

PipeGuard[®] CMH

Constant Wattage Heating Cable



Installation and Maintenance Guide

PipeGuard CMH

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GENERAL INFORMATION

This manual is designed to provide detailed instructions on how to install Drexan Energy Systems PipeGuard CMH Constant-wattage **Metallic-sheathed High-temperature** heating cables on metal piping/vessels.

For applications not covered in this guide please contact Drexan Energy Systems or your local Authorized Representative.

- **What is PipeGuard CMH Cable?**

Drexan PipeGuard CMH heaters are rugged, high temperature, parallel circuit, inorganic, metal-clad, constant-wattage heating cables that can be used for freeze protection or process temperature maintenance for metal pipe and vessels in ordinary and hazardous locations.

- **Why use PipeGuard CMH Cable? PipeGuard CMH:**

- can be cut to length in the field and can replace mineral insulated cables for most applications.
- excels in modular construction applications or where precise piping details are unavailable or in any application where cut to length and field fabrication is preferred.
- is not hygroscopic and will not seek to attract and hoard ambient water vapor molecules as do other metallic sheathed heating cables such as series type mineral insulated (MI).
- is offered in several types of corrugated metal sheath materials. The combination of tough, flexible metallic sheath results in a heater that is extremely resistant to impact, abrasion, vibration and corrosion.
- will not easily work harden from repeated flexing.
- reduces the high level of detailed engineering that is required when using series type mineral insulated (MI) cable.
- can reduce total installed costs, compared to using Series type mineral insulated (MI) cables, due to easy handling, fast installation characteristics from standard-sized reels (~150 m, 500 ft).
- ensures an exact fit to the length of the pipe - eliminating cold spots along the pipe length.
- easily accommodates field changes due to its ability to be spliced by any qualified electrician.

- **How PipeGuard CMH Works**

The heating element in PipeGuard CMH cable consists of multiple-redundant nichrome resistance wires contained within insulating structures designed to cushion and protect the heating elements from mechanical or thermal cycling abuse.

Contacts with parallel circuit bus wires are also multiple-redundant and have been tested under a variety of mechanical and electrical stress conditions.

All PipeGuard CMH cables have either one or two foot zones.

PIPEGUARD CMH CABLE CHARACTERISTICS

Product	Wattage W/ft.	Voltage VAC	Bus Wire awg	Max. Heater Length ft./m	Width inches	Thickness inches	Max Continuous Exposure Temps	
							Power On °C/°F	Power Off °C/°F
5CMH120	5	120	14	275/84	0.57	0.47	400/752	450/842
10CMH120	10			225/69			380/716	
15CMH120	15			150/46			350/662	
20CMH120	20			120/37			300/572	
30CMH120	30			75/23			250/482	
5CMH208	5	208	14	500/152	0.57	0.47	400/752	450/842
10CMH208	10			335/102			380/716	
15CMH208	15			250/76			350/662	
20CMH208	20			210/64			300/572	
30CMH208	30			130/40			250/482	
5CMH240	5	240	14	600/183	0.57	0.47	400/752	450/842
10CMH240	10			380/116			380/716	
15CMH240	15			290/88			350/662	
20CMH240	20			240/73			300/572	
30CMH240	30			150/46			250/482	
5CMH277	5	277	14	700/213	0.57	0.47	400/752	450/842
10CMH277	10			450/137			380/716	
15CMH277	15			350/101			350/662	
20CMH277	20			275/84			300/572	
30CMH277	30			170/52			250/482	

PIPEGUARD CMH PERFORMANCE CHARACTERISTICS

T-Ratings – Devices are classified according to rated output and the conditions of use

Temperature withstand: Power off - 450°C maximum withstand

Power on - 400°C maximum maintain for 5 W/ft. cable

Power on - 380°C maximum maintain for 10 W/ft. cable

Power on - 350°C maximum maintain for 15 W/ft. cable

Power on - 300°C maximum maintain for 20 W/ft. cable

Power on - 250°C Maximum maintain for 30 W/ft. cable

CMH CABLE REFERENCE CHART		
CABLE REFERENCE	COLOUR CODING (Target resistance per zone (ohm))	ZONE LENGTH
5CMH208	BLACK (4326)	2 FT
5CMH277	LIME GREEN (7673)	
10CMH240	WHITE (2880)	
5CMH208 10CMH277	BLUE (3836)	
15CMH277	ORANGE (2558)	
5CMH120	NO COLOUR (2880)	
15CMH208		
20CMH240		
10CMH120	YELLOW (1440)	
30CMH208		
10CMH208	DARK GREEN (4326)	
15CMH120	BROWN (960)	
10CMH208	RED (3836)	
15CMH240		
20CMH277		
20CMH120	GREY (720)	
20CMH208	FLUOR PINK (2163)	
30CMH120	LIGHT BLUE (480)	
30CMH240	PURPLE (1920)	

PRE-INSTALLATION CHECKS

Check the Pipe to be Trace Heated

- a) Verify the pipe has been pressure tested and that all the equipment and supports are installed.
- b) Verify that any paint or coatings used on the pipe are dry.
- c) Walk the pipe system and plan the routing of the trace heating cable on the pipe. Note the accessibility of all parts of the line, including power locations.
- d) Confirm construction welding has been completed on the pipe to be traced.
- e) Remove any sharp burrs or edges that could damage the heating cable under extended pipe vibration circumstances.

Plan the Installation

Compare design drawings with actual pipe and note any differences in:

- Pipe length and sizes
- Number of valves, gauges and other pipe hardware.
- Number of pipe supports.
- Ensure the trace heating system meets the requirements of the area classification.

Mark Location of Cable Components

- a) While walking the pipe, mark the location of Power connections, tees and splices on the pipe with spray paint or marker.
- b) In cases where the components cannot be mounted on the pipe, construct brackets or other supports.

Receiving Trace Heating Cable on Site

- a) Carefully unload and observe all packing warning labels.
- b) Only use forklifts for palletized or large reel shipments
- c) Leave protective coverings in place as much as possible, open and inspect heating cable for in-transit damage. Undamaged cable/components should be repacked until the cable is to be used.
- d) Verify packing list is accurate.
- e) Confirm the cable catalog number matches the information on the packing list. The cable information is printed on the spool and on the supplied tags attached to the spool.

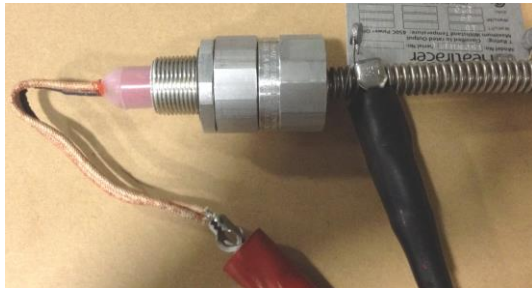
INSTALLATION

The installation of PipeGuard CMH is quick and simple and requires few special skills or tools. Installers have three power connection options. In addition to end connections, they can make center feeds with powered splice or powered tee kits. 2, 3 or 4 heaters can be connected using splice, tee, and cross components, making as-built modifications in the field very simple. Where branch lines have smaller diameters and lower heat loss than larger headers, different wattages of PipeGuard CMH can be connected together using the same components.

The cable should be meggered with a 500 V megger when received, prior to installation and after installation.

The insulation resistance reading should be 20 MOhm or higher prior to installing the cable. After thermal insulation is installed on the pipe ensure the megger reading is 5 MOhm or higher.

The black lead (ground) connects to the sheath and the red lead wires connect to the conductors.



The cable and component systems should be stored in a clean, dry area.

PipeGuard CMH cable is to be fastened to the pipe with stainless steel tie wire.

Make all electrical connections to heating cables above grade.

Wire in accordance with all Electrical Code practices.

It is not recommended to weld pipes after heating cable has been installed.

All heat sinks such as pipe supports, valves, pumps, will require extra heat due to their inherent higher heat losses.

Do not allow the cable to come in contact with itself or overlap or cross as this may create hot spots and could result in cable failure or violate area classification temperature limits.

All cable circuits require a permanently affixed tag, supplied with the cable (extra tags available if required) indicating the voltage ratings, wattage outputs and certifications.

PipeGuard CMH Cable Termination Kits (CMH-CON) contain sufficient material to complete one heating cable circuit (2 terminations, power/end). The CMH-PWR kit is sufficient to terminate one power end. The CMH-LP-E is a low profile end seal.

Note: junction boxes are not included with the termination kits.

HEATER DESIGN REQUEST

Requested by:		No. of Pages	
Company:		Phone:	Fax:
Contact Name:		Title:	
Project Name:			
Measurement:	<input type="checkbox"/> Metric <input type="checkbox"/> Imperial	Temperature:	<input type="checkbox"/> Celsius <input type="checkbox"/> Fahrenheit
Voltage (include if 3 phase):			
APPLICATIONS			
Pipe Tracing:	<input type="checkbox"/> Metal	<input type="checkbox"/> Other (specify):	
Pipe Length:		Diameter:	Insulation Type:
Insulation Thickness:	<input type="checkbox"/> Not Yet Determined		
Low Ambient Temp:		Max. Pipe Temp:	Maintain Temp:
Area Classification:	Class:	Div. :	Group:
Number of Supports:		Valves:	Hangers:

TROUBLESHOOTING SELF-REGULATING HEATING CABLE

<u>Symptom</u>	<u>Probable Cause</u>	<u>Remedy</u>
Circuit Breaker Trips	Breaker undersized for the length of the cable on that circuit	Revisit the current loads and resize breakers or shorten the cable run lengths Note: Check Feeder wire size to confirm a larger breaker may be used
	Defective breaker	Replace
	Heater wire is in contact with sheath.	Locate and repair termination
	Physical damage to cable causing a short	Locate and repair
	Heating cable connections or feeder wire may be shorting out either by contaminations, moisture, or contact between bus wires in the connection	Locate and repair
Zero power output	Low or no input voltage	Repair electrical supply
	Connections not properly made	Repair connections
Power output is correct but pipe temperature is below design values	Insulation is wet or open exposing the pipe to the ambient air.	Remove and replace with dry insulation
	Insufficient cable was installed on pipe shoes, valves or other heat sinks	Splice in additional cable BUT do not exceed the maximum circuit length for the breaker size
	Thermostat setting is incorrect	Adjust thermostat to correct setting.
	Incorrectly designed.	Revisit the design conditions and criteria. Modify as required.

FOR HEATTRACER TECHNICAL ASSISTANCE CALL 1-800-663-6873 (NORTH AMERICA ONLY) OR +1.780.413.1774

APPENDICES – ensure printed documents are latest revisions – contact Drexan or go to <http://drexan.siraza.net/> if links do not work

APPENDIX A – [INSTALLATION INSTRUCTIONS – CMH-CON \(CMH-CONNECT / DREX0074\)](#)

APPENDIX B – [INSTALLATION INSTRUCTIONS – CMH-LP-E \(CMH-Low Profile End Seal / DREX0075\)](#)

APPENDIX C – [INSTALLATION DRAWING – CMH TERMINATION JUNCTION BOX](#)

APPENDIX D – [INSTALLATION DRAWING – CMH TERMINATION STAHLIN JUNCTION BOX](#)

APPENDIX E – [INSTALLATION DRAWING – CMH LIGHTED END SEAL](#)

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APPENDIX G – [INSTALLATION DRAWING – TYPICAL CMH SPLICE](#)

APPENDIX H – [INSTALLATION DRAWING – CMH LOW PROFILE END SEAL](#)

APPENDIX I – [INSTALLATION DRAWING – PIPEGUARD CMH HEATING CABLE – RECOMMENDED INSTALLATION ON A PIPE SHOE](#)