

PIPEGUARD CMH

Constant Wattage Heating Cable



INSTALLATION and MAINTENANCE GUIDE

GENERAL INFORMATION

This manual is designed to provide detailed instructions on how to install Drexan Energy Systems PipeGuard CMH **M**etallic-sheathed **C**onstant-wattage **H**igh-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 cable can be cut to length in the field and can replace mineral insulated cables for most applications.

PipeGuard CMH cable 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.

PipeGuard CMH cable 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).

PipeGuard CMH 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. PipeGuard CMH will not easily work harden from repeated flexing.

PipeGuard CMH cable reduces the high level of detailed engineering that is required when using series type mineral insulated (MI) cable.

Compared to using Series type mineral insulated (MI) cables, PipeGuard CMH can reduce total installed costs due to easy handling, fast installation characteristics from standard-sized reels (~150 meters, 500 feet). It ensures an exact fit to the length of the pipe eliminating cold spots along the pipe length.

Field changes are easily accommodated due to PipeGuard CMH's 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 buss 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 Power Off	Wattage	Voltage	Bus Wire	Max.Length	Width	Thickness	Power On	
	(W/ft)	(VAC)	(awg)	FT/M	(inches)	(inches)	deg. C/°F	deg. C/°F
5CMH120	5	120	14	275/84	0.57	0.47	400/752	450
10CMH120	10	120	14	225/69	0.57	0.47	380/716	450
15CMH120	15	120	14	150/46	0.57	0.47	350/662	450
20CMH120	20	120	14	120/37	0.57	0.47	300/572	450
30CMH120	30	120	14	75/23	0.57	0.47	250/482	450
5CMH208	5	208	14	500/152	0.57	0.47	400/752	450
10CMH208	10	208	14	335/102	0.57	0.47	380/716	450
15CMH208	15	208	14	250/76	0.57	0.47	350/662	450
20CMH208	20	208	14	210/64	0.57	0.47	300/572	450
30CMH208	30	208	14	130/40	0.57	0.47	250/482	450
5CMH240	5	240	14	600/183	0.57	0.47	400/752	450
10CMH240	10	240	14	380/116	0.57	0.47	380/716	450
15CMH240	15	240	14	290/88	0.57	0.47	350/662	450
20CMH240	20	240	14	240/73	0.57	0.47	300/572	450
30CMH240	30	240	14	150/46	0.57	0.47	250/482	450
5CMH277	5	277	14	700/213	0.57	0.47	400/752	450
10CMH277	10	277	14	450/137	0.57	0.47	380/716	450
15CMH277	15	277	14	350/101	0.57	0.47	350/662	450
20CMH277	20	277	14	275/84	0.57	0.47	300/572	450
30CMH277	30	277	14	170/52	0.57	0.47	250/482	450

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 watt/ft cable
- Power on - 380°C maximum maintain for 10 watt/ft cable
- Power on - 350°C maximum maintain for 15 watt/ft cable
- Power on - 300°C maximum maintain for 20 watt/ft cable

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

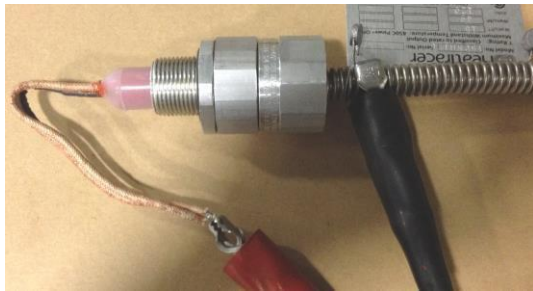
INSTALLATION

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 centre 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 volt megger when received, prior to installation and after installation.

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

Contact: _____ Fax: _____

Project Name: _____

Measurement: †Metric †Imperial Temperature: †Celsius † Fahrenheit

Voltage: (include if 3 phase) _____

APPLICATIONS

Pipe Tracing: †Metal † Other (specify) _____

Pipe Length: _____ Diameter: _____ Insulation Type: _____

Insulation Thickness: _____ †Not Yet Determined

Low Ambient Temp: _____ Max. Pipe Temp: _____ Maintain Temp: _____

Area Classification: Class _____ Div. _____ Group _____

Number of Supports _____ Valves _____ Hangers _____

TROUBLESHOOTING CMH HEATING CABLE

Symptom	Probable Cause	Remedy
Circuit Breaker Trips	Breaker undersized for the length of 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 to ground	Locate and repair
	Heating cable connections or feeder wire may be shorting out either by contamination, moisture, contact between bus wires in the connections.	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 Temperatures are 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 cct 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.

Installation Instructions

CMH-CON, CMH®- Connect



These installation instructions are for use with the following Drexan HeatTracer constant wattage heater products: PipeGuard® CMH

CMH-CON is suitable for Division 1 Locations only if used with Division 1 Adapter Kit-DIVI-ADP (Model/Part No. DREX0019)

This kit may be installed in temperatures as low as -40°F/-40°C.

WARNING: This is an electrical device and in order to ensure proper operation and prevent shock or fire it must be installed correctly. Read these important warnings. Follow all installation instructions.

CAUTION: Ground-fault equipment protection must be used to minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed and to comply with Drexan requirements, agency certifications and national electrical codes. Conventional circuit breakers may not stop arcing. The metal sheath of CMH heating cable shall be grounded, but shall not be used as the grounding means.

CAUTION: A ground fault protection device must be used with this heating device.

ATTENTION: Ce produit doit être utilisé avec une protection démise à la terre.

Each heating device branch circuit or each heating device shall have ground fault equipment protection.

Metallic structures or materials such as metal pipes used to support CMH cable shall be grounded.

CMH Cable:

is not to cross or come in contact with itself.

must be installed with Listed Thermal Switch temperature controller to limit the Power On Max Continuous Exposure Temperature as shown in "PipeGuard CMH Data Sheet# HD100318-1".

cable may be terminated or spliced in any certified enclosure mounted off the heated surface.

Component approvals and performance characteristics are based on Drexan specific parts only. Substitution will void approvals and performance claims.

Component and heating cable ends must be kept dry before and during installation.

Fire resistant thermal insulation should be used.

De-energize before installation or servicing.

Minimum bend radius @ 68°F (20°C): 1.0 in (25 mm).

APPROVALS



Class I, Div. 1/2, Groups A, B, C, D

Class II, Div. 1/2, Groups E, F, G

Class III

120- 277 Volt. 30 W/ft. max., Maximum withstand temperature 450°C power off

Drexan Energy Systems, Inc.
Kelowna, BC, Canada, V4V 1S5

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PartNo. DREX0074

KIT CONTENTS

- (2) Strain Relief Fittings (with grommets and washers)
- (2) Silicone Boots
- (2) ¾" Sealing Rings (use with HP-BRAK, bottom entry)
- (2) #2 Anti-short Bushings (optional accessories)
- (2) Heat Shrink Sleeves
- (2) Silicone Boots (for end seal only)
- Installation Instructions
- Silicone R1V Sealant

REQUIRED BUT NOT PROVIDED

Materials

- Pipe straps
- Thermostat
- Junction Box

Equipment

- HP-BRAK bracket
- Fine tooth hacksaw
- Pipe wrench
- CMH Stripping Tool
- Electrical Tape

I. ASSEMBLY INSTRUCTION DETAILS

Note: CMH cable may be terminated in any enclosure certified for the application. When using a non-metallic enclosure use a hub with a grounding lug.

1. Megger the insulation resistance between the sheath and conductors. The 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

Note: CMH Cable is a zone type cable. Refer to CMH Cable Reference Chart at the back of these instructions.

2. Using a hacksaw, cut the desired length of CMH cable allowing an extra three (3) feet (1m) per end and appropriate cable length for heat sinks such as valves, flanges and pipe supports.
3. Using a CMH Stripping Tool, strip the sheath back 12" (30.4 cm) from the raw end, remove and discard. This exposes the core to locate the zone node.

Note: If the cable has two-foot zones you may have to strip back up to 24" (60.8 cm). Refer to chart on page 4. Zones nodes can be identified by the indent in the core. Strip back the insulation to expose and confirm the location of the node

Note: If using a hacksaw cut around the sheath being careful not to damage the core.



4. From the node measure 14" (35.5 cm), mark the sheath and strip the sheath to the mark. Discard the sheath. Wrap a layer of electrical tape around the core, next to the sheath, to prevent the insulation from unwrapping into the sheath.



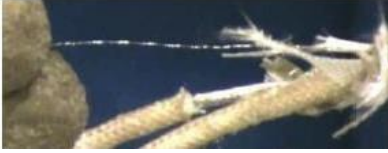
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5. Cut and remove the wrapped insulation, down to the tape and close to the end of the sheath, taking care not to damage the insulation on the bus wires. Discard the outer insulating layers and cut the heater element close to the tape.

Note: It is critical to ensure the heater element is cut cleanly and no strands can make contact with the sheath when installing the boot.



6. Place the supplied heat shrink over any exposed bus wire that might be present such as where the node was located. **Ensure the heater element is trimmed back close to the tape isolating the heater element from the sheath** or bus wire. This kills the next 10" (25.4 cm) zone of heating cable under the sheath and serves as a 10" (25.4 cm) cold lead.



7. Slide the cable connector, washer and grommet onto the cable sheath.



8. Position the boot over the buswires close to the sheath. Apply silicone sealant inside the boot and around the cable sheath, 1/2" (13 mm) from the end of the sheath.

Important: after installing the boot megger the cable between the sheath and conductors to ensure the heater element is isolated from the sheath. The insulation resistance reading should be 5 MOhm or higher.



9. Thread the cable connector (strain relief) into the junction box and tighten. Tighten the middle nut to engage the strain relief onto the cable sheath. Position the washer inside and grommet inside the chamber. Tighten down the nut compressing the grommet ensuring an environmental seal.

Note: If the washer is not positioned properly the grommet might be difficult to compress inside the chamber. Ensure all threads bottom out after tightening.



10. Make electrical connection as required.

II. END OF CIRCUIT TERMINATION

Note: CMH cable may be terminated in any enclosure certified for the application. When using a non-metallic enclosure use a hub with a grounding lug.

11. Repeat Steps# 1 through 8.

12. Trim the bus wire conductors to different lengths **UNLESS connecting to a Lighted End Seal where you will require sufficient tail length to make a connection in the box. (See instructions for CMH-LE-1/2R Lighted End Seal).**

Important: After completing the termination install, megger the cable between the sheath and conductors to ensure the heater element is isolated from the sheath. The insulation resistance reading should be 5 MOhm or higher.



13. Push the supplied silicone boots onto the conductors



14. Install into an approved enclosure

15. Thread the cable connector (strain relief) into the junction box and tighten. Tighten the middle nut to engage the strain relief onto the cable sheath. Position the washer and grommet inside the chamber. Tighten down the nut compressing the grommet ensuring an environmental seal.

Note: if the washer is not positioned properly in the chamber the grommet might be difficult to compress inside the chamber. Ensure all threads bottom out after tightening.



III. CMH CABLE REFERENCE CHART		
CABLE REFERENCE	COLOUR CODING (Target resistance per zone (ohm))	ZONE LENGTH
5CMH208	BLACK (4326)	2 FT
10CMH240	WHITE (2880)	
10CMH277 5CMH208	BLUE (3836)	
15CMH277	ORANGE (2558)	
5CMH120	NO COLOUR (2880)	
15CMH208		
20CMH240		
5CMH277	LIME GREEN (7673)	1 FT
10CMH120 30CMH208	YELLOW (1440)	
10CMH208	DARK GREEN (4326)	
15CMH120	BROWN (960)	
10CMH208 15CMH240 20CMH277	RED (3836)	
20CMH120	GREY (720)	
20CMH208	FLUOR PINK (2163)	
30CMH120	LIGHT BLUE (480)	
30CMH240	PURPLE (1920)	

III. PREVENTIVE MAINTENANCE

Prior to startup and on a regular annual basis it is recommended that both visual and electrical inspections be performed. The following is a list of heating cable system checks.

- Thermal Insulation: Check the waterproofing for damage as well as cracks or gaps in caulking on the thermal insulation to ensure no damage exists resulting in poor insulation values.
- Inspect all electrical enclosures for moisture, corrosion or foreign matter.
- Check all electrical connections for tightness and perform an insulation resistance check with a megger, from heating cable conductor to sheath (ground). The minimum resistance should be 5 MOhm or higher.

HEATING CABLE TESTING REPORT

Customer		Contractor	
Site Location		Project Ref.	
READINGS PRIOR TO INSTALLATION:			
Insulation Resistance (MOhm)		Panel No.	Breaker No.
Ambient Temp.		Volts	Amps
Tested By			Date
READINGS AFTER INSTALLATION:			
Insulation Resistance (MOhm)		Panel No.	Breaker No.
Ambient Temp.		Volts	Amps
Tested By			Date
FINAL READINGS:			
Insulation Resistance (MOhm)		Panel No.	Breaker No.
Ambient Temp.		Volts	Amps
Tested By			Date

Installation Instructions

CMH-LP-E

CMH® - Low Profile End Seal



These installation instructions are only for use with the following Drexan HeatTracer Constant Wattage heater products: PipeGuard@CMH

This kit may be installed in temperatures as low as -40°F/-40°C.

Note: Can be installed directly on pipe up to 121°C (250°F). If pipe temp is higher, install above insulation.

WARNING: This is an electrical device and in order to ensure proper operation and prevent shock or fire it must be installed correctly. Read these important warnings. Follow all installation instructions.

CAUTION: Ground-fault equipment protection must be used to minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed and to comply with Drexan requirements, agency certifications and national electrical codes. Conventional circuit breakers may not stop arcing. The metal sheath of CMH heating cable shall be grounded, but shall not be used as the grounding means.

CAUTION: A ground fault protection device must be used with this heating device.

ATTENTION: Ce produit doit être utilisé avec une protection démise à la terre.

Metallic structures or materials such as metal pipes used to support CMH cable shall be grounded.

PipeGuard CMH cable:

is not to cross or come in contact with itself.

is to be thermostatically controlled.

may be terminated or spliced in any certified enclosure mounted off the heated surface.

PipeGuard CMH heating cable and components comply to the IEEE 515 Standard for Electric Trace Heating.

Component approvals and performance characteristics are based on Drexan specific parts only.

Substitution will void approvals and performance claims.

Component and heating cable ends must be kept dry before and during installation.

Fire resistant thermal insulation should be used.

APPROVALS

c@us
LISTED

231572

E471335

Class I, Div. 1/2, Groups A, B, C, D

Class II, Div. 1/2, Groups E, F, G

Class III

120- 277 Volt. 30 W/ft. max., Maximum withstand temperature 450°C power off

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KIT CONTENTS

- (1) Corrugated Sleeve (321SS)
- (1) Silicone Large Boot
- (1) Tube Silicone RTV Sealant (high temperature)
- (2) Pipe Straps
- (2) Silicone Small Boots
- Installation Instructions

REQUIRED BUT NOT PROVIDED

Equipment

- CMH Stripping Tool
- Fine tooth hacksaw
- Electrical Tape

I. ASSEMBLY INSTRUCTION DETAILS

1. Megger the insulation resistance between the sheath and conductors. The 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.

Note: CMHCable is a zone type cable. Refer to CMH Cable Reference Chart at the back of these instructions.

2. Using a hacksaw, cut the desired length of CMH cable allowing an extra three (3) feet (1 m) per end and appropriate cable length for heat sinks such as valves, flanges and pipe supports.
3. Using a CMH Stripping Tool, strip the sheath back 12" (30.4 cm) from the raw end, remove and discard. This exposes the core to locate the zone node.

Note: If the cable has two-foot zones you may have to strip back up to 24" (60.8 cm). Refer to chart on page 5. Zones nodes can be identified by the indent in the core. Strip back the insulation to expose and confirm the location of the node

Note: If using a hacksaw cut around the sheath being careful not to damage the core.



4. From the node measure 14" (35.5 cm), mark the sheath and strip the sheath to the mark. Discard the sheath. Wrap a layer of electrical tape around the core, next to the sheath, to prevent the insulation from unwrapping into the sheath.



5. Cut and remove the wrapped insulation, down to the tape and close to the end of the sheath, taking care not to damage the insulation on the bus wires. Discard the outer insulating layers and cut the heater element close to the tape.

Note: It is critical to ensure the heater element is cut cleanly and no strands can make contact with the sheath when installing the boot.



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-
6. Trim the bus wire conductors to different lengths



Important: Prior to completing the termination end seal, megger the cable between the sheath and conductors to ensure the heater element is isolated from the sheath. The insulation resistance reading should be 5 MOhm or higher.

7. Push the supplied small silicone boots onto the conductors



8. Position the large boot over the bus wires close to the sheath. Fill the boot with silicone sealant and around the cable sheath, ½" (13 mm) from the end of the sheath.

Note: Squeeze the boot between fingers to remove excess air when filling the boot with silicone. Rotate the boot in onedirection when pushing onto the sheath to provide a good environmental seal.



Important: After installing the boot megger the cable from the powered end between the sheath and conductors to ensure the heater element is isolated from the sheath. The insulation resistance reading should be 5 MOhm or higher.

9. Use the remaining silicone inside the corrugated sleeve, spread silicone on the boot and slide the sleeve over the boot (end of cable) turning in one direction until it bottoms out. The corrugated sleeve provides mechanical protection of the environmentally sealed end of cable.

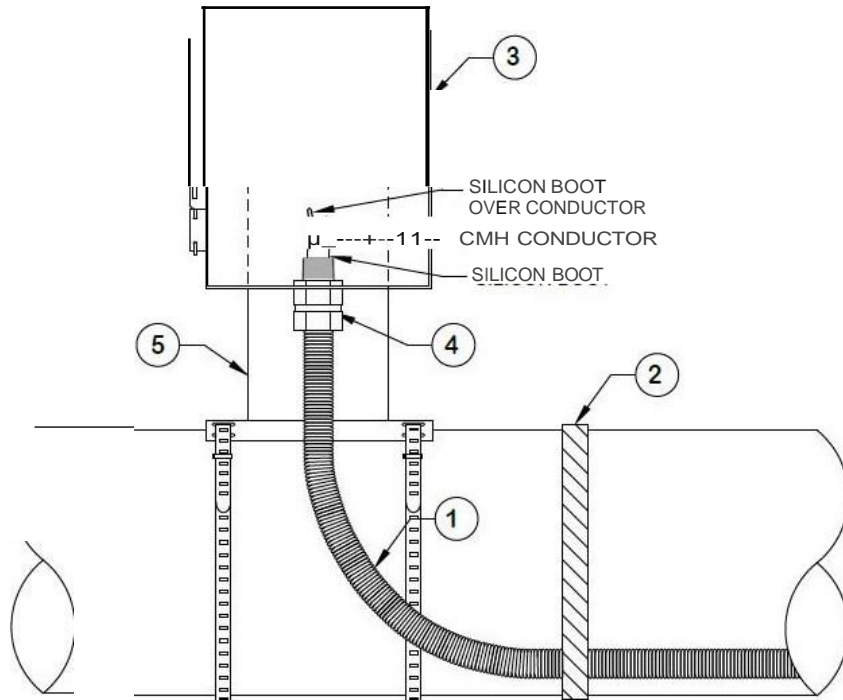


10. Use supplied pipe straps to secure the end seal to the pipe.

Note: if the pipe temperature exceeds 121• C (250°F), place the end seal above the insulation off the pipe.



ITEM	DESCRIPTION	QUANTITY
	PIPEGUARD CMH HEATER CABLE	
2	STAINLESS STEEL TIE WIRE	AS REQ'D
3	JUNCTION BOX. (AS SHOWN-DREXAN PART NUMBER HP-FG-JB)	
4	STRAIN RELIEF. DREXAN PART NO. CMH-CON (DREX0074)	
5	PIPE BRACKET. DREXAN PART NUMBER HP-BRAK-CMH	

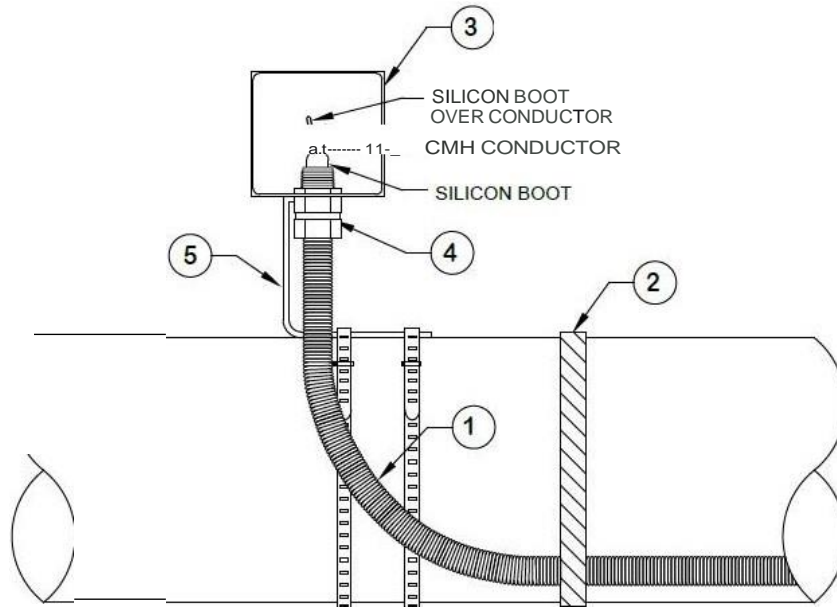


NOTES

- PIPEGUARD CMH HEATER CABLE IS CERTIFIED TO TERMINATE IN ANY APPROVED ENCLOSURE (JUNCTION BOX). ALL MATERIALS REQUIRED TO COMPLETE THE TERMINATION WITHIN A JUNCTION BOX ARE INCLUDED WITH THE STRAIN RELIEF GLAND (DREXAN PART NUMBER DREX0074).
- THE COLD LEAD (NON HEATED SECTION OF THE CABLE WHERE TERMINATED) IS EITHER 10 INCHES OR 20 INCHES, DEPENDING ON THE WATTAGE OUTPUT OF THE HEATING CABLE AND THE SUPPLY VOLTAGE. PLEASE REFER TO CMH-CON INSTALLATION INSTRUCTIONS.
- THE DREXAN HP-BRAK-CMH IS A BRACKET THAT CAN BE USED TO MOUNT ANY ENCLOSURE WITH A BOTTOM CABLE ENTRY EITHER DIRECTLY TO THE PIPE OR TO THE OUTSIDE OF THE INSULATION.
- WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED.
PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

6114 SHWHRWEFPARTI:EFEL:NCEOW+:ZD		DRAWN UC	mu
2	05/15/15 IOG00IAHGID	2011/05A-S	
1	05/15/15 NOTE F.4A00ID	000.0 -	
2	05/15/15 ITTMMOISCRPTIONOIra-D	ENGINEER	
RIVISDN		0111	SC,111 (11,1<NGH)
Trace Heating: Redfintd		INSTALL - CMH TERMINATION JUNCTION BOX	
		NTS	OWG014
			2

ITEM	DESCRIPTION	QUANTITY
	PIPEGUARD CMH HEATER CABLE	
2	STAINLESS STEEL TIE WIRE	AS REQ'D
3	JUNCTION BOX. STAHLIN PART NO. CF332 3"H x 3"W x 2.7"O (76mm X 76mm x 68.5mm)	
4	STRAIN RELIEF. DREXAN PART NUMBER DREX0074 CMH-CON	
5	PIPE BRACKET. DREXAN PART NUMBER HP-BRAK-CMH	



NOTES

- PIPEGUARD CMH HEATER CABLE IS CERTIFIED TO TERMINATE IN ANY APPROVED ENCLOSURE (JUNCTION BOX). ALL MATERIALS REQUIRED TO COMPLETE THE TERMINATION WITHIN A JUNCTION BOX ARE INCLUDED WITH THE STRAIN RELIEF GLAND (DREXAN PART NUMBER DREX0074).
- THE COLD LEAD (NON HEATED SECTION OF THE CABLE WHERE TERMINATED) IS EITHER 10 INCHES OR 20 INCHES, DEPENDING ON THE WATTAGE OUTPUT OF THE HEATING CABLE AND THE SUPPLY VOLTAGE. PLEASE REFER TO CMH-CON INSTALLATION INSTRUCTIONS.
- THE DREXAN HP-BRAK-CMH IS A BRACKET THAT CAN BE USED TO MOUNT ANY ENCLOSURE WITH A BOTTOM CABLE ENTRY EITHER DIRECTLY TO THE PIPE OR TO THE OUTSIDE OF THE INSULATION.
- WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED. PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

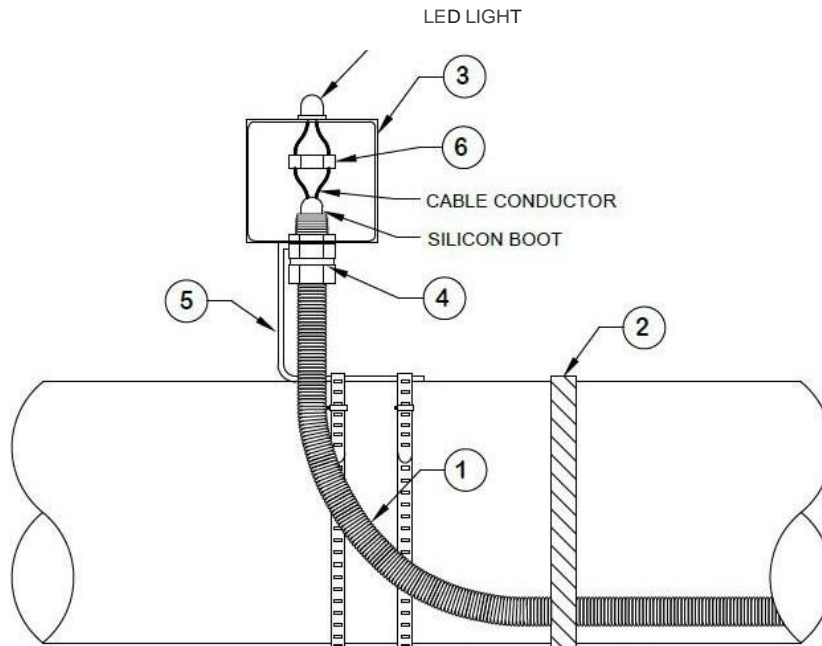
1	4116/0	S11WREUEFPAA1A:FEFENCEOIANSEO							
2	05/15/14	IOOO NGE0							
2	05/15/14	HOTE 14AOOID							
RIV		RVIS>JH							



**INSTALL - CMH TERMINATION
STAHLIN JUNCTION BOX**

SCALE NTS OV:111GNO DWG015 REV 2

ITEM	DESCRIPTION	QUANTITY
	PIPEGUARD CMH HEATER CABLE	
2	STAINLESS STEEL TIE WIRE	ASREQ'D
3	JUNCTION BOX. STAHLIN PART NO. 3.5"H x 3.5"W x 3"O (89mm x 89mm x 76mm)	
4	STRAIN RELIEF. OREXAN PART NO. CMH-CON (DREX0074)	
5	PIPE BRACKET. DREXAN PART NUMBER HP-BRAK-CMH	
6	LAMP TERMINAL BLOCK	

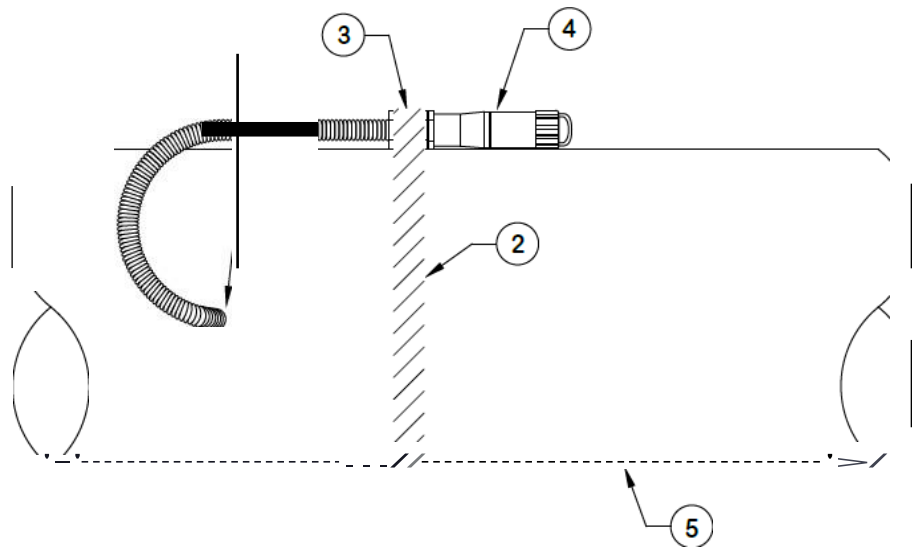


NOTES

1. THE CMH-LE 1/2R LIGHTED END SEAL IS CERTIFIED FOR HAZARDOUS APPLICATIONS UP TO CLASS DIVISION 2.
2. CMH-LE-1R IS RATED TO 120 VOLTS.
3. CMH-LE-2R IS RATED FROM 130 TO 277 VOLTS.
4. THE CMH-LE 1/2R KIT IS PIPE MOUNTED STANDING 10 INCHES (25 cm) FROM THE PIPE OR OUTER INSULATION CLADDING
5. THE CABLE CONDUCTORS CONNECT DIRECTLY INTO THE LAMP TERMINAL BOX.
6. WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED. PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

1	DWG017	STAINLESS STEEL TIE WIRE	ASREQ'D	0 11 20 11/06/01	Trt	<p style="text-align: center;">INSTALL - CMH LIGHTED END SEAL</p>
2	DS/IS/IS	IOGOOWGD		REFOID	STTT	
2	DS/IS/IS	NOTE16AODED		By/NEEA		
2	DS/IS/IS	n7M40ESCRPTIONCHAM.m		OTTT		
<p style="text-align: center;">t, h tN</p> <p style="text-align: center;">T-;ace Heatin& Rt:dt:flnt:d</p>			<p style="text-align: center;">SGILT</p>		<p style="text-align: center;">WWNGN-> DWG017</p>	
			<p style="text-align: center;">NTS</p>		<p style="text-align: center;">2</p>	

ITEM	DESCRIPTION	QUANTITY
	PipeGuard CMH HEATER CABLE EXITS INSULATION	
2	PIPE STRAP	AS REQ'D
3	STRAIN RELIEF. PART NO. CMH-CON (DREX0074)	
4	QUICK CONNECT SYSTEM	
5	OUTER PIPE INSULATOR	



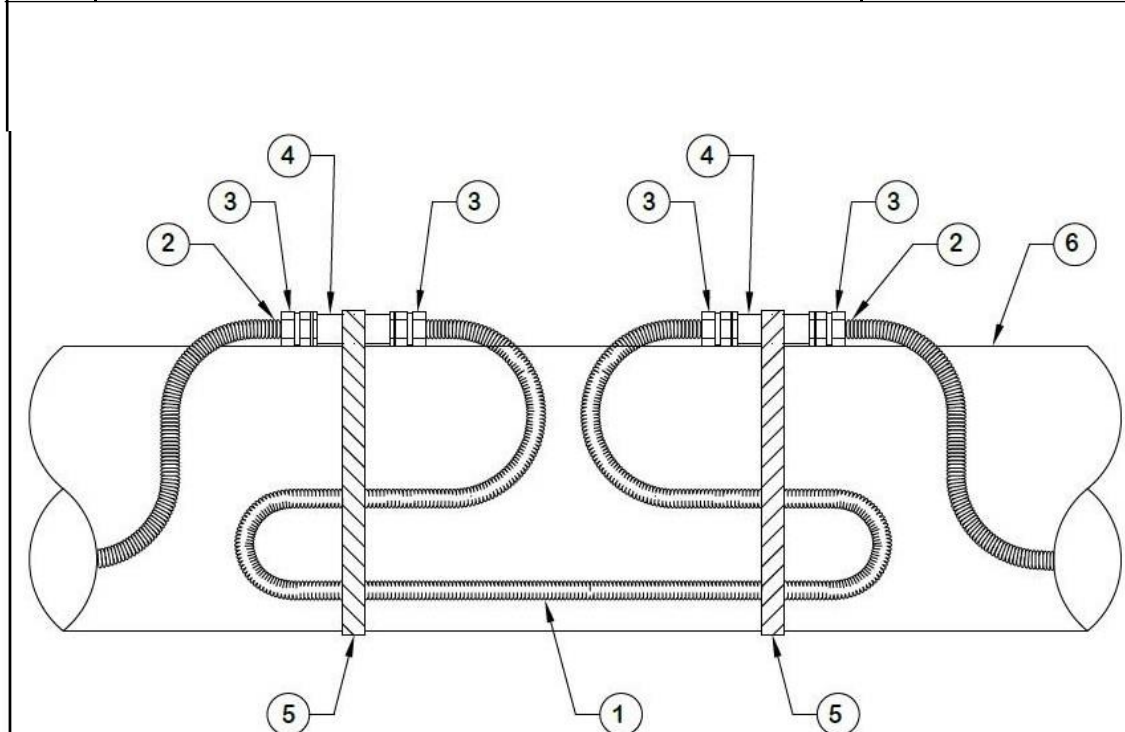
NOTES

1. PIPEGUARD CMH HEATER CABLE TERMINATION METHOD USING A QUICK CONNECT SYSTEM.
 2. A LOOP IN THE CABLE IS TO ELIMINATE STRESS PLACED ON THE CABLE/CONNECTOR.
 3. QUICK CONNECTORS MAY BE SUPPLIED BY DREXAN OR BY OTHERS.
 4. WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED.
- PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

1	04/16/20	STWNB/III/P/RTS/ERINCEOW-8	DRAWN	III	TITU	INSTALL - CMH QUICK TERMINATION
2	05/15/11	IOOOOANGW	1012	JOWS		
2	05/15/11	NOELJAOO/D	REVISION			
2	05/15/11	ITEMUOESCAIPTION01NQD	DATE			
RIV	OOE				SCALE	CRAWNGN-> OWG019 REV. 2




ITEM	DESCRIPTION	QUANTITY
	SPLICED IN SECTION OF CMH CABLE	
2	ENDS OF PREVIOUSLY INSTALLED CMH CABLE	2
3	PIPEGUARD CMH CABLE STRAIN RELIEF PN CMH-CON (DREX0074)	2
4	'C' TYPE METALLIC JUNCTION BOX OR OTHER APPROVED METALLIC ENCLOSURE	2
5	PIPE STRAP	2
6	PIPE INSULATION OUTER CLADDING	AS REQ'D



NOTES

1. CMH CABLE SPLICE IS INSTALLED OUTSIDE PIPE INSULATION AND CLADDING.
2. PIPE STRAPS (ITEM 5 ABOVE) ARE INSTALLED OVER THE PIPE INSULATION AND CLADDING.
3. REFER TO INSTALLATION INSTRUCTIONS FOR DREX0074 (CMH-CON)
4. WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED. PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

1	SIWNN.JT:PPAAT:EFERINCEow+ZD	DRAWN IBC	mu
2	IOGQQ-W::;D	2012.08.07	
2	NOTEUAOOED		
2	ntMUOESCRPTJNOIAt+.LD		
	RIVISDN		



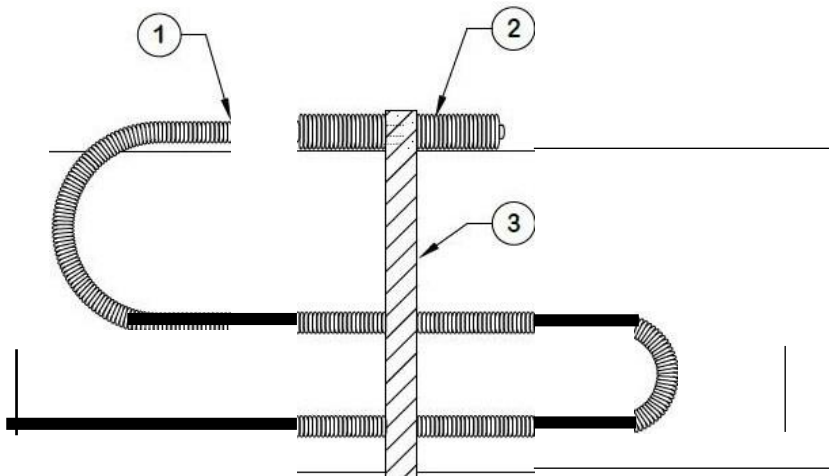
Trace Heating
Redfintd

TYPICAL CMH SPLICE

NTS DWG020

2

ITEM	DESCRIPTION	QUANTITY
	PipeGuard CMH HEATER CABLE	AS REQ'D
2	CMH-LP-E (DREX0075) Low Profile End Seal	
3	Pipe Strap	2



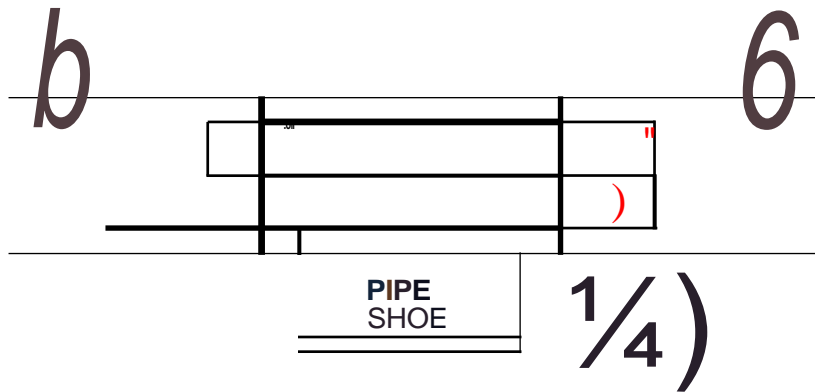
NOTES

1. ON A PIPE HOTTER THAN 121 DEGREES C (250F) MOUNT THE CMH-LP-E (DREX0075) OFF THE PIPE OVER THE INSULATION
2. CMH-LP-E (DREX0075) IS CSA/CUS CERTIFIED UP TO CLASS I DIV.2 (ZONE 2)
3. THE NON-HEATED SECTION OF THE CABLE END IS EITHER 10" OR 20" DEPENDING ON THE WATTAGE OUTPUT. REFER TO INSTRUCTIONS.
4. WHERE MULTIPLE RUNS OR LOOPS OF A CONSTANT WATTAGE HEATER CABLE (SERIES MI AND PIPEGUARD CMH) ARE APPLIED TO PIPE SHOES AND SUPPORTS, CARE MUST BE TAKEN TO ENSURE THAT EXCESSIVE HEAT IS NOT GENERATED. DEPENDING IN PART UPON THE PIPE DIAMETER, IT MAY NOT BE NECESSARY TO INSTALL MULTIPLE RUNS OF CABLE AT A PIPE SHOE. CABLE WATTAGE OUTPUT MUST BE CONSIDERED. PLEASE REFER TO NOTE #1 ON INSTALLATION DRAWING 22.

				DRAWN MRC BY WE 1015/06/15	TITLE
				CHECKED - DATE	INSTALL - CMH LOW PROFILE END SEAL
				APPROVED - DATE	
AV		RVISION		Tr.;i,ce He.itnliil Aede:ftn.ed	SOU NTS OV.WNGN>> DWG021
					0

ITEM	DESCRIPTION	QUANTITY
1	PIPEGUARD CMH CABLE	AS REQ'D
2	SS TIE WIRE	AS REQ'D

SHOE LENGTH (mm)	CABLE ADDED PER PASS (mm)	TOTAL LENGTH APPLIED (mm)
300 (12")	900 (36")	1200 (48")
450 (18")	1350 (54")	1800 (72")
600 (24")	1800 (72")	2400 (96")
750 (30")	2250 (90")	3000 (120")
900 (36")	2700 (108")	3600 (144")



NOTES

- EXTRA CABLE IS REQUIRED FOR PIPES SIZED FROM 50mm (2") TO 203mm (10"). PIPES SMALLER THAN 50mm (2") AND LARGER THAN 203mm (10") DO NOT REQUIRE EXTRA CABLE.

IMPORTANT; THE REQUIREMENT FOR SUPPLEMENTAL HEATING IS BASED ON THE ASSUMPTION THAT THE WATTAGE OUTPUT OF THE INSTALLED HEATING CABLE IS NOT HIGHER THAN WHAT WAS SPECIFIED BY THE HEAT LOSS CALCULATION. OTHERWISE THE MULTIPLIER AFFECT OF THE ADDITIONAL LENGTHS OF HEATER INCREASES THE RISK THAT THE CABLE WILL EXCEED ITS PUBLISHED WITHSTAND TEMPERATURE, WHICH MAY RESULT IN FAILURE. FOR EXAMPLE, IF A 30 WATT PER FOOT HEATER IS INSTALLED WHERE THE ENGINEERING DESIGN CALLS FOR ONLY 10 WATTS PER FOOT THEN THE HEAT BEING APPLIED AT EACH SHOE WILL BE SO WATTS RATHER THAN 30 WATTS PER FOOT.

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			OIEOIO .	PIPEGUARO CMH HEATING CABLE
			E 1011 1111111111	RECOMMENDED INSTALLATION ON A PIPESHOE
			O III	SCAII NTS (1 TH NNGN)
RIV 00E	RMSJUN	t19e fi b Tr.tee Heating Redefined		OWS022

