups of relays nor within each group.

Digital Output (RELAYS) have two separate groups with separate commons. Please refer to the wiring diagrams on the Web UI or within this manual for more details. Electrical devices that are controller by the analog outputs must be powered separately with another transformer. (Do not use the same secondary of the controller's power)

DO NOT plug in accessory devices that are not approved by Hussmann.

Permitted Use

- Food Display Merchandizers
- Coolers
- Self-Contained
- Remote Cases

Improper Use

- HVAC
- Unspecified Installation
- Deviation from established Legislation and Standards

USB WARNINGS!

USB port can support maximum 200mA.

DO NOT plug your smart device or tablet into the USB port of the controller. You cannot charge your personal devices from this port.

The CoreLink Case Controller can be connected to a computer via an external USB to ethernet adapter. This adapter is not set up for fixed or continuous connection. If the adaptor should be kept connected continuously, the room temperature must not exceed 50°C.

Electrical Specifications Power Supply 24Vac (+10/-15%) 50/60Hz 20 - 36Vdc Consumption 30VA (Vac) - 25W (Vdc) Connectors Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max) AT91SAM9260 32-bit 200Mhz Microprocessor Permanent FLASH memory 32MB, in 8-bit RAM 32MB, in 16 Internal clock Standard

Mechanical Specifications	
Mount	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Material	PC-ABS Thermoplastic
Self-extinguishing	V0 (UL94)
Comparative Tracking Index (CTI)	300V
Color	White
Operating temperature	-10÷60°C; Storage: -30÷85°C
Relative humidity	20÷85% (no condensing)

Digital Input

Туре	Opto-insulated live contact (24Vac/dc) External power 24 Vac/dc ±20%
Number of Inputs	11
Digital Input Detection Time	100ms (in any case it depends on the cycle time set by the user in the given application)
NOTICE See Specifications Warnings	Use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

Digital Output Туре..... Relays with NO contacts Number of Outputs 8 Type of output Relays with normally open contact (Configurable via software parameter) Maximum load..... 5A(250Vac) SPST 5(2)A NOTICE Verify the capacity of the output used. There See Specifications Warnings is double insulation between the digital outputs and the low voltage of the rest of the circuit. Do not use different voltages for the various groups of relays nor within each group.

Analog Input	
Analog Conversion Type	10-bit A/D converter
Number of Inputs	6
Type of Analog Input	NTC Dixell (-50T110°C; $10K\Omega \pm 1\%$ at 25°C) PTC Dixell (-55T115°C; $990\Omega \pm 1\%$ at 25°C) Digital input (potential free contact) Voltage: 0 - V, 0 - 5V, 0 - 10V (input resistance $3.7K\Omega$) Current: 0 - 20mA, 4 - 20mA (input resistance 100Ω)
Detection Time	100ms (in any case it depends on the cycle time set by the user in the given application)
Accuracy	NTC, PTC: ±1 0-1V: ±20mV 0-5V: ±100mV 0-10V:±200mV 2-20mA, 4-20mA: ±0.30mA
Additional Power	+12V: 200mA in total (between +12V and analogue outputs) +5v: 100mA
NOTICE See Specifications Warnings	Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

Analog Output	
Туре	Non opto-insulated internal power
Number of Inputs	4
Type of Analog Input Out4)	4 configurable outputs 0-10Vdc 4-20mA (Out1 -
Maximum Load	40mA (Out1 - Out4) max with configured out puts 0-10Vdc 400 Ω max with configured outputs 4-20mA 22 Ω per live analogue output
Accuracy	Out1 - Out4: ±2% full scale
Additional Power.	8bit
NOTICE See Specifications Warnings	The electrical devices controlled by these analogue outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.



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			Genera	I Application F	Format
CoreLink C	Lase Controller IO		Note: A	pplication cou	ıld vary
Input No.	Type of Input	Description	Low Temp	Med Temp	Cooler
1	Supply	Reference "-"/GND power (24Vac or 24Vdc)			
2	Pb1	Configurable analogue input 1 (NTC. 0 - 5V)	Discharge 1	Discharge 1	Discharge 1
3	Pb2	Configurable analogue input 2 (NTC. 0 - 5V)	Discharge i	Discharge 2	Discharge 2
4	Pb3	Configurable analogue input 3 (NTC. 0 - 5V)	+	Discharge 3	Discharge 3
5	+12V	Additional power +12Vdc		Discharge	Discharge
6	+5V	Additional power +5Vdc	-		
7	Out1	Analogue output 1 0 - 10V, 4 - 20mA, Relay	-		
8	Out2	Analogue output 2 0 - 10V, 4 - 20mA, Relay	-		
9	Supply	Reference "+" power supply (24Vac or 24Vdc)	-		
10	Pb4	Configurable analogue input 4 (NTC, 0 - 5V)	-		
11	Pb5	Configurable analogue input 5 (NTC, 0 - 5V)	-		
12	Pb6	Configurable analogue input 6 (NTC, 0 - 5V)	-		
13	PbC	Common analogue inputs (NTC, PTC, DI)	-		
14	GND(-)	Additional power reference 5Vdc and 12Vdc, analogue inputs (0 - 20mA, 4 -	-		
15	Out3	Analogue output 3 0 - 10V, 4 - 20mA, Relay	-		
16	Out4	Analogue output 4 0 - 10V, 4 - 20mA, Relay	-		
20	DI1	Digital input 1 24Vac/dc		Enabled	
21	DI2	Digital input 2 24Vac/dc	D	efrost Initializ	e
22	DI3	Digital input 3 24Vac/dc	D	efrost Termina	te
23	DI4	Digital input 4 24Vac/dc	+	Motion	
24	DI5	Digital input 5 24Vac/dc	1	Clean	
25	DI6	Digital input 6 24Vac/dc	1	Door	
26	DI7	Digital input 7 24Vac/dc	1	Dual Temp	
27	DI8	Digital input 8 24Vac/dc			
28	D19	Digital input 9 24Vac/dc			
29	DI10	Digital input 10 24Vac/dc			
30	DI11	Digital input 11 24Vac/dc			
31	GND(-)	Reference "-" for digital inputs from1 to 11 (if version with dry contacts, this input has to be used only as common for the digital inputs)			
40	С	Common relays 1, 2, 3 and 4 (MAX 10A)	115v Cor	nmon Input fo	r Relays
41	С	Common relays 1, 2, 3 and 4 (MAX 10A)	(RL)	I, RL2, RL3, F	RL4)
42	RL1	Relay 1 normally open contact		Fans	
43	RL2	Relay 2 normally open contact		Lights	
44	RL3	Relay 3 normally open contact		Defrost	
45	RL4	Relay 4 normally open contact		Refrig	
46	RL5	Relay 5 normally open contact	<u> </u>	Alarm	
47	C	Common relays 5, 6, 7 and 8 (MAX 10A)	115v Cor	nmon Input fo	r Relays
48	C	Common relays 5, 6, 7 and 8 (MAX 10A)	(RL	5, RL6, RL7, F	RL8)
49	RL6	Relay 6 normally open contact	<u> </u>	Aux 1	_
50	RL7	Relay 7 normally open contact	<u> </u>	Aux 2	
51	RL8	Relay 8 normally open contact		Aux 3	
60	Remote Display	Connection for VISOGRAPH remote terminal (Vnr)			
61	Remote Display	Connection for VISOGRAPH remote terminal (+)	E	xternal Display	у
62	Remote Display	Connection for VISOGRAPH remote terminal (-)			
63	RS485 Slave	RS485 Slave connection (-)		Modbus RS484	5
64	RS485 Slave	RS485 Slave connection (+)	-	100000 100 100	^
65	LAN	LAN Connection (-)	Valve	Driver Conne	citon
66	LAN	LAN Connection (+)	vaive	Since conno	

HSVD20 - 2 VALVE DRIVER



24Vac (+10/-15%) 50/60Hz 20 - 36Vdc

40VA (Vac) - 36W (Vdc)

Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)

Mechanical Specifications	
Mount	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Material	PC-ABS Thermoplastic
Self-extinguishing	V0 (UL94)
Comparative Tracking Index (CTI)	300V
Color	White
Operating temperature	-10÷60°C; Storage: -30÷85°C
Relative humidity	20÷85% (no condensing)

HSVD30 - 3 VALVE DRIVER

Electrical Specifications	
Power Supply	24Vac (+10/-15%) 50/60Hz 20 - 36Vdc
Consumption	60VA (Vac) - 54W (Vdc)
Connectors	Molex connectors with low voltage wiring (for IPS100D and IPS400D) Phoenix quick coupling connectors for low voltage (for IPS200D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)
VALVE1 VALVE2 VALVE3 5 1 3 2 4 5 1 3 2 4 5 1 3 2 +12V W1 W2 +12V W1 W2 +12V W1 W	Battery <u>+</u> <u>4</u> 17 18 2'
27 28 29 30 31 32 33 34 35 36 37 38 27 28 29 30 31 32 33 34 35 36 37 38 27 5 5 2 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	50 51 Supply 24Vac/d

Mechanical Specifications	
Mount	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Material	PC-ABS Thermoplastic
Self-extinguishing	V0 (UL94)
Comparative Tracking Index (CTI)	300V
Color	White
Operating temperature	-10÷60°C; Storage: -30÷85°C
Relative humidity	20÷85% (no condensing)

HSVD - 1, 2 & 3 VALVE DRIVER(S)

Analog Input	
Analog Conversion Type	10-bit A/D converter
Number of Inputs	HSVD20 = 4 HSVD30 = 6
Type of Analog Input	NTC 10K Thermistor 0-5V Pressure Transducer
Detection Time	100ms (in any case it depends on the cycle time set by the user in the given application)
Additional Power	+12V: 80mA in total (between +12V and analogue outputs) +5v: 6mA



NOTICE See Specifications Warnings Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged. 3-10

NOTES:

ELECTRICAL

▲ WARNING

IMPORTANT!

Make sure the machine is switched off before working on electrical connections. All operations must be carried out by qualified personnel. To ensure proper connections, comply with the following:

DO NOT work around live electrical equipment.

Check supply voltage is correct before connecting devices. Never use power that differs from what is indicated in the manual. Power supplies other than those specified can seriously damage the system.

Separate the cables of the analog inputs from those of the digital inputs and the serial line cables from the power cables (resistive as well as inductive), in order to prevent malfunction due to electromagnetic interference.

Make connections as short as possible, and do not wind them around electrically connected parts.

Follow connection diagrams carefully when connecting loads.

Never connect the secondary of the supply transformer to the Earth.

The low voltage connections must have reinforced insulation.

When utilizing the digital inputs of the CoreLink Case Controller use another transformer in order to prevent the digital inputs from malfunctioning or being damaged.

To avoid causing static discharge, do not touch the electronic components on the boards. DO NOT use the same secondary of the controllers power. Doing so can result in damage to case controller.

DO NOT exceed the maximum current capacity of the onboard controller relays.

Always verify the capacity of the output used.

DO NOT plug in accessory devices that are not approved by Hussmann.

GND is Common(-), not earth ground. Do not earth ground this device.

DO NOT connect the shield to the earth or to GND terminals of the device when using Belden 8760/8770 cable, avoid accidental contacts by using insulating tape. The shielding in RS485 cable is to remain disconnected when setting up network connection.

Permitted Use

- > Food Display Merchandisers
- Coolers
- Self-Contained Cases
- > Remote Cases

Improper Use

- ➤ HVAC
- > Unspecified Installation
- Deviation from established Legislation and Standards

Hussmann is not responsible for misuse of device. Hussmann is not held responsible for deviation from this manual and its intended use. If you have any questions, please contact your local Hussmann Representative for details.

In case of failure or faulty operation, send the controller back to the distributor with a detailed description of the fault.

The controller should not be used for purposes different from those described in this manual. It cannot be used as a safety device.



NOTE: Temperature Sensors, Pressure Transducers and valve cables can be extended to a maximum 40ft (12.2m) with Beldon 8760/8770. DO NOT connect cable shield to earth or device GND.



NOTE: Temperature Sensors, Pressure Transducers and valve cables can be extended to a maximum 40ft (12.2m) with Beldon 8760/8770. DO NOT connect cable shield to earth or device GND.

CoreLink[™] Case Controller



Digital Outputs / Relay

Note: Check intended load capacity. Use external relays where nessesary.

1	40	Relay Common			
	41	Relay Common			
1	42	Fans			
1	43	Lights			
	44	Heaters (Defrost)			
	45	(Refrig)			
I	46	Alarm			
1	47	Relay Common			
1	48	Relay Common			
	4	AUX 1			
	U				
	50	AUX 2			



Note: If using pressure transducer, use pin 14 for GND



		Contro 30VA (ller P Vac)	owe / 25	r Supply W (Vdc)	
to the could be seen as	POW 24Vac	/ Vdc	9	4	GND	24VAc / Vdc
			10	2		1.000
Corel ink™			11	ω		
COTCENT			12	4		
			13	S	+12V I	Power (Graph)
			14	6	+5V F	ower 100mA
Care Controllor HUSSMANN"			15	7		
Bung mars All			16	00		
	USB Max Output 200mA Add	<u>تواریم</u> روانی الفانی الفانی Aitional P	з р II owei	4 5 12 13 r (pir	6 7 8 14 15 16 5 (+12Va	dc) – pin 6 (+5Vdc)

Additional power: +12V (200mA in total between +12V and analog outputs) +5V 100mA Available

Note: If analog outputs are used, available power on the +12V is reduced. Please check loads between any powered accessories and configures analog outputs.

Web UI Power Tracking

Available Power @ +12V Output			Configured Analog Outputs		
40 / 200 mA	AOC01	AOC02	AOC03	AOC04	
12V Output	-				

12V Output		
	200 / 200 mA	

Available power 200mA @ +12V Output. No analog outputs configured.



Note: Additional unused digital inputs available

Connection example

Supply

DIGITAL INPUTS

Corelink features 11 Configurable Digital Inputs. For

your convenience, the ports have been assigned from the factory. Please refer to the image above or the Web UI for channel information.

To activate available ports please use another transformer in order to prevent digital inputs from malfunctioning or being damaged.

DO NOT use the secondary from other devices to power digital inputs.

Use 24Vac by sending one lead to the digital common and the other lead to the desired digital port to activate that digital switch.

When using 24Vdc make sure negative is sent to digital common.

User can select and choose polarity of the switch contact. Please review the default options.

Polarity options: Normally Open Normally Closed



DIGITAL OUTPUTS 8 Configurable Channels

Ports have been assigned by the factory. Please refer to the images on the previous page.

A single 110 Vac line is sent to the digital output commons. Users might notice a bridge wire for maximum setups requiring all 8 relays.

A bridge can be used across the two groups of commons to make the relay rail all the same voltage on the outputs.

DO NOT bridge dissimilar voltage potentials. Is could result in the failure of devices running lower voltage.



GND

Pb6 PbC Co Analog Out3 Out3

Alarm

2

External

Relavs

C03 C04

C06 C08

Group B

41 40

COM COM COM COM COM

Group A

Digital Output 01-04

Digital Input

DIC01

The relays are broken into two groups. Each group has two terminals for common inputs.

A user have the option to run two different voltage potentials for various applications.

Polarity – The digital outputs polarity is set by the controller and is configurable.

Polarity options: Normal Open Normal Closed

Delay – User can select a defined time frame before the relay activates



ANALOG INPUTS

6 Configurable Channels

Ports have been assigned by the factory. Please refer to the image.

Users can terminate between coil outlet temp sensors or defrost terminate sensors.

Return air temp available for analytics.





HSVD20

4 Analog inputs

Use this valve driver for single or two coil setups.

2 Valves Max

Communication Cable Positive - Positive Negative - Negative

HSVD30

6 Analog input

Use this valve driver for two coil or three coil setups.

3 Valves Max

Communication Cable Positive - Positive Negative - Negative





P/N 0557046_A

HSVD30 Full Setup


HSVD30 3-Valve





HSVD30 1-Valve





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CoreLink[™] Case Controller





P/N 0557046_A



CoreLink[™] Case Controller

4-20

NOTES:

P/N 0557046 A

CORELINK WEB USER INTERFACE

The CoreLink case controller has the capability of hosting its own internal Web UI.

Users can benefit from a clearly articulate interface by making the most pertinent CoreLink information instantly available at the case level.

Technicians can review case configuration setup, alarms, performance history, force command operations, input/output verification and make configuration adjustments.

Simple wire diagrams with dynamic view for simple circuit tracing are also available.

Devices listed below can be used to access the CoreLink Web UI.

- Smart Phone
- Tablet
- Laptop

Compatible Versions:

Internet Explorer 10 or higher Microsoft Edge (Version 25) Google Chrome (Version 50) Mozilla Firefox (Version 46) Opera (Version 37) Safari (Version 10)

Connection Methods:

USB to Ethernet Adaptor



This connection method can be used to plug into user's laptop or desktop

Ethernet ports

Note: Local Area Connection Settings Required. Please refer to network settings...

Wireless Mini Router

Wireless Router



tablet or smart device seamless. This does not typically require special network settings. Simply select the device in your wireless connection menu and enter the device password. After successfully connecting to your wireless router device, go straight to your web browser and type the controller IP in the address bar.

Laptop

This connection method makes connecting to a



ADJUSTING NETWORK SETTINGS

(Users using a USB to Ethernet Cable.)

Your computer must have an IP address that is on the same domain as the CoreLink Controller. Use this procedure to temporarily change your computer's IP address:

Go into your computer's Control Panel and click on "Network and Sharing Center" or right click the network icon on your computer's desktop bar and select "Network and Sharing Center"

Select Change Adaptor Settings

Right click "Local Area Connection" for cable connections



Right click "Wireless Network Connection" for wireless connections.



Select "Properties"

Select "Internet Protocol Version 4 (TCP/IPv4)"

	•	📥 Internet	Protocol \	Version	4 (TCP	/IPv4)	
Select "Prop	ert	ties"				Properties	

Note: Record any current IP settings that might be used in the computer so that you can easily revert back after connecting to the Corelink Case Controller.

CORELINK DEFAULT IP SETTINGS

Enter the settings on this page for either your local connection or wireless connection.

You can get IP settings assigned a this capability. Otherwise, you ne for the appropriate IP settings.	automatically if your ed to ask your netw	network su ork adminis	upports trator
问 Obtain an IP address automa	atically		
() Use the following IP address	:		
IP address:	192 . 168 .	0.249	1
Subnet mask:	255 . 255 .	0.0	1
Default gateway:	4 4		Ĩ.
 Obtain DNS server address a Use the following DNS server Preferred DNS server: Alternate DNS server: 	automatically r addresses:		1
Validate settings upon exit		Advar	nced

Select "OK" Close All Windows

You are now ready to connect to the Corelink Case Controller user interface.

Open your web browser, and in the web address line, type "192.168.0.250"

Corelink Default IP 192.168.0.250

ACCESSING CORELINK CASE CONTROLLER

Open Browser

192.16	58.0.250/level_2	Q
	HUSSI	ниш
	Hussmann1	
_		
Re	member username	

User Name Credentials

Level 1 User Name: Hussmann 1 Password: Hussmann

Level 2 User Name: Hussmann 2 Password: Corelink1234

COMMON PROBLEMS

Clearing Cache

Try clearing your browser's cache. If the Web UI has been revised you may need to clear your brower's cache in order for the Web UI to work correctly and see new updates.

If the CoreLink login screen does not appear after typing in the web address , first check that hardwire connections or wireless connection are correct.

If connections are good and devices power up, please check mini router settings by logging into the routers Web UI.

For cable setups, please review your computer's network settings.

If ongoing problems continue, please contact your local IT Department or Hussmann Help Center.

NOTES:

APPLICATION

WARNING

Safety Warnings and Precautions

DO NOT set low Super Heat target that is unworkable. Doing so could harm the compressor running equipment. Target 4-12

ONLY experienced professionals should access PID settings/tuning.

Use caution when tuning PID setpoints.

Auto-adaptive mode is the Hussmann preferred method for controlling Super Heat.

Command Menu:

DO NOT disable fans for long durations while in refrigeration mode. Avoid any flood potential.

DO NOT force valves to 100% without monitoring coil Super Heat.

NEVER leave the system unattended when using manual control on valves or fans.

REFRIGERATION PRINCIPLE OPERATION

The case controller regulates case temp by pressure / temperature input.

The coil out temperature sensor provides temperature input for the case controller to compare actual suction saturation temperature. The controller can then determine calculated Super Heat and make adjustments to valve position to precisely regulate Super Heat for best energy/performance.

For cases with multiple coils the process is duplicated, except for a single pressure input is only required per case.

For correct operation coil outlet temp and suction pressure are minimum requirements.



MULTI-CIRCUIT VALVE DRIVER



P/N 0557046_A

REFRIGERATION

Control Mode		
Control Mode:	Superheat Only	÷
Apply	Standard Continuous Suction	
	Superheat Only	

Standard: The control temperature is maintained by a setpoint and deadband. Once the control temperature reaches setpoint plus ½ deadband, the call for refrigeration is ON and both the compressor output and the superheat control are active.

If the control temperature is below the setpoint minus ½ deaband, the compressor output and superheat are not active.

Continuous: The control temperature is maintained by a PID and the superheat control is always active. The application will compare the percent output of the temperature control and superheat control and maintain at the minimum percentage the valve output. The compressor output will remain ON, unless the application is in defrost.

Two calculations are running at the same time. Each with a predicted valve opening. The calculation with the lower opening is the one the controller will apply. This helps maintain a higher case temperature when suction pressure temperature is too low.

Suction: The control temperature is maintained by a setpoint and deadband. Once the control temperature reaches setpoint plus ½ deadband, the call for refrigeration is ON and both the compressor output and the Suction Control are active. If the control temperature is below the setpoint minus ½ deaband, the compressor output and Suction Control are not active. The Suction Control valve percentage output is provided by a PID.

Superheat Only: The control temperature is maintained by evaporator pressure. During this mode target superheat is maintained at all times except defrost. No temperature setpoint can be applied.



Temp Setpoint: Temperature setpoint in which refrigeration will start.

Deadband: Margin from temp setpoint in which refrigeration will not be active.

Dual Temp: In dual temperature mode, the refrigeration setpoint plus the dual temperature offset value provides the active setpoint for the refrigeration control mode (Standard, Continuous).

The switch occurs when the dual temperature digital input has a closure (active) and returns to the regular setpoint once the input is open (non-active).

Users will notice that some parameters do not pertain to all modes and will hide on the Web UI when certain modes are applied.

REFRIGERATION

Control Mode

Control Mode: 1

Continuous

When in continuous mode the Continuous Mode PID menu will appear.

Users should use this menu to set the PID control for the air discharge portion of the continuous mode calculation.

The Superheat PID menus should be in auto adaptive mode unless user specified for the superheat portion of the calculation.

Ŧ

Case temperature will be regulated by these two PID's and the controller will always use whichever calculation with the minimum calculated valve opening.

Continuous Mode

P: Dei Band Offset: (-50 to 50) °F 0.0

Start with these Settings...

Superheat Menu

Refrigeration Menu

Superheat Control PID

Valve 1 Autoadaptive Mode: On 0.0 (0 to 45) °F Apply

	14.0	(0 to 30) °F
	120	(0 to 255) sec
	0	(0 to 255) sec
vative Time:	0	(0 to 255) sec

Temperature Sensors

Weight 1:	0	%
Weight 2:	0	%
Weight 3:	0	%
Control Mix:	Coil 1	•
Control Temperature Mode: 9	Average	•

Apply

Door Mode 6

Door Switch Active:	No	•
Apply		

DOOR OPERATION

The door function needs to be enabled in order to be operational. Once it is active, the door function will have the following options:

• If the digital input registers an open door, a timer starts to count until it reaches the user-adjustable delay time setpoint. Once it does, the alarm is active until the door closes. If the door closes before reaching the adjustable delay setpoint, the timer resets.

• If the digital input registers an open door, the refrigeration turns OFF and two timers start to count until they reach their user-adjustable delay times setpoint. Once reached, the first adjustable delay setpoint forces the refrigeration back ON, and the second adjustable setpoint activates the alarm. The alarm is active until the door closes. If the door closes before reaching the adjustable delay setpoint, the timer resets.

Clean Mode 🚯		
Clean Switch Active:	No	
Apply		

CLEAN SWITCH OPERATION

The clean switch function needs to be enabled for it to operate. Once it is active the clean switch function has the following options:

• If the digital input registers a closure (active), the application turns OFF the refrigeration. Refrigeration turns ON once the digital input is open (non-active). • If the digital input registers a closure (active), the application turns OFF the refrigeration and a timer will start to count until it reaches the user-adjust-able delay time setpoint. Once the delay setpoint has been reached the refrigeration turns back ON.

Door Mode **1**

Door Switch Active:	Yes	•
Door Mode:	Shutdown + Alarm	-
Door Refrigeration Timer:	19	(0 to 120) x 10 sec
Door Alarm Timer:	120	(0 to 120) x 10 sec

Apply

REFRIGERATION

Door Mode:

If in alarm mode, door alarm will be active if digital input registers an open door longer than the door alarm timer.

If in shutdown + alarm, when door digital input registers an open door, the refrigeration will turn off and two timers will start to count until they reach their user adjustable delay times setpoints.

Time lapse refrigeration will be active after door refrigeration delay.

Door Refrigeration Timer:

Amount of time until refrigeration restarts after a door is open.

Door Alarm Timer: Amount of time until door alarm becomes active after a door is open.

P/N 0557046_A

Yes	•	
Switch		
0	(0 to 360) x 10 sec	
	Yes Switch 0	

CLEAN MODE

If in alarm mode, door alarm will be active if digital input registers an open door longer than the door alarm timer.

If in shutdown + alarm, when door digital input registers an open door, the refrigeration will turn off and two timers will start to count until they reach their user adjustable delay times setpoints.

Time lapse refrigeration will be active after door refrigeration delay.

Clean Timer:

Amount of time until unit resumes normal operation in back on mode. Users can try more aggressive settings, but valve wear and compressor damage can result if caution is not used.

Always consult your local Hussmann Representative for best practices. Let our team of consultants help optimize your setup needs.

SH1 = Left Coil SH2 = Center Coil SH3 = Right Coil

WARNING

When adjusting superheat settings pay attention to min/max superheat alarms. Some settings might drive the controller into constant alarms if those parameters are not adjusted in conjunction with superheat targets.

SUPERHEAT

Superheat Setpoint 0

	Range (1 to 40) °F		
SH1:	7.0	۰	
SH2:	7.0	۰	
SH3:	7.0	۰	

Apply

SUPERHEAT SETPOINT

The superheat setpoint is used to regulate the superheat. Users should choose a practical superheat target for good system stability. Usually $6 - 12^{\circ}$ is appropriate for most case setups.

SUPERHEAT

Shared Pressure 6

Shared Preassure: Pressure 1

SHARED PRESSURE:

Option to share a single pressure transducer for SH calculation or individual pressure transducers for more precise SH control.

Most controllers setups will utilize this pressure sharing mode in order to reduce component cost.

Some special applications might require all three pressure transducers for superheat control.

Valve Limits 0

Min Valve Position 1:	20	%
Min Valve Position 2:	18	%
Min Valve Position 3:	7	%
Max Valve Position 1:	75	%
Max Valve Position 2:	75	%
Max Valve Position 3:	75	%

Apply

MIN VALVE POSITION:

Min valve position for coil. The valve cannot be closed less than the value calculated by the PID except in cases it is in alarm or the application is satisfied by the temperature.

MAX VALVE POSITION:

Max valve position for coil one. The valve cannot be opened more than the value calculated by the PID.

AUTO ADAPTIVE MODE

Superheat Control PID 6

Valve 1		
Autoadaptive Mode:		On
<u>P:</u>	0.0	(0 to 45) °F

Apply

-

P not equal to zero

Superheat Control PID 6

Valve 1			
Autoadaptive Mode:		Off	
<u>P:</u>	14.0		(0 to 45) °F
	120	(0 to 255) sec
D:	0	(0 to 255) sec
Band Offset:	0.0		(-50 to 50) °F

Apply

AUTO ADAPTIVE MODE:

Corelink Case Controller proprietary algorithm for regulating superheat control.

P = Proportional Band; 0 means auto adaptive mode.

I = Integral sampling interval

D = Derivative sampling interval

Band Offset = Offsets from the (P) value in the PID.

P/N 0557046_A

Superheat Alarm 0

0.0	(-25 to 25.0) °F
0.0	(-25 to 25.0) *F
0.0	(-25 to <u>25.0</u>) °F
25.0	(<u>0.0</u> to 90) *F
25.0	(<u>0.0</u> to 90) °F
25.0	(<u>0.0</u> to 90) °F
	0.0 0.0 0.0 25.0 25.0 25.0

Apply

MIN SH ALARM:

Lowest superheat temperature possible before the alarm timer starts for coil one. After timer delay, valve is closed 0% to protect compressor. Any time superheat goes above min SH alarm setpoint, the timer resets and the valve position will return to minimum position or current PID calculated position.

If min SH alarm is set too high, large disruptions in air discharge can occur due to valve closing for a period of time. Appropriate settings need to be chosen along with target superheat for consideration.

MAX SH ALARM:

Highest superheat temperature possible before the alarm starts for coil one. After timer delay, valve is opened 100%. Anytime superheat goes below max SH alarm setpoint, the timer resets and the valve position will return to current PID calculated position.

Alarm Delay 6

	Range (0	to 300) sec
SH Alarm Delay 1:	5	sec
SH Alarm Delay 2:	5	sec
SH Alarm Delay 3:	5	sec

ALARM DELAY:

Delay in seconds before the superheat alarm becomes active for coil one.

This is the time delay period when case controller is in low or high superheat alarm.

After the time delay, the controller will react based on type of alarm. That could be scramming a valve to the closed position to prevent low superheat and hurting equipment, or opening a valve to max position due to high superheat resulting in high case temperatures.

When the alarm is cleared the delay time is reset for the next event.

6-10 DEFROST



ELECTRIC MODE: Once in electric defrost mode, the application turns off refrigeration by deactivating the refrigeration output and closing the electronic valve if in use. After a user-defined delay, the defrost relay would be activated for a user-defined duration.

Hot Gas Mode: Once in hot gas defrost mode, the application turns off refrigeration by deactivating the refrigeration output and, if in use, keeps the electronic valve open or closed during defrost according to a user-defined selection. After a user-defined delay, the defrost relay would be activated for a user-defined duration.

Hot Gas Valve Position:

Valve position during defrost for all valves. 0% or 100%

Max Defrost Duration:	30	(1 to 60) min
Min Defrost Duration:	8	(1 to 40) min
Defrost Delay:	0	(0 to 30) min
Drip Time:	0	(0 to 30) min
Max Wait:	0	(1 to 60) min
Defrost Intervals:	8	(1 to 255) hours

MAX DEFROST DURATION:

Maximum time in minutes for active defrost mode. Prevents continuous defrost due to faulty termination temperature sensor failing to terminate cycle.

MIN DEFROST DURATION:

Minimum time in minutes for active defrost mode. Prevents early defrost termination due to faulty termination temperature sensor.

DEFROST DELAY:

After switching from refrigeration to defrost, the delay until defrost starts.

DRIP TIME:

Amount of time after defrost for the coil to drip.

MAX WAIT:

Refrigeration starts if in wait period and the endwait input is active. If no supervisory controller is available (offline), the application ignores the end wait-input and will not use it for the start refrigeration logic.

This mode is only available if BAS system is connected to the case controller.

Defrost Intervals:

Time between defrost cycles in hours.

Defrost Termination Mode: 🕄	Temperature	-
Termination Temperature Sensor: 🕄	Coil Out	•
Termination Temperature Setpoint:	48.0	(0 to 99) °F
Temperature Combination:	Average	•

Defrost Termination Mode:

Use termination temperature sensor or digital/network input.

TERMINATION TEMPERATURE SENSOR:

Use analog input coil out [BLUE Sensors] temperature sensor or analog input defrost [ORANGE sensors] temperature termination sensor.

TERMINATION TEMPERATURE SETPOINT:

Temperature setpoint at which defrost ends.

P/N 0557046_A

P/N 0557046_A

TEMPERATURE COMBINATION:

Maximum – Uses the highest value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

Minimum – Uses the lowest value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

Average – Uses the average value between all available/enabled coil-out temperature sensors or defrost-termination sensors.

FANS

Fans

Termination Temperature Sensor:	Coil Out	*
Fan Mode: 🛈	On Continuous - On Defrost	-

Apply

FAN OPERATION MODES

On Refrigeration – On Defrost: Fans cycle with Rerigeration - On during defrost

Note: Fan operation after defrost does not apply in this mode.

On Refrigeration – Off Defrost: Fans cycle with Refrigeration - Off during defrost

Note: Fan operation after defrost applies in this mode.

On Continuous - On Defrost:Fans [ON] Running at all times irrespective of system status.

Note: Fan operation after defrost does not apply in this mode

On Continuous – Off Defrost:Fans [OFF] during defrost.

Note: Fan operation after defrost applies in this mode.

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Fans

Termination Temperature Sensor:	Coil Out	-
Fan Mode: 🕄	On Refrig - Off Defro	st
Fan Operation after Defrost: 🕄	Temperature	-
Fan Setpoint:	50.0	(-10 to 70) °F
Fan Hysteresis:	2.0	(1 to 30) °F
Fan Delay:	0	(0 to 30) x 10 sec

Apply

Termination Temperature Sensor:

Important parameter information from Defrost Menu. Fans menu will use this selected temperature sensor for fan function.

FAN MODE:

4 selectable fan control modes

FAN OPERATION AFTER DEFROST:

By Temperature: In refrigeration mode if selected termination temperature sensor is above the fan setpoint, the fan output is OFF.

By TIME: After defrost and switching into refrigeration mode, the fan starts the delay timer for a user-defined time before the output is active.

Fan Setpoint:

Temperature setpoint in which case fans will start.

FAN HYSTERESIS:

Temperature margin from the fan setpoint in which the fan will not be active.

FAN DELAY:

After defrost and switching into refrigeration mode, time before fans start (Time Mode)

6-12

Alarms 6

Alarm Option:	Absolute	
Dual-Temp Mode:		Off
Alarm Delay:	30	(0 to 255) min
Alarm Hysteresis:	0.0	(0 to 20) °F
Low Temp:	24.0	(-40 to <u>36.0</u>) °F
riigii renip.	36.0	(<u>24.0</u> to 99) °F

HIGH TEMP:

Highest temperature the case may reach before the alarm sets.

Low Temp:

Lowest temperature the case may reach before the alarm starts.

Alarm Hysteresis:

Temperature margin from alarm setpoint in which the temperature must drop before the alarm shuts off.

ALARM DELAY:

Time delay before the alarm activates if there is a problem.

DUAL-TEMP MODE:

The refrigeration temp setpoint plus the dual temperature setpoint value provides the active setpoint for the refrigeration control mode (Standard, Continuous, and Suction). The switch occurs when the dual temperature digital input has a closure (active) and returns to the regular setpoint once the input is open (non-active)

Note: Under "Alarm Options" please use relative alarm for dual temp operation. In many cases absolute alarm will trigger false alarms when operating in dual temp mode because the high temp and low temp alarms are not adjusted. By switching to relative alarm, during dual temp operation the alarm setpoint is added (High Temp) or subtracted (Low Temp) from the new refrigeration temp setpoint

ALARM OPTION:

In an absolute alarm, the alarm parameter is the threshold for the alarm.

In a relative alarm, the alarm setpoint is added to the parameters, and its sum becomes the alarm threshold.

Anti-Sweat Control 0

Dew Setpoint:	45.0	(0 to 100) °F
Dew Proportional Band:	0.0	(0 to 20) °F
Max Output:	100	%
Min Output:	0	%



ANTI-SWEAT CONTROL

The anti-sweat control operation maintains the door frame temperature above the dewpoint setpoint or dewpoint network value using a proportional calculation with user-adjustable minimum and maximum output. If the frame sensor is not available, the output is fixed to 100%.

• If no network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint setpoint. • If a network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint value.

Dew Setpoint:

If no network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint setpoint.

Dew Proportional Band:

User defined range from which the temperature can drift from the Dew Setpoint.

MAX OUTPUT:

Maximum anti-sweat power output.

Min Output:

Minimum anti-sweat power output.

P/N 0557046_A

Anti-Sweat Control 0

Dew Setpoint:	45.0	(0 to 100) °F
Dew Proportional Band:	0.0	(0 to 20) °F
Max Output:	100	%
Min Output:	0	%

Apply

Dew Setpoint:

If no network dewpoint value is available, the frame temperature maintains a user-adjusted band above the dewpoint setpoint.

Dew Proportional Band:

User defined range from which the temperature can drift from the Dew Setpoint.

MAX OUTPUT:

Maximum anti-sweat power output.

MIN OUTPUT:

Minimum anti-sweat power output.

VALVE SELECTION

Valve Selection 6

Valve Type 1:	SporlSER(I)GJK
Valve Type 2:	Manual AlcoEX4-5-6 AlcoEX7
Valve Type 3:	AlcoEX8-500st/s DanfETS-25/50
Apply	DanfETS-250/400 SporlSEI.5to11 SporlSER1.5to20 SondSE130
Valve Selection When making a valve selection cl	SportSER(I)GJK SportSEI50 SportSEH(I)100 SportSEH(I)175

VALVE TYPE:

The Corelink Case Controller comes pre-loaded with 13 different stepper valve types.

VALVE SELECTION

When making a valve selection choice, select a value in the drop down menu, and then after applying the selected valves refresh the browser page to see updated valve information.

Anytime a valve is selected from the list many of the valve parameters will hide. To display all valve parameters select "Manual".

This will show all valve parameters that can be configured.

VALVE PARAMETERS

Valve Position After Defrost 6

Initial Step Regulation 1:	75	(<u>2 to 248</u>) x 10 steps
Initial Step Regulation 2:	75	(<u>2 to 248</u>) x 10 steps
Initial Step Regulation 3:	75	(<u>2 to 248</u>) x 10 steps

Apply

INITIAL STEP REGULATION:

When the valve regulation starts, valve moves to this position. As soon as the valve is in position the compressor can start.

	Range (10	to 600) steps/sec
Step Rate 1:	200	steps/sec
Step Rate 2:	200	steps/sec
Step Rate 3:	200	steps/sec

Apply

STEP RATE:

Valve Stens

Speed of valve. Steps per second.

	Range (0	to 50) x 10 steps
Min Steps 1:	0	x 10 steps
Min Steps 2:	0	x 10 steps
Min Steps 3:	0	x 10 steps
	Range (0	to 800) x 10 steps
Max Steps 1:	250	x 10 steps
Max Steps 2:	250	x 10 steps
Max Steps 3:	250	x 10 steps

MIN STEPS:

Below this number of steps, valve one has to be considered closed. In case of alarms or no consensus from the thermostat, the valve moves to this number of steps. This is the valve manufacturer recommended lower valve opening limit.

MAX STEPS:

Above this number of steps, valve one has to be considered open. This is the valve manufacturer recommended higher valve opening limit.

VALVE STEPS

	Range (0 t	to 500) steps
Extra Step 1:	100	steps
Extra Step 2:	100	steps
Extra Step 3:	100	steps
	Range (0	to 500) steps
Relax Step 1:	0	steps
Relax Step 2:	0	steps
Relax Step 3:	0	steps

EXTRA STEP:

When valve is at its min number of step (From Min Steps), the valve adds this many extra close steps to recover possible lost steps. Valve Overrun.

Relax Steps:

After any extra steps, if any, valve one is forced open for the number of steps specified here.

VALVE PARAMETERS

Current 6

	Range (0	to 100) x 10 mA
Peak Current 1:	12	x 10 mA
Peak Current 2:	12	x 10 mA
Peak Current 3:	12	x 10 mA
Real Providence	Range (0	to 100) x 10 mA
Hold Current 1:	5	x 10 mA
Hold Current 2:	5	x 10 mA
Hold Current 3:	5	v 10 mA

Apply

PEAK CURRENT:

Current in 10s of mA

(This means that if you write 20, the peak current is 200mA)

HOLD CURRENT:

Current in 10s of mA (This means that if you write 20, the peak current is 200mA)

Filters 6

	Range (0	to 60) sec
Interval Update 1:	0	sec
Interval Update 2:	0	Sec
Interval Update 3:	0	Sec
	Range (0	to 100) sec
Temp Filter 1:	1	sec
Temp Filter 2:	1	sec
Temp Filter 3:	1	sec

Apply

INTERVAL UPDATE:

At every n number of seconds, this value will act on valve. Value of zero means auto adaptive. Increasing the time slows down valve update.

TEMP FILTER:

This value is used to calculate the SH. If this value is 1, there is not any filter on the temperature. Increase time to reduce valve responses to large temperature system anomalies.

VALVE PARAMETERS

	Range (0) to 100) sec
Filter Pressure 1:	1	sec
Filter Pressure 2:	1	sec
Filter Pressure 3:	1	sec

Apply

VALVE MOTOR TYPE

Valve Motor Type

Solenoid Type (XEV20D_1 or XEV30K):	Bipolar	•
Solenoid Type (XEV20D_2):	Bipolar	•

Apply

FILTER PRESSURE:

In case of systems with a big fluctuation of the suction pressure, a filter may be useful. This value is used to calculate the SH. If this value is 1, there is not any filter on suction pressure. Increase time to reduce valve one responses to large suction pressure system anomalies.

VALVE MOTOR TYPE:

Select either Uni-Polar or Bi-Polar stepper valve.

6-16

The case controller can display numerous alarms.

Superheat – High/Low Case Temp – High/Low Door – Open/Closed

Along with various temperature probe failures.





Defrost Terminate:		Stop
Lights On/Off:		Turn On
Fan:	Automatic	Apply
Light:	Automatic	Apply
Refrigeration:	Automatic	Apply
Alarm:	Automatic	Apply

Valve 1 %:	101	Apply
Valve 2 %:	101	Apply
Valve 3 %:	101	Apply
Refrig Analog %:	101	Apply
Refrig %:	101	Apply
Anti-Sweat %:	101	Apply
Dim %:	101	Apply

Digital Output Re

Fan:	Off
Lights:	On
Defrost:	On
Refrigeration:	Off
Auxiliary 1:	Off
Auxiliary 2:	Off
Auxiliary 3:	Off

Level 2 Users can force various controller operations to help troubleshoot control problems or diagnose back room issues.

Digital Input Sv

Defrost Termination	Off
Defrost Initiate:	Off
Door Switch:	Off
Clean Switch:	Off
Dual-Temp Mode:	Off
Controller Disabled:	No

System Configuration

Temperature Units	۴	Apply
Light Units	FTC	Apply
Pressure Units	PSI	✓ Apply
Refrigerant	R404A	Apply
Valve Driver	XEV30D	Apply

Users can determine which units to display on the controller along with choosing refrigerant type.

Users can also define which valve driver is connected to the case controller.

Users can determine which units to display on the controller along with choosing refrigerant type.

Users can also define which valve driver is connected to the case controller.

Save/Restore Settings		•
	Save	Restore
Factory Restore Settings		Restore
Reboot Controller		Reboot

CoreLink provides ability to save or load up to three presets

Factory reset will restore controller back to factory configuration.

Reboot controller is for the convenience of restarting case controller remotely.

System Status

Status: DEFR	Case Family: D5X-LEP
Date: May 25, 2016 🖍	Time: 1:07:28 PM 🖍
Bios Version: 2015061500	Web UI Version: 0.3.0
Application Version: 1.2.8	Application Date Code: 51716
MAC Address: 00:00:00:00:a8:ea	IP Address: 10.70.132.116

XEV20D1 Offline XEV20D2 Offline XEV30D Online	S Offline	BAS
XEV20D2 Offline XEV30D Online	0D1 Offline	XEV20D1
XEV30D Online	0D2 Offline	XEV20D2
	BOD Online	XEV30D
IPEX Offline	Offline	IPEX

Case controller displays what version is loaded on the device along with providing a list of connected devices.

Network Configuration

Modbus Address	8	Apply
Baud Rate	9600	Apply

Modbus settings are also available from the system menu.

PARAMETERS

Refrigeration Menu							
Visible	Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range	
Level 1	Level 2	[Cntl]	Control Mode	4 selectable refrigeration control modes; Standard, Continuous, Suction, SH Only	SH Only	4 Options	
Level 1	Level 1	[Set]	Temp Setpoint	Temperature setpoint in which refrigeration will start.	32	(-40 to 90) °F	
Level 1	Level 1	[DB]	Deadband	Nargin from temp setpoint in which refrigeration will not be active.	2	(1 to 45)	
Level 2	Level 2	[DualT]	Dual Temp Setpoint	In dual temperature mode, the refrigeration setpoint plus the dual temperature offset value provides the active setpoint for the refrigeration control mode (Standard, Continuous, and Suction).	0	(0 to 20)	
Level 2	Level 2	[Weight1]	Weight 1	Contribution of each sensor to the temperature average.	50	(0-100) %	
Level 2	Level 2	[Weight2]	Weight 2	Contribution of each sensor to the temperature average.	50	(0-100) %	
Level 2	Level 2	[Weight3]	Weight 3	Contribution of each sensor to the temperature average.	50	(0-100) %	
Level 2	Level 2	[CntrlMix]	Control Mix	To Do	Coil 1	3 Options	
Level 2	Level 2	[CntlTyp]	Control Temperature Mode	Maximum: Uses the maximum value between all available/enabled discharge temperatures. On control sensor failure, the application searches for next maximum value. Uses the minimum value between all available/enabled discharge temperatures. On control sensor failure, the application searches for next minimum value. Average: Uses the average value between all available/enabled discharge temperatures. On a control sensor failure, the application will average only the non-failed sensors and will not use the failed sensor from the calculation. Mix: Uses the desired combination between all available/enabled discharge and corresponding return according to the following formula. Mix=(Discharge_Temp* Weighted% + Return_Temp*(100 - Weighted%))/100 Each pair of discharge and return temperatures have their own mix setting. Proportional band; 0 means autoadaptive mode is	Avg	4 Options	
Level 2	Level 2	[P]	Р	active.	0	(0 to 30) °F	
Level 2 Level 2	Level 2 Level 2	[I] [D]	D	Integral sampling interval Derivative sampling interval	180	(0 to 255) sec (0 to 255) sec	
		()		Sampling interval for calculating the derivative value		(
Level 2 Level 2	Level 2 Level 2	[DerTime] [BandOffst]	Band Offset	(D) in the PID Offset from the (P) value in the PID	0	(0 to 255) sec (-50 to 50)	
		(5. t. i)		Door mode ON/OFF; Door digital input becomes			
Level 2	Level 2	[DrAct]	Door Switch Active	active. If in alarm mode , door alarm will be active if digital input registers an open door longer than the door alarm timer. If in shutdown + alarm , when door digital input registers an open door, the refrigeration will turn OFF and two timers will start to count until they reach their user adjustable delay times setpoints. After door refrigeration delay time lapse refrigeration will be active.	No	Yes/No	
Level Z	Leverz	נטוויוטטפן		Amount of time until refrigeration restarts after a	Aidfffi		
Level 2	Level 2	[DrRefOn]	Door Refrigeration Timer	door is open. Amount of time until door alarm becomes active after	60	(0 to 120)x 10 sec	
Level 2	Level 2	[DrAlrm]	Door Alarm Time	a door is open.	60	(0 to 120)x 10 sec	
Level 2	Level 2	[ClnSw]	Clean Switch Active	becomes active.	No	Yes/No	
Level 2	Level 2	[ClnMode]	Clean Mode	Switch – the unit is in clean mode as long as the clean switch is active. Timer – switch sets a timer in which the case will start operating after set time has elapsed.	Switch	2 Options	
د امینم ا	Louis 2	[ClaTing -1	Clean Times	Amount of time until unit resumes normal operation	00	(0 to 200): 10 -:	
Level 2	Level 2	[CINTIME]	clean Timer	in back on modé.	90	10 10 360)X 10 Sec	

			Sup	erheat Menu		
Visible	Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range
Level 1	Level 1	[SH1]	SH1	Coil One Superheat Target	8	(1 to 40) °F
Level 1	Level 1	[SH2]	SH2	Coil Two Superheat Target	8	(1 to 40) °F
Level 1	Level 1	[SH3]	SH3	Coil Three Superheat Target	8	(1 to 40) °F
Level 1	Level 3	[ShrP]	Shared Pressure	Option to share a single pressure transducer for SH calculation or individual pressure transducers for more precise SH control.	Pressure 1	4 Options
Level 2	Level 3	[MinP1]	Min valve Position 1	Min valve position for coil one. The valve cannot be closed less than the value calculated by the PID except in cases it is in alarm or the application is satisfied by the temperature.	0	(0-100) %
				Min valve position for coil two. The valve cannot be closed less than the value calculated by the PID except in cases it is in alarm or the application is satisfied by the		
Level 2	Level 3	[MinP2]	Min Valve Position 2	temperature.	0	(0-100) %
Level 2	Level 3	[MinP3]	Min valve Position 3	closed less than the value calculated by the PID except in cases it is in alarm or the application is satisfied by the temperature.	0	(0-100) %
Level 2	Level 3	[MaxP1]	Max Valve Position 1	Max valve position for coil one. The valve cannot be opened more than the valve calculated by the PID.	100	(0-100) %
Level 2	Level 3	[MaxP2]	Max Valve Position 2	Max valve position for coil two. The valve cannot be opened more than the valve calculated by the PID.	100	(0-100) %
				Manual a section for estimation The sector sector		
Level 2	Level 3	[MaxP3]	Max Valve Position 3	opened more than the valve calculated by the PID.	100	(0-100) %
Louis 2	Lovel 2	[0]	D	Proportional band; U means autoadaptive mode is	0	(0 to 45) %
Level 2	Level 3	[F]	<u>г</u>	Integral sampling interval	0	(0 to 255) sec
Level 2	Level 3	[0]	D	Derivative sampling interval	0	(0 to 255) sec
Level 2	Level 3	[BandOffst]	Band Offset	Offset from the (P) value in the PID	0	(-50 to 50) °F
Level 2	Level 2	[SHmin1]	Min SH Alarm 1	Lowest superheat temperature possible before the alarm timer starts for coil one. After timer delay, valve is closed 0% to protect compressor. Anytime superheat goes above min SH alarm setpoint, the timer resets and the valve position will return to minimum position or current PID calculated position.	2	(-25 to 50) °F
Level 2	Level 2	[SHmin2]	Min SH Alarm 2	Lowest superheat temperature possible before the alarm timer starts for coil two. After timer delay, valve is closed 0% to protect compressor. Anytime superheat goes above min SH alarm setpoint, the timer resets and the valve position will return to minimum position or current PID calculated position	2	(-25 to 50) °F
		[2[]]][2]	Min SH Alarm 2	Lowest superheat temperature possible before the alarm timer starts for coil three. After timer delay, valve is closed 0% to protect compressor. Anytime superheat goes above min SH alarm setpoint, the timer resets and the valve position will return to minimum position or current PD calculated position	2	(-25 to 50) F
Level 2	Level 2	[SHmax1]	Max SH Alarm 1	Highest superheat temperature possible before the alarm starts for coil one. After timer delay, valve is opened 100%. Anytime superheat goes below max SH alarm setpoint, the timer resets and the valve position will return to current PID calculated position.	25	(-5 to 90) °F

Level 2	Level 2	[SHmax2]	Max SH Alarm 2	Highest superheat temperature possible before the alarm starts for coil two. After timer delay, valve is opened 100%. Anytime superheat goes below max SH alarm setpoint, the timer resets and the valve position will return to current PID calculated position.	25	(-5 to 90) °F
		[[]]		Highest superheat temperature possible before the alarm starts for coil three. After timer delay, valve is opened 100%. Anytime superheat goes below max SH alarm setpoint, the timer resets and the valve position	25	(5.1.00) 85
Level 2	Level 2	[SHmax3]	Max SH Alarm 3	will return to current PID calculated position.	25	(-5 to 90) °F
Level 2	Level 2	[LOP1]	Low Operating Pressure 1	If the pressure is below this setpoint for alarm delay seconds, valve one will open (LOP/MOP) alarm step rate every second. During this condition, the system will not detect High and Low SH.	-90	(-90 to 90) °F
Level 2	Level 2	[LOP2]	Low Operating Pressure 2	If the pressure is below this setpoint for alarm delay seconds, valve two will open (LOP/MOP) alarm step rate every second. During this condition, the system will not detect High and Low SH.	-90	(-90 to 90) °F
Level 2	Level 2	[LOP3]	Low Operating Pressure 3	If the pressure is below this setpoint for alarm delay seconds, valve three will open (LOP/MOP) alarm step rate every second. During this condition, the system will not detect High and Low SH.	-90	(-90 to 90) °F
		-				
				If the pressure is above this setpoint for alarm delay seconds value one will close (LOP/MOP) alarm step rate		
				every second. During this condition, the system will not		
Level 2	Level 2	[MOP1]	Max Operating Pressure 1	detect High and Low SH.	90	(-90 to 90) °F
Level 2	Level 2	[MOP2]	Max Operating Pressure 2	If the pressure is above this setpoint for alarm delay seconds, valve two will close (LOP/MOP) alarm step rate every second. During this condition, the system will not detect High and Low SH.	90	(-90 to 90) °F
Leverz	LEVELZ				50	(50 10 50) 1
Level 2	Level 2	[MOP3]	Max Operating Pressure 3	If the pressure is above this setpoint for alarm delay seconds, valve three will close (LOP/MOP) alarm step rate every second. During this condition, the system will not detect High and Low SH.	90	(-90 to 90) °F
				The rate at which the valve opens or closes when valve		
Level 2	Level 2	[StpML1]	Steps Open/Close 1	reached.	5	(1 to 75)x 10 steps
				The rate at which the valve opens or closes when valve		
Level 2	Level 2	[StpML2]	Steps Open/Close 2	two low operating pressure or max operating pressure is reached.	5	(1 to 75)x 10 steps
				The rate at which the valve opens or closes when valve		
Level 2	Level 2	[StpML3]	Steps Open/Close 3	is reached.	5	(1 to 75)x 10 steps
Louis 2	Lov-10	[[[]]]		Delay in seconds before the superheat alarm becomes	60	(0 to 200)
Level 2	Level 2	[5801]	SH Alarm Delay 1	Delay in seconds before the superheat alarm becomes	Ud	(U tO 300) SEC
Level 2	Level 2	[SHd2]	SH Alarm Delay 2	active for coil two.	60	(0 to 300) sec
Louis 2	Lovel 2	[6042]		Delay in seconds before the superheat alarm becomes	60	(0 to 200) cos
Level Z	Level 2	[3003]	ST Alariti Delay 3	active for coll three.	00	(0 t0 500) sec

			De	frost Menu		
Visible	Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range
Level 1		[DefTyp]	Defrost Mode	Electric mode for cases with installed electric heaters.	Floctric	2 Options
LEVELT	Leverz	[Dellyp]	Denost Mode	not gas mode for cases with not gas denosis system.	LIEUTIC	2 00110113
				Maximum time in minutes for active defrost mode.		
				Prevents continuous defrost due to faulty termination		
Level 1	Level 1	[DefDur]	Max Defrost Duration	temperature sensor failing to terminate cycle.	60	(1 to 60) min
				Minimum time in minutes for active defrost mode.		
				Prevents early defrost termination due to faulty		
Level 1	Level 1	[MinDef]	Min Defrost Duration	termination temperature sensor.	10	(1 to 40) min
				After switching from refrigeration to defrost, the		
Level 2	Level 2	[DefDly]	Defrost Delay	delay until defrost starts.	0	(0 to 30) min
Level 1	Level 1	[Drip]	Drip Time	Amount of time after defrost for the coil to drip.	0	(0 to 30) min
				Refrigeration starts if in wait period and the end-wait		
				input is active. If no supervisory controller is available		
				(offline), the application ignores the end wait-input		
Level 2	Level 2	[MaxWait]	Max Wait	and will not use it for the start refrigeration logic.	0	(1 to 60) min
Level 1	Level 2	[Intervals]	Defrost Interval	Time between defrost cycles in hours.	4	(1 to 255) hours
		()		Use termination temperature sensor or		
		[lermlyp]	Defrost Termination Mode	digital/network input.		2 Options
				Use analog input coil out [BLUE] temperature sensor		
Laural 4	1	[Tama Cam]		or analog input defrost [URANGE] temperature	Call Out	2 Ontinue
Level 1	Level 1	[TermSen]	Sensor	termination sensor.	Coll Out	2 Options
Loval 1	Lovel 1	[TormSot]	Sotrocint	Tomporature extension at which defrect and	40	(0 to 00) °F
Level 1	Level 1	[TermSet]	Setpoint	Maximum: Uses the highest value between all	40	(01099) F
				available/enabled coil-out temperature sensors or		
				defrost-termination sensors. Minimum:		
				Uses the lowest value between all available/enabled		
				coil-out temperature sensors or defrost-termination		
				sensors. Average: Uses the average		
				value between all available/enabled coil-out		
				temperature sensors or defrost-termination		
Level 2		[TmnComb]	Temperature Combination	sensors		3 Ontions
LEVEI Z	LEVEIZ	[IIIIbcound]		Valve position during defrost for all valves 0% or	Average	5 Options
Level 2	Level 2	[Vdef%]	Hot Gas Valve Position	100%	100	(0% or 100%)
	Fans Menu					
---------	--	-----------	-----------------------------	---	--------------------------	-------------------
Visible	Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range
Level 1	Level 2	[FanOp]	Fan Mode	4 selectable fan control modes.	On Refrig Off Defrost	4 Options
	Not Used: By temperature: In refrigeration mode if selected termination temperature sensor is above the fan setpoint, the fan output is OFF.					
Level 1	Level 2	[FanDef]	Fan Operation after Defrost	time: After defrost and switching into refrigeration mode, the fan starts the delay timer for a user- defined time before the output is active.	Not Used	3 Options
Level 1	Level 2	[FanSet]	Fan Setpoint	Temperature setpoint in which case fans will start. (Temperature Mode)	48	(-10 to 70) °F
Level 2	Level 2	[FanHy]	Fan Hysteresis	Temperature margin from the fan setpoint in which the fan will not be active.	0	(1 to 30)
Level 2	Level 2	[FanTm]	Fan Delay	After defrost and switching into refrigeration mode, time before fans start. (Time Mode)	0	(0 to 30)x 10 sec

	Alarm Settings Menu						
						6	
Visible	Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range	
				Highest temperature the case may reach before the			
Level 1	Level 2	[HiTemp]	High Temp	alarm starts.	36	(0 to 99) °F	
				Lowest temperature the case may reach before the			
Level 1	Level 2	[LoTemp]	Low Temp	alarm starts.	28	(-40 to 99) °F	
				Temperature margin from alarm setpoint in which the			
Level 1	Level 2	[AlrHy]	Alarm Hystersis	temperature must drop before the alarm shuts off.	0	(0 to 20)	
				Alarm Delay: Time delay before the alarm activated if			
Level 1	Level 2	[AlrDly]	Alarm Delay	there is a problem.	30	(0-255)min	
				In an absolute alarm, the alarm parameter is the			
				threshold for the alarm. In a relative alarm, the alarm			
				setpoint is added to the parameters, and its sum			
Level 1	Level 2	[AlrOption]	Alarm Option	becomes the alarm threshold.	Absolute	2 Options	
				If and superheat calculation related sensors fail, this is			
Level 1	Level 2	[SHFail%]	Superheat Fail Valve Position	the default valve position in case of a failure.	15	(0 to 100) %	
				If and suction calculation related sensors fail, this is			
Level 1	Level 2	[SCFail%]	Suction Fail Valve Position	the default valve position in case of a failure.	15	(0 to 100) %	

Anti-Sweat Menu							
Visible	Access	VISOGRAPH	Web III Parameter	Desciption	Default	Range	
VISINC	7100055	150017411	If no notwork downoint value is available the frame		Delaute	nunge	
				in no network dewpoint value is available, the name			
				temperature maintains a user-adjusted band above			
Level 2	Level 2	[DewSet]	Dew Setpoint	the dewpoint setpoint.	52	(0 to 100) °F	
				User defined range from which the temperature can			
Level 2	Level 2	[DewPB]	Dew Proportional Band	drift from the Dew Setpoint.	5	(0 to 20) °F	
Level 2	Level 2	[ASWMax]	Max Output	Max Output Maximum anti-sweat power output.		(0 to 100) %	
Level 2	Level 2	[ASWMin]	Min Output	Minimum anti-sweat power output.	0	(0 to 100) %	

Light Menu					
Visible Access	VISOGRAPH	Web UI Parameter	Desciption	Default	Range

Visihle	Access	VISOGRAPH	Web III Parameter	Descintion	Default	Range
101010		1.000.000		Predefined valve selection for valve one. This will	Derudit	
				overwrite valve parameters with the controller defaults		
		(icoa)		for the selected valve. Use manual for custom		
level 2	Level 3	[tEP1]	valve Type 1	applications. Predefined valve selection for valve two. This will	Manual	14 Options
				overwrite valve parameters with the controller defaults		
				for the selected valve. Use manual for custom		
level 2	Level 3	[tEP2]	Valve Type 2	applications.	Manual	14 Options
				overwrite valve parameters with the controller defaults		
				for the selected valve. Use manual for custom		
level 2	Level 3	[tEP3]	Valve Type 3	applications.	Manual	14 Options
				this position. As soon as the valve is in position the		
level 2	Level 3	[ISt1]	Initial Step Regulation 1	compressor can start.	30	(0 to 800)x 10 steps
				When the valve regulation starts, valve two moves to		
lovel 2	Level 3	[15+2]	Initial Step Regulation 2	this position. As soon as the valve is in position the	30	(0 to 800)y 10 steps
level 2	Levers	[13(2]	mitial Step Regulation 2	When the valve regulation starts, valve three moves to	50	(0 to 500)x 10 steps
				this position. As soon as the valve is in position the		
level 2	Level 3	[ISt3]	Initial Step Regulation 3	compressor can start.	30	(0 to 800)x 10 steps
				Below this number of steps, valve one has to be		
				considered closed. In case of alarms or no consensus		
				from the thermostat, the valve moves to this number of		
level 2	Level 3	[15+1]	Min Stens 1	steps. This is the valve manufacturer recommended	0	(0 to 50)y 10 Steps
iever 2	Levers	[[0(1]]	Will Steps 1	lower valve opening inne.	Ŭ	(0 10 50) 10 51005
				Below this number of steps, valve two has to be		
				considered closed. In case of alarms or no consensus		
				steps. This is the valve manufacturer recommended		
level 2	Level 3	[LSt2]	Min Steps 2	lower valve opening limit.	0	(0 to 50)x 10 Steps
				Below this number of steps, valve three has to be		
				considered closed. In case of alarms or no consensus		
				from the thermostat, the valve moves to this number of		
				lower valve opening limit.		
level 2	Level 3	[LSt3]	Min Steps 3	Above this number of stens, value one has to be	0	(0 to 50)x 10 Steps
				considered open. This is the valve manufacturer		
level 2	Level 3	[USt1]	Max Steps 1	recommended higher valve opening limit.	250	(0 to 800)x 10 steps
				Above this number of steps, valve two has to be		
level 2	Level 3	[USt2]	Max Steps 2	recommended higher valve opening limit.	250	(0 to 800)x 10 steps
				Above this number of steps, valve three has to be		
level 2	Level 3	[USt3]	Max Steps 3	recommended higher valve opening limit.	250	(0 to 800)x 10 steps
			·			. , .
				When valve one is at its min number of step (From Min		
level 2	Level 3	[FX1]	Extra Sten 1	Steps), the valve adds this many extra close steps to recover possible lost steps. Valve Overrup	10	(0 to 500) steps
		[]				(0.00000,0000
				When valve two is at its min number of step (From Min		
level 2	Level 3	[FX2]	Extra Sten 2	Steps), the valve adds this many extra close steps to recover possible lost steps. Valve Overrup	10	(0 to 500) steps
101012	Levers	[2/12]		recover possible lost stepsi valte overrain	10	(0 10 500) 51005
				When valve three is at its min number of step (From Min		
loval 2	Lovel 2	[EV3]	Extra Stop 2	Steps), the valve adds this many extra close steps to	10	(0 to E00) stops
level 2	Levers	[[],5]	Extra Step 5	After any extra steps, if any, valve one is forced open for	10	(0 10 500) steps
level 2	Level 3	[RX1]	Relax Step 1	the number of steps specified here.	0	(0 to 500) steps
laurel 2	Laural 2	[0/2]	Deley Ster 2	After any extra steps, if any, valve two is forced open for	0	(0.4- 500) store
ievei 2	Level 3	[KX2]	neidx Step 2	the number of steps specified here.	U	(U LU SUU) steps
				After any extra steps, if any, valve three is forced open		
level 2	Level 3	[RX3]	Relax Step 3	for the number of steps specified here.	0	(0 to 500) steps
2 امیرم	1 AVA 2	[\$81]	Sten Rate 1	Speed Steps per second value one	200	(10 to 600)
ievei 2	Levels	[201]	Step hate 1	specu. steps per second valve one.	200	(10 to 600)
lovel 2		[CD2]	Stop Pate 2	Sneed Steps per second value two	200	stons/soc

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Stepper Valves							
Valve Type	Model	Min Steps	Max Steps	Peak Current	Hold Current	Step Rate	
tEP		LSt	uST	СРР	CHd	SR	
0	Manual Setting	User Defined					
1	Alco EX4-EX5-EX6	5	75	50	10	500	
2	Alco EX7	10	160	75	25	500	
3	Alco EX8 500 step/s	10	260	80	50	500	
4	Danfoss ETS-25/50	7	262	10	10	500	
5	Danfoss ETS-100	10	353	10	10	500	
6	Danfoss ETS-250/400	11	381	10	10	500	
7	Sporlan SEI .5 to 11	0	159	16	5	500	
8	Sporlan SER 1.5 to 20	0	159	12	5	500	
9	Sporlan SEI 30	0	319	16	5	500	
10	Sporlan SER(I) G, J, K	0	250	12	5	500	
11	Sporlan SEI-50	0	638	16	5	500	
12	Sporlan SEH(I)-100	0	638	16	5	500	
13	Sporlan SEH(I)-175	0	638	16	5	500	

The Hussmann pressure transducer is constructed with a stainless steel housing and a 1/8 inch male national pipe thread (NPT) fitting.

The rugged design makes it compatible with all HFC/HCFC refrigerants and ammonia.

The sensor includes a 20-ft cable with a Packard connector to allow for ease of sensor replacement.

0-200 PSI	P/N: 0554218
0-650 PSI	P/N: 0529188

The temperature sensor has a 10K Ω thermistor.

The thermistor is enclosed in a nickel-plated brass shell with epoxy. The sensor has a green 20-ft pigtail. The wire is a 22 AWG CL3X cord with 2 conductors.

The cable is UL rated for 194°F (90°C). The sensor has been tested by Hussmann to maintain less than 0.72°F error between -40 and 248°F.

Green P/N: 0529189 Blue P/N: 0529190 Orange P/N: 0529191 Purple P/N: 0418813

0-5V Pressure Sensor

Volts	0-150 PSI	0-200 PSI	0-300 PSI	0-500 PSI	0-650 PSI
0	0	0	0	0	0
0.2	6	8	12	20	26
0.4	12	16	24	40	52
0.6	18	24	36	60	78
0.8	24	32	48	80	104
1	30	40	60	100	130
1.2	36	48	72	120	156
1.4	42	56	84	140	182
1.6	48	64	96	160	208
1.8	54	72	108	180	234
2	60	80	120	200	260
2.2	66	88	132	220	286
2.4	72	96	144	240	312
2.6	78	104	156	260	338
2.8	84	112	168	280	364
3	90	120	180	300	390
3.2	96	128	192	320	416
3.4	102	136	204	340	442
3.6	108	144	216	360	468
3.8	114	152	228	380	494
4	120	160	240	400	520
4.2	126	168	252	420	546
4.4	132	176	264	440	572
4.6	138	184	276	460	598
4.8	144	192	288	480	624
5	150	200	300	500	650

NTC 10K Temperature Sensor

Temperature	Temperature	
(°F)	(°C)	Resitance Ω
-40	-40	336,450
-30	-34	234,170
-20	-29	165,210
-10	-23	118,060
0	-18	85,399
10	-12	62,493
20	-7	46,235
30	-1	34,565
40	4	26,100
50	10	19,899
60	16	15,311
70	21	11,883
80	27	9,299
90	32	7,334
100	38	5,828
110	43	4,664
120	49	3,758
130	54	3,048
140	60	2,488
150	66	2,042
160	71	1,686
170	77	1,400
180	82	1,169
190	88	981
200	93	827

ALARMS

Case Alarm - Case temperature is either too high or too low

- ► Low Alarm
- ▶ High Alarm

Superheat - If coil is only a few degrees above saturation on the coil outlet, superheat is too low and could be dangerous for compressor operation. If coil temp is drastically above saturation temperature on the coil and missing target, superheat is too high for normal refrigeration performance.

- ► Low Alarm
- ▶ High Alarm
- Door Alarm Door has been left open longer than expected.
- > Motion Alarm
- > Input Alarm short or open @ the analog input
- Probe Error high value translates to a probe error

Web UI	Alarms Status	HUSSMANN	Status Configuration -	Alarms
	Superhea	t		
		SH1	SH2	SH3
	Low	ок	ок	ок
	High	ок	ок	ок
	General			
	Low Temp	ок	High Temp	ОК
	Door	ок	Motion	ок



REGULATORY COMPLIANCE AND CONTACT INFORMATION

- With reference to Directive 2002/96/EC of the European Parliament and of the Council of 27 January
- 2003 and to the relative national legislation, please note that:
- There lies the obligation not to dispose of electrical and electronic waste as municipal waste but to separate the waste.
- Public or private collection points must be used to dispose of the goods in accordance with local laws. Furthermore, at the end of the product's life, it is also possible to return this to the retailer when a new purchase is made.
- This equipment may contain hazardous substances. Improper use or incorrect disposal can have adverse effects on human health and the environment.
- The symbol shown on the product or the package indicates that the product has been placed on the market after 13 August 2005 and must be disposed of as separated waste.
- Should the product be disposed of incorrectly, sanctions may be applied as stipulated in applicable local regulations regarding waste disposal.

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To obtain warranty information or other support, contact your Hussmann representative. Please include the model and serial number of the product.

Hussmann Corporation, Corporate Headquarters: Bridgeton, Missouri, U.S.A. 63044-2483 01 October 2012