## ELECTRICAL SWITCHES

The electrical switches are intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices and other electrical devices that are designed to shut off or turn on when the system is actuated.

Switches are available in kits: One Switch Kit, Part No. 551154; Two Switch Kit, Part No. 551155; Three Switch Kit, Part No. 551156, and Four Switch Kit, Part No. 551157. Mounting hardware and 12 in. wire assemblies are provided with each kit. Each switch has a set of single-pole, double-throw contacts rated:

| UL/cUL/CSA Rating | ENEC Rating |
|---|---|
| 250 VAC, 21A Resistive | IE4T105μ Approved |
| 250 VAC, 2 HP | 250V, 21A Resistive |
| 125 VAC, 1 HP | 8A Motor Load |

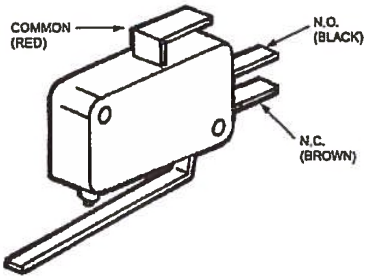


Figure 2-20a. Model MS-SPDT Micro Switch.
001812

The Alarm Initiating Switch Kit, Part No. 550077, can be field mounted within the control head. This switch must be used to close a supervised alarm circuit to the building main fire alarm panel when the control head actuates. This action will signal the fire alarm panel that there was a system actuation in the hazard area. The switch kit contains all necessary mounting components along with a mounting instruction sheet. The switch is rated 50 mA, 28 VDC.

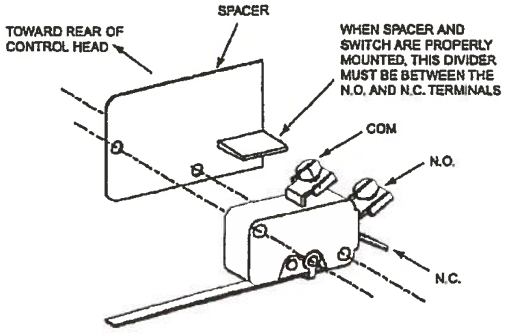


Figure 2-20b. Alarm Initiating Switch.
004890

See NFPA 72, "National Fire Alarm Code," Initiating Devices section, for the correct method of wiring connection to the fire alarm panel.

## MODEL SM-120/24 SOLENOID MONITOR

The Model SM-120/24 solenoid monitor is used in conjunction with the Model ECH3 control head to supervise the actuation and detection circuits. In the event of a problem in the circuit, a light on the monitor goes out. The Model SM-120 is used with the Model ECH3-120 control head. The Model SM-24 is used with the Model ECH3-24 control head. Two sets of NO/NC dry contacts are provided. The unit mounts directly to a three gang wall outlet box. The Model SM-120 acts as a reset relay when used with an electric gas valve. Electric gas valve wiring instructions are provided in the installation section of this manual. See Figure 2-21.

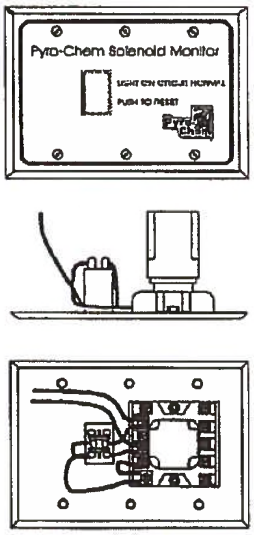


Figure 2-21. Model SM-24/120 Solenoid Monitor.
002860PC

## COMPONENT LIST
## GENERAL PURPOSE SYSTEM

| MODEL NO. | DESCRIPTION | PART NO. |
|---|---|---|
| PCI-15ABC | 15 lb. ABC Cylinder and Valve Assembly | 550388 |
| PCI-17ABC | 17 lb. ABC Cylinder and Valve Assembly | 551654 |
| PCI-25sBC | 25 lb. BC Cylinder and Valve Assembly | 550391 |
| PCI-25sABC | 25 lb. ABC Cylinder and Valve Assembly | 550390 |
| PCI-35ABC | 35 lb. ABC Cylinder and Valve Assembly | 551097 |
| PCI-50sBC | 50 lb. BC Cylinder and Valve Assembly | 550393 |
| PCI-50sABC | 50 lb. ABC Cylinder and Valve Assembly | 550392 |
| PCI-70ABC | 70 lb. ABC Cylinder and Valve Assembly | 551094 |
| PAC-10 | Pneumatic Actuating Cylinder | 550104 |
| PAC-200 | Pneumatic Actuating Cylinder | 550690 |
| MB-P2 | Control Head Mounting Bracket | 550853 |
| MB-15 | Mounting Bracket (PCI-15,17,25s Cylinders) | 550054 |
| MB-1 | Mounting Bracket (PCI-35,70 Cylinders) | 550053 |
| MB-U8 | 8 In. Unistrut Mounting Bracket | 550324 |
| MB-U10 | 10 in. Unistrut Mounting Bracket | 550383 |
| MB-U12 | 12 In. Unistrut Mounting Bracket | 550638 |
| MCH3 | Mechanical Control Head | 551200 |
| NMCH3 | Mechanical Control Head | 551203 |
| ECH3-24 | 24VDC Electrical Control Head | 551201 |
| ECH3-120 | 120VDC Electrical Control Head | 551202 |
| – – – | 8 In. S.S. Actuation Hose | 417582 |
| – – – | 16 In. S.S. Actuation Hose | 31809 |
| – – – | 24 In. S.S. Actuation Hose | 32336 |
| – – – | 42 In. S.S. Actuation Hose | 430815 |
| – – – | Male Elbow | 31810 |
| – – – | Male Tee | 31811 |
| – – – | Male Straight Connector | 32338 |
| PDA-D2 | Pneumatic Actuating Adaptor | 550829 |
| – – – | Swing Check Valve | 417788 |
| NF-ABC | Nozzle Assembly | 551678 |
| N-LA-ABC | Nozzle Assembly | 550646 |
| N-LA-BC | Nozzle Assembly | 550342 |
| N-TS | Nozzle Assembly | 550337 |
| RPS-M | Remote Mechanical Pull Station | 551074 |
| RPS-E2 | Remote Electric Pull Station | 551166 |
| FKL-1 | 10 In. Fusible Link Bracket | 550131 |
| FKL-1A | 8 In. Fusible Link Bracket | 550132 |
| FLH-25 | Fusible Link Hanger (25) | 550876 |
| FL-165 | 165° F Fusible Link | 550368 |
| FL-212 | 212° F Fusible Link | 550365 |
| FL-280 | 280° F Fusible Link | 550366 |
| FL-360 | 360° F Fusible Link | 550009 |
| FL-450 | 450° F Fusible Link | 550367 |
| FL-500 | 500° F Fusible Link | 56816 |
| SM-24 | 24VDC Solenoid Monitor | 550303 |
| SM-120 | 120VAC Solenoid Monitor | 550302 |
| TD-140 | 140° F Thermal Detector | 550351 |
| TD-190 | 190° F Thermal Detector | 550352 |
| TD-225 | 225° F Thermal Detector | 550353 |
| TD-325 | 325° F Thermal Detector | 550354 |
| TD-450 | 450° F Thermal Detector | 550355 |
| TD-600 | 600° F Thermal Detector | 550356 |
| GV-75 | 3/4 In. Mechanical Gas Valve | 550593 |
| GV-100 | 1 In. Mechanical Gas Valve | 550594 |

**COMPONENT LIST**
**GENERAL PURPOSE SYSTEM (Continued)**

| MODEL NO. | DESCRIPTION | PART NO. |
|---|---|---|
| GV-125 | 1 1/4 In. Mechanical Gas Valve | 550595 |
| GV-150 | 1 1/2 In. Mechanical Gas Valve | 550596 |
| GV-200 | 2 In. Mechanical Gas Valve | 551049 |
| GV-250 | 2 1/2 In. Mechanical Gas Valve | 550185 |
| GV-300 | 3 in. Mechanical Gas Valve | 550186 |
| EGVSO-75 | 3/4 in. Electric Gas Valve | 550358 |
| EGVSO-100 | 1 In. Electric Gas Valve | 550359 |
| EGVSO-125 | 1 1/4 In. Electric Gas Valve | 550360 |
| EGVSO-150 | 1 1/2 in. Electric Gas Valve | 550361 |
| EGVSO-200 | 2 In. Electric Gas Valve | 550362 |
| EGVSO-250 | 2 1/2 In. Electric Gas Valve | 550363 |
| EGVSO-300 | 3 In. Electric Gas Valve | 550385 |
| MS-SPDT | Micro-Switch – Single Pole Double Throw | 551154 |
| MS-DPDT | Micro-Switch – Double Pole Double Throw | 551155 |
| MS-3PDT | Micro-Switch – 3 Pole Double Throw | 551156 |
| MS-4PDT | Micro-Switch – 4 Pole Double Throw | 551157 |
| – – – | Alarm Initiating Switch | 550077 |
| PS-SPDT-XP | Pressure Switch – Single Pole Double Throw | 550052 |
| CO2-6 | 6 x $CO_2$ Cartridge | 551059 |
| CBP-1 | Compression Bearing Corner Pulley | 423250 |
| SBP-1 | Screw Bearing Corner Pulley | 415670 |
| WBP-1 | Weather Proof Corner Pulley (10 Per Package) | 550983 |
| TP-1 | Tee Pulley | 550166 |
| WC-100 | Oval Sleeve Crimps (100 Per Package) | 550122 |
| – – – | Stop Sleeves (Pack of 10) | 24919 |
| – – – | Valve – Piston O-Ring | 550636 |
| – – – | Valve – Stem Washer | 550284 |
| – – – | Valve – Seat Washer | 550021 |
| – – – | Valve – Stem Head | 550020 |
| – – – | Valve – Body O-Ring | 550029 |
| – – – | Valve – Pressure Gauge | 550025 |
| – – – | Valve – Stem | 550806 |
| – – – | Valve – Stem O-Ring | 550028 |
| – – – | Valve – Conical Spring | 550022 |
| – – – | Valve – Piston | 550805 |
| FR-25sBC | Flow Restrictor | 550235 |
| – – – | Pressure Bleed Down Adaptor Assembly | 551736 |
| – – – | Dry Valve Rebuilding Kit | 550037 |
| – – – | Recharge Adaptor | 550130 |
| – – – | Dry Valve Hydrotest Adaptor | 552182 |

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# CHAPTER 3

# DESIGN

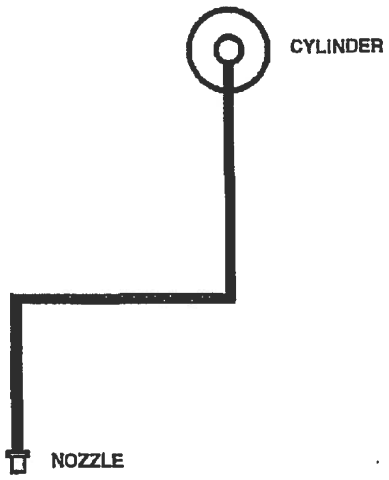
TABLE 3-1

## Total Flooding Nozzle Protection Chart

Maximum Dimensions in feet/nozzle for one (1) Model NF-ABC

| Side 1 (ft.) | Nozzle Height (ft.) | Maximum Side 2 (ft.) | Side 1 (ft.) | Nozzle Height (ft.) | Maximum Side 2 (ft.) | Side 1 (ft.) | Nozzle Height (ft.) | Maximum Side 2 (ft.) | Side 1 (ft.) | Nozzle Height (ft.) | Maximum Side 2 (ft.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 8 | 16.70 | 7 | 8 | 15.46 | 11 | 8 | 12.92 | 15 | 8 | 7.94 |
| | 9 | 16.70 | | 9 | 15.46 | | 9 | 12.92 | | 9 | 7.94 |
| | 10 | 16.70 | | 10 | 15.46 | | 10 | 11.78 | | 10 | 7.94 |
| | 11 | 16.70 | | 11 | 15.46 | | 11 | 10.71 | | 11 | 7.85 |
| | 12 | 16.70 | | 12 | 15.43 | | 12 | 9.82 | | 12 | 7.20 |
| | 13 | 16.70 | | 13 | 14.24 | | 13 | 9.06 | | 13 | 6.65 |
| | 14 | 16.70 | | 14 | 13.22 | | 14 | 8.42 | | 14 | 6.17 |
| | 15 | 16.70 | | 15 | 12.34 | | 15 | 7.85 | | 15 | 5.76 |
| | 16 | 16.70 | | 16 | 11.57 | | 16 | 7.36 | | 16 | 5.40 |
| | 17 | 16.70 | | 17 | 10.89 | | 17 | 6.93 | | 17 | 5.08 |
| | 18 | 16.70 | | 18 | 10.29 | | 18 | 6.55 | | 18 | 4.80 |
| | 19 | 16.70 | | 19 | 9.74 | | 19 | 6.20 | | 19 | 4.55 |
| | 20 | 16.70 | | 20 | 9.26 | | 20 | 5.89 | | 20 | 4.32 |
| 4 | 8 | 16.49 | 8 | 8 | 14.97 | 12 | 8 | 12.00 | 16 | 8 | 5.66 |
| | 9 | 16.49 | | 9 | 14.97 | | 9 | 12.00 | | 9 | 5.66 |
| | 10 | 16.49 | | 10 | 14.97 | | 10 | 10.80 | | 10 | 5.66 |
| | 11 | 16.49 | | 11 | 14.73 | | 11 | 9.82 | | 11 | 5.66 |
| | 12 | 16.49 | | 12 | 13.50 | | 12 | 9.00 | | 12 | 5.66 |
| | 13 | 16.49 | | 13 | 12.46 | | 13 | 8.31 | | 13 | 5.66 |
| | 14 | 16.49 | | 14 | 11.57 | | 14 | 7.71 | | 14 | 5.66 |
| | 15 | 16.49 | | 15 | 10.80 | | 15 | 7.20 | | 15 | 5.40 |
| | 16 | 16.49 | | 16 | 10.13 | | 16 | 6.75 | | 16 | 5.06 |
| | 17 | 16.49 | | 17 | 9.53 | | 17 | 6.35 | | 17 | 4.76 |
| | 18 | 16.49 | | 18 | 9.00 | | 18 | 6.00 | | 18 | 4.50 |
| | 19 | 16.49 | | 19 | 8.53 | | 19 | 5.68 | | 19 | 4.26 |
| | 20 | 16.20 | | 20 | 8.10 | | 20 | 5.40 | | 20 | 4.05 |
| 5 | 8 | 16.22 | 9 | 8 | 14.39 | 13 | 8 | 10.91 | | | |
| | 9 | 16.22 | | 9 | 14.39 | | 9 | 10.91 | | | |
| | 10 | 16.22 | | 10 | 14.39 | | 10 | 9.97 | | | |
| | 11 | 16.22 | | 11 | 13.09 | | 11 | 9.06 | | | |
| | 12 | 16.22 | | 12 | 12.00 | | 12 | 8.31 | | | |
| | 13 | 16.22 | | 13 | 11.08 | | 13 | 7.67 | | | |
| | 14 | 16.22 | | 14 | 10.29 | | 14 | 7.12 | | | |
| | 15 | 16.22 | | 15 | 9.60 | | 15 | 6.65 | | | |
| | 16 | 16.20 | | 16 | 9.00 | | 16 | 6.23 | | | |
| | 17 | 15.25 | | 17 | 8.47 | | 17 | 5.86 | | | |
| | 18 | 14.40 | | 18 | 8.00 | | 18 | 5.54 | | | |
| | 19 | 13.64 | | 19 | 7.58 | | 19 | 5.25 | | | |
| | 20 | 12.96 | | 20 | 7.20 | | 20 | 4.98 | | | |
| 6 | 8 | 15.87 | 10 | 8 | 13.71 | 14 | 8 | 9.59 | | | |
| | 9 | 15.87 | | 9 | 13.71 | | 9 | 9.59 | | | |
| | 10 | 15.87 | | 10 | 12.96 | | 10 | 9.26 | | | |
| | 11 | 15.87 | | 11 | 11.78 | | 11 | 8.42 | | | |
| | 12 | 15.87 | | 12 | 10.80 | | 12 | 7.71 | | | |
| | 13 | 15.87 | | 13 | 9.97 | | 13 | 7.12 | | | |
| | 14 | 15.43 | | 14 | 9.26 | | 14 | 6.61 | | | |
| | 15 | 14.40 | | 15 | 8.64 | | 15 | 6.17 | | | |
| | 16 | 13.50 | | 16 | 8.10 | | 16 | 5.79 | | | |
| | 17 | 12.71 | | 17 | 7.62 | | 17 | 5.45 | | | |
| | 18 | 12.00 | | 18 | 7.20 | | 18 | 5.14 | | | |
| | 19 | 11.37 | | 19 | 6.82 | | 19 | 4.87 | | | |
| | 20 | 10.80 | | 20 | 6.48 | | 20 | 4.63 | | | |

PCI-17ABC with 1 nozzle



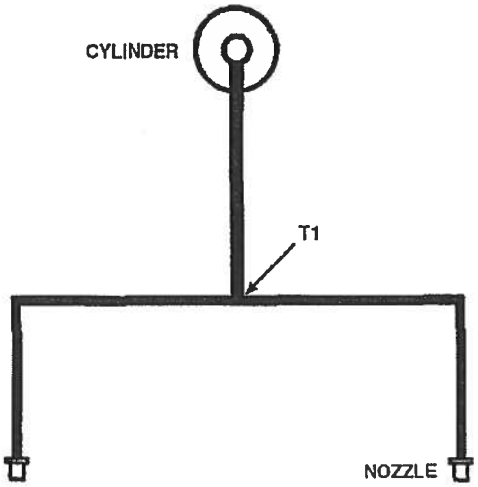

Total Flooding Piping Limits PCI-17ABC

| Cylinder Size | Nozzle Quantity | Nozzle Type | Piping Section | Size | Length Maximum | Elbows Maximum |
|---|---|---|---|---|---|---|
| ▸ PCI-17ABC | 1 | NF-ABC | Cylinder to Nozzle | 3/4 in. | 30 ft. | 4 |

NOTE:

1. PCI-17ABC uses one (1) NF-ABC nozzle.
▸ 2. A Main/Reserve Swing Check Valve, Part No. 417788, may be located between the cylinder and T1.

**PCI-35ABC with 2 nozzles**



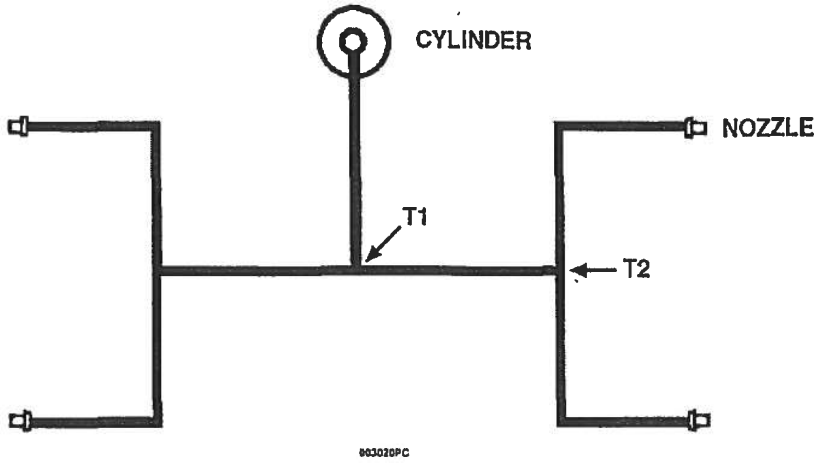

**Total Flooding Piping Limits PCI-35ABC**

| Cylinder Size | Maximum Nozzle Quantity | Nozzle Type | Piping Section | Size | Length Maximum | Elbows Maximum |
|---|---|---|---|---|---|---|
| PCI-35ABC | 2 | NF-ABC | Cylinder to T1 | 3/4 in. | 30 ft. (9.1 m) | 4 |
| | | | T1 to Nozzle | 3/4 in. | 9 ft. (2.7 m) | 2 |

**NOTE:**

1. PCI-35ABC must always use two (2) NF-ABC nozzles.
2. System piping must be balanced. Balanced piping is that in which the difference between the shortest actual pipe length from T1 to nozzle and the longest actual pipe length from T1 to nozzle does not exceed 10% of the longest actual pipe length from T1 to nozzle. The number and type of fittings from all last tee to nozzle sections must be equal.
3. A Main/Reserve Swing Check Valve, Part No. 417788, may be located between the cylinder and T1.

**PCI-70ABC with 4 nozzles**




**Total Flooding Piping Limits PCI-70ABC**

| Cylinder Size | Maximum Nozzle Quantity | Nozzle Type | Piping Section | Size | Length Maximum | Elbows Maximum |
|---|---|---|---|---|---|---|
| PCI-70ABC | 4 | NF-ABC | Cylinder to T1 | 1 in. | 30 ft. (9.1 m) | 3 |
| | | | T1 to T2 | 1 in. | 14 ft. (4.3 m) | 2 |
| | | | T2 to Nozzle | 3/4 in. | 9 ft. (2.7 m) | 2 |

NOTE:

1. PCI-70ABC must always use four (4) NF-ABC nozzles.
2. System piping must be balanced. Balanced piping is that in which the difference between the shortest actual pipe length from T1 to nozzle and the longest actual pipe length from T1 to nozzle does not exceed 10% of the longest actual pipe length from T1 to nozzle. T2 to nozzle on the same branch must not exceed 10% of each other. The number and type of fittings from all last tee to nozzle sections must be equal.
3. A Main/Reserve Swing Check Valve, Part No. 417788, may be located between the cylinder and T1.

## Detector Placement.

Thermal detectors are required in all hazard areas protected by the PYRO-CHEM Industrial Fire Suppression Systems if automatic system operation is required. Either mechanical or electrical thermal detectors can be used for automatic system operation. Mechanical detectors (fusible links) are used in conjunction with the PYRO-CHEM Models MCH3 and NMCH3 control devices. Electrical detectors are used in conjunction with the PYRO-CHEM Models ECH3-24 and ECH3-120 Control Heads.

TOTAL FLOODING (DETECTOR SPACING) – THERMAL

| Ceiling Height | Spacing |
|---|---|
| Up to 14 ft. (4.2 m) Height | 15 ft. (4.5 m) maximum between detectors<br>7 ft. 6 in. (2.3 m) max. from wall<br>225 sq. ft. (20.9 sq. m) max. coverage per detector |
| Greater than 14 ft. (4.2 m) up to 20 ft. (6.1 m) height | 13 ft. (3.9 m) maximum between detectors<br>6 ft. 6 in. (1.9 m) max. from wall<br>169 sq. ft. (15.7 sq. m) max. coverage per detector |
| Greater than 20 ft. (6.9 m) up to 24 ft. (7.3 m) | 11 ft. (3.4 m) max. between detectors<br>5 ft. 6 in. (1.7 m) max. from wall<br>121 sq. ft. (11.2 sq. m) max. coverage per detector |
| Greater than 24 ft. (7.3 m) up to 30 ft. (9.1 m) | 9 ft. (2.7 m) max. between detectors<br>4 ft. 6 in. (1.4 m) max. from wall<br>81 sq. ft. (7.5 sq. m) max. coverage per detector |

NOTE: For sloped ceiling (peaked type or shed type) installations, refer to NFPA-72, "National Fire Alarm Code" for detailed spacing requirements.

LOCAL APPLICATION – OVERHEAD (DETECTOR SPACING) – Maximum spacing per detector is 100 ft.$^2$ (9.3 m$^2$) or 5 ft. (1.5 m) from edge of hazard and 10 ft. (3.1 m) between detectors. When detectors are mounted below the ceiling in an open area, heat traps are recommended.

LOCAL APPLICATION – TANKSIDE (DETECTOR SPACING) – Detectors can be located either near the inner tank wall and flammable liquid surface or above the tank. If located above the tank, the rules for local application overhead would apply. If located on the tank wall, the detectors can be mounted horizontally or vertically in the freeboard area, but must be protected from damage during normal working operations. The maximum spacing per detector is 5 ft. (1.5 m) from edge of hazard and 10 ft. (3.1 m) between detectors.

A temperature survey must be performed to determine the maximum ambient temperature of the hazard survey. See Temperature Chart in Chapter 2 – Components.

TOTAL FLOODING (DETECTOR SPACING) – FUSIBLE LINKS

| Ceiling Height | Spacing |
|---|---|
| Up to 14 ft. (4.2 m) Height | 10 ft. (3.0 m) maximum detectors<br>5 ft. (1.5 m) max. from a wall*<br>100 sq. ft. (9.2 sq. m) max. coverage per detector |
| Greater than 14 ft. (4.2 m) up to 20 ft. (6.1 m) height | 8 ft. (2.4 m) max. between detectors<br>4 ft. (1.2 m) max. from wall<br>64 sq. ft. (5.9 sq. m) max. coverage per detector |

NOTE: For sloped ceiling (peaked type or shed type) installations, refer to NFPA-72, "National Fire Alarm Code" for detailed spacing requirements.

LOCAL APPLICATION – OVERHEAD (DETECTOR SPACING) – Maximum spacing per fusible link detector is 36 ft.$^2$ (3.3 m$^2$) or 3 ft. (.9 m) from edge of hazard and 6 ft. (1.8 m) between fusible link detectors.

When a detector(s) is mounted more than 1 ft. (.3 m) below ceiling or in an open area, heat trap(s) is recommended. Detectors should be mounted overhead at nozzle height or as close to the hazard as possible without interference, not to exceed 10 ft. (3 m).

Detectors should not be located where they will be susceptible to damage during the normal work operation.

LOCAL APPLICATION – TANKSIDE (DETECTOR SPACING) – Detectors can be located either near the inner tank wall and flammable liquid surface or above the tank. If located above the tank, the rules for local application overhead would apply. If located on the tank wall, the detectors can be mounted horizontally or vertically in the freeboard area but must be protected from damage during normal working operation. Detectors should be located at a maximum spacing per detector of 3 ft. (.9 m) from edge of hazard and 6 ft. (1.8 m) between detectors on the long side of the tank.

*For 14 ft. (4.3 m) wide booths with maximum height of 12 ft. (3.7 m), the detector location off the side wall can be a maximum of 7 ft. (2.1 m).

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# CHAPTER 4

# INSTALLATION

# CHAPTER IV
## SYSTEM INSTALLATION

This chapter will detail the basic information necessary for proper installation of the PYRO-CHEM Industrial Fire Suppression System. However, before attempting any installation it is necessary to attend a Factory Certification Training Class and become Certified to install the PYRO-CHEM Industrial Fire Suppression System.

Pipe and fittings for the discharge piping, conduit (EMT), pipe straps, pipe hangers, mounting bolts, and other miscellaneous equipment are not furnished as part of the PYRO-CHEM Industrial Fire Suppression System. These items must be furnished by the installer.

Before attempting any installation, unpack the entire system and check that all necessary parts are on hand. Inspect parts for damage. Verify that cylinder pressure is within the acceptable range as shown on the gauge.

## CYLINDER INSTALLATION

The cylinder and valve assembly is shipped with an anti-recoil plug in the valve discharge port.

> **CAUTION**
> The anti-recoil plug must remain in the valve discharge port until the discharge piping is connected to the valve.

The cylinder must be mounted vertically with the discharge port facing either left or right. The Models PCI-17 and PCI-25 cylinders must be mounted using a Model MB-15 Mounting Bracket Kit. The Model PCI-35, PCI-50, PCI-70, and PCI-cylinders must be mounted using a Model MB-1 Mounting Bracket Kit.

The bracket must be securely anchored to the wall using bolts or lag screws. The wall to which the bracket is attached must be sufficiently strong to support the cylinder. The bracket should never be fastened to dry wall or similar material. If this type of wall is encountered, studs must be located and the bracket fastened to them. See Figure 4-1.

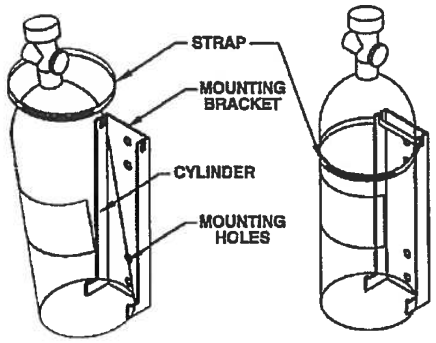


Figure 4-1. Cylinder and Mounting Bracket Installation.
002871PC

## CONTROL HEAD INSTALLATION

### 1. Single Cylinder Installations.

For single cylinder system installations the Model MCH3/ECH3/NMCH3 Control Head can be installed directly onto the cylinder valve. When the control head is properly aligned in the desired position, tighten the knurled locking ring to secure the assembly. See Figure 4-2.

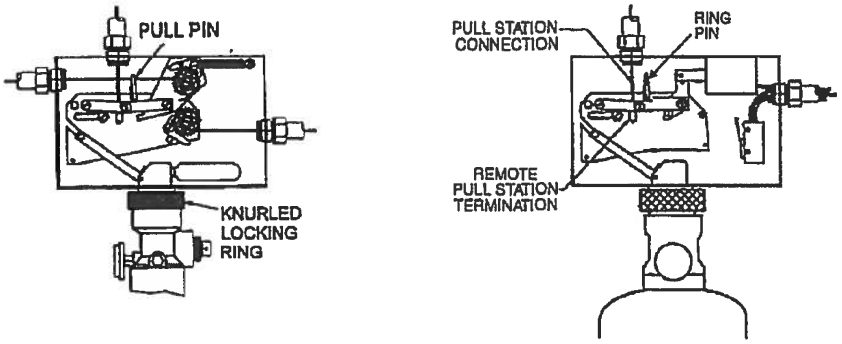


Figure 4-2. Single Cylinder Installation Using Model MCH3/ECH3/NMCH3 Control Head
002872PC/000647PC

# FUSIBLE LINK DETECTOR INSTALLATION

Fusible links are always used in conjunction with the Model MCH3 Mechanical Control Head. After mounting the cylinder and control head, the fusible link line can be installed. The first step to installing the fusible link line is to install the detector bracket(s). These brackets must be installed in the plenum area, hazard area, and in each duct. See Chapter III for detector placement guidelines.

**Note: Only ML-style Fusible Links can be used.**

▸ Connect the fusible link brackets together using 1/2 in. conduit and the conduit connectors supplied in the detector kit (Model FLK-1/1A). A PYRO-CHEM corner pulley must be used whenever a change in conduit direction is necessary. The conduit is connected to the control head through a knockout in the upper left-side corner.

In general, fusible links centered in the detector brackets ▸ are connected in series using 1/16 in. diameter stainless steel cable. The spring plate in the control head maintains tension on this series of fusible links. If the tension is released for any reason (i.e., a fusible link separates), the control head will operate and actuate the system. Maximum limitations for the fusible link detection line are as follows:

Fusible links can be installed with or without fusible link hangers (see Chapter II for description).

| Fusible Link Line Limitations When Used With Model MCH3 and NMCH3 Control Heads and Part No. 415670 and 423250 Pulley Elbows | |
|---|---|
| Maximum # of Detectors: | 20 |
| ▸ Maximum length of cable: | 150 ft. (45.7 m) |
| Maximum # of pulleys: | 40 |

## 1. Fusible Link Installation Without Hangers.

Begin installing links at the terminal bracket. The link is connected to the far side of the terminal bracket using an "S" hook. The "S" hook must be crimped closed after the link is installed. A tight loop is then made in the cable and secured by the crimp provided. This loop is connected to the other side of the terminal link (see Figure 4-6) and the cable fed through the conduit to the next bracket. The cable proceeding from the terminal link will be used to connect the series links (see Figure 4-7). Series links must be centered in their detector brackets.

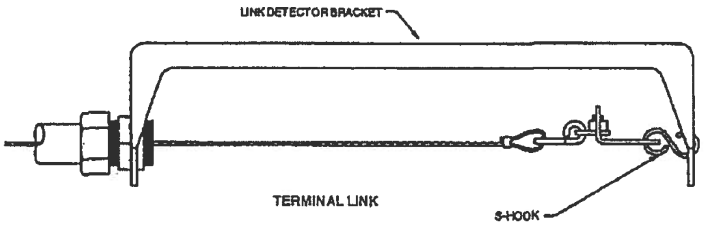


Figure 4-6. Terminal Link Installation.
002846aPC

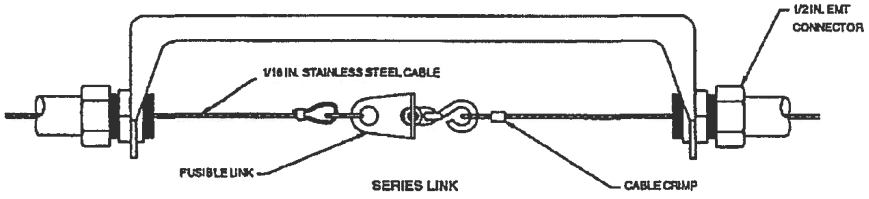


Figure 4-7. Series Link Installation.
002846bPC

After the last link in the series is connected, the cable should be fed through the conduit back to the control head. Thread the cable through the hole in the fusible link ratchet wheel. The line must then be crimped, and the crimp positioned inside the center of the ratchet wheel.

**NOTE**

Crimps must always be used in conjunction with two (2) cable lengths. Loops are the accepted method of connecting the cable to mechanical components. The crimp must never be used on a single cable. Exception: Single cable crimp allowed in detection and gas valve ratchet wheel using stop sleeve, Part No. 26317 (packages of 10: Part No. 24919).

The fusible link line can now be put into a set position by applying tension to the fusible link line. This is accomplished by using a 1/2 in. hex wrench on the fusible link line ratchet wheel. The ratchet wheel will be ratcheted in a clockwise direction until the spring plate makes contact with the top of the control head box. The fusible link line is now in a set position. See Figure 4-8.

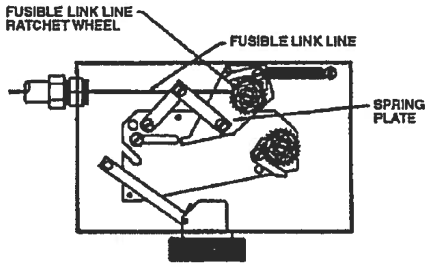


Figure 4-8. Fusible Link Line Termination.
002676PC

## 2. Fusible Link Installation Using Model FLH-1 Fusible Link Hangers.

Beginning at the control head, feed the stainless steel cable through the conduit and brackets to the terminal bracket in one continuous length. Allow approximately 2.5 in. (6.4 cm) of slack at each bracket for the installation of the Fusible Link Hangers. At the terminal link, a tight loop is made in the cable and secured by the crimp provided. The cable is attached to the far side of the terminal bracket using an "S" hook. The "S" hook must be crimped closed after the cable is installed. See Figure 4-9.

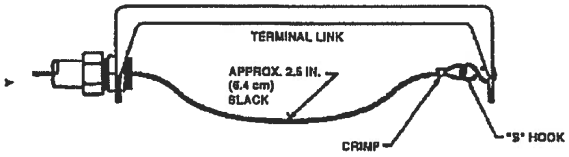


Figure 4-9. Terminal Bracket Connection.
002677PC

Begin installing the Fusible Link Hangers at the terminal bracket and work toward the control head. Loop the cable through the oval opening in the hanger and hook the fusible link on the loop. See Figure 4-10.

Note: Only ML-style Fusible Links can be used

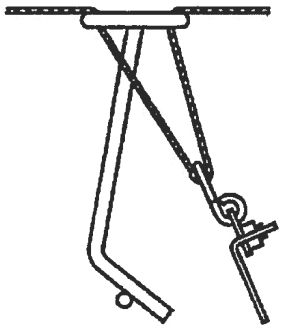

Figure 4-10. Fusible Link Connection.
002678PC

Hook the bottom of the link onto the bottom leg of the hanger. See Figure 4-11.

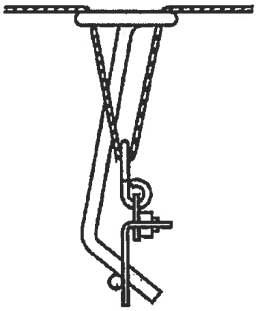

Figure 4-11. Fusible Link/Hanger Connection.
002679PC

Center the hanger/link in the fusible link bracket by sliding it along the link line. This is easily accomplished before any tension is applied to the link line. Repeat this procedure for all fusible links.

After the last hanger/link in the series is connected, the cable should be fed through the hole in the fusible link ratchet wheel. The line must then be crimped, and the crimp positioned inside the center of the ratchet wheel.

**NOTE**

Crimps must always be used in conjunction with two (2) cable lengths. Loops are the accepted method of connecting the cable to mechanical components. The crimp must never be used on a single cable. Exception: Single cable crimp allowed in detection and gas valve ratchet wheel using stop sleeve, Part No. 26317 (packages of 10: Part No. 24919).

The fusible link line can now be put into a set position by applying tension to the fusible link line. This is accomplished by using a 1/2 in. hex wrench on the fusible link line ratchet wheel. The ratchet wheel will be ratcheted in a clockwise direction until the spring plate makes contact with the top of the control head box. The fusible link line is now in a set position. See Figure 4-8. Check to ensure that the fusible link hanger(s) remain centered in the bracket after the fusible link line is set. See Figure 4-12.

## THERMAL DETECTOR INSTALLATION

Thermal detectors are always used in conjunction with the Model ECH3 Electrical Control Head. After mounting the cylinder and control head, the thermal detector(s) can be installed. See Chapter III for detector placement guidelines. Follow the instructions included with the detector for proper detector mounting procedures.

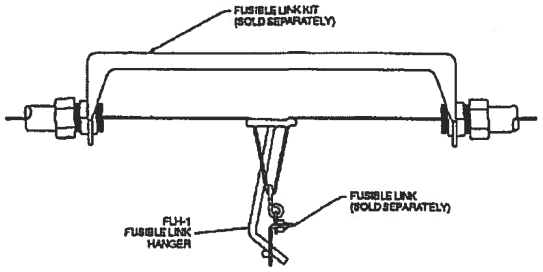


Figure 4-12. Fusible Link/Hanger in Set Position
002850PC

## SETTING THE CONTROL HEAD

### 1. Model MCH3/NMCH3 Mechanical Control Head.

Once the fusible link line is set, the control head can be placed in the set position. To set the control head, the slide plate is moved from right to left, ensuring the bolt extending from the cam arm is in the slot provided in the slide plate. Continue moving the slide plate to the left until the latching arm is in the locked position. Insert the pull pin into the hole in the slide plate above the latching arm. This will lock the control head in the set position, eliminating accidental actuation during the rest of the installation procedure. See Figure 4-13.

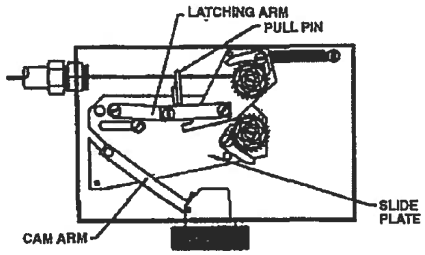


Figure 4-13. Control Head in Set Position.
002880PC

### 2. Model ECH3 Electrical Control Head.

Once the thermal detectors have been installed, the control head can be placed in the set position. To set the control head, the slide plate is moved from right to left, ensuring the bolt extending from the cam arm is in the slot provided in the slide plate. Continue moving the slide plate to the left until the latching arm is in the locked position. Insert the pull pin into the hole in the slide plate above the latching arm. This will lock the control head in the set position, eliminating accidental actuation during the rest of the installation procedure.

Once the Model ECH Electrical Control Head is in the set position, it can be connected to the detection/actuation circuit.

**NOTE**

No electrical connections shall be made inside the control head. All electrical wiring shall exit the control head through the knock-out on the side of the box. All electrical connections must be made in an approved electrical box.

Connect one of the black wires on the solenoid in the control head to the red wire of the Model MS-SPDT Micro Switch. The brown wire from the micro switch is then connected to one side of the first thermal detector in series. Connect the other side of the first thermal detector in series and the remaining black wire on the solenoid in the control head to the appropriate power source after installing the Model SM-24/120 Solenoid Monitor.

**CAUTION**

The solenoid must never be wired "hot" (not through the micro-switch). If wired this way, the non-field replaceable solenoid will be damaged and the complete control head will require replacement.

**NOTE**

A Model SM-24/120 Solenoid Monitor must always be used with an Electrical Control Head to supervise the actuation/detection circuit.

The Model ECH3-24 Electrical Control Head requires a UL Listed 24VDC power supply with a minimum 2A rating. The Model ECH3-120 Electrical Control Head requires a 1A, 120VAC power supply.

## SOLENOID MONITOR INSTALLATION

### 1. Solenoid Monitor Installation In Detection Circuit.

After installing the thermal detectors and the control head, the Model SM-120/24 Solenoid Monitor can be installed. The Solenoid Monitor is connected to the wires leading from the last thermal detector. It should be mounted in a location where it can be readily observed.

The Solenoid Monitor is an end-of-line device that supervises the actuation/detection circuit. It is comprised of a push-type switch with a built-in indicator light, a plug-type relay, a relay socket, and a cover plate. The light, when illuminated, indicates that the detection/actuation circuit is in the normal condition. The Solenoid Monitor also provides two sets of dry contacts. The Solenoid Monitor's cover plate is used to mount the Solenoid Monitor in a standard 6 in. x 4 in. x 3 in. deep electrical box (See Figure 4-14).

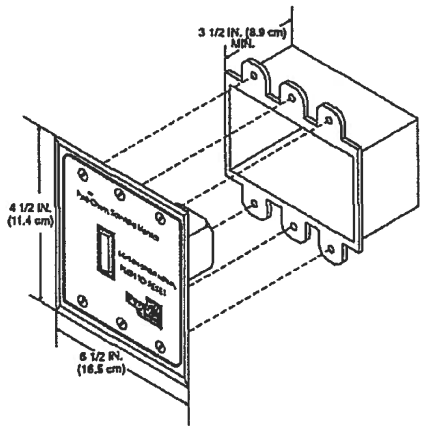


Figure 4-14. Solenoid Monitor Installation.
002681PC

All wire for circuits using the Model SM-24 shall be 18 gauge minimum, or as required by local code. All wire for circuits using the Model SM-120 shall be 14 gauge minimum, or as required by local code. The basic wiring diagram for both the Model SM-24 and Model SM-120 is shown in **Figure 4-14.1.**

After the Solenoid Monitor has been installed, the detection/actuation circuit can be connected to the appropriate power source and energized. To energize the detector/actuation circuit, depress the switch on the Solenoid Monitor. The light will illuminate to indicate that the circuit is properly installed. If the light fails to illuminate, the wiring must be checked.

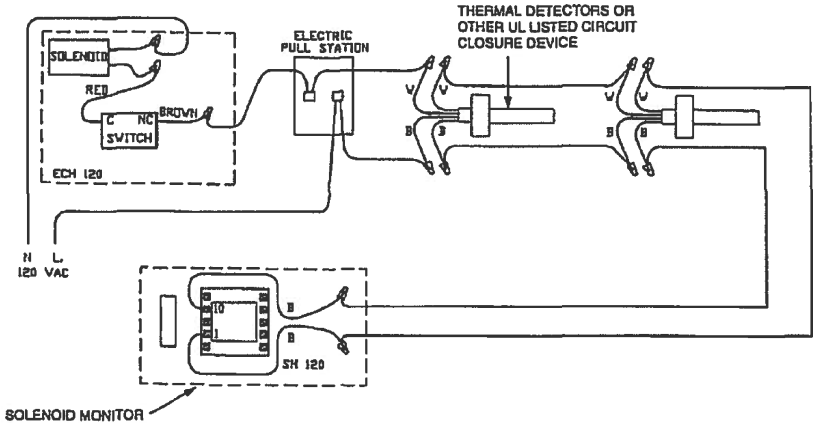


Figure 4-14.1. Wiring Diagram, Solenoid.
002682PC

### 2. Solenoid Monitor When Used As A Reset Relay

The Model SM-24/120 can be used as a reset relay when required. A reset relay is required whenever an electrical gas shut-off valve is used in conjunction with the Pyro-Chem Booth Industrial Fire Suppression System. For typical wiring connections, see **Figure 4-15.**

## REMOTE PULL STATION INSTALLATION

### 1. Model RPS-M.

The Model RPS-M Remote Mechanical Pull Station is used for remote mechanical actuation of the Model MCH3/ECH3/NMCH3 Control Head. It is to be located near an exit in the path of egress from the hazard area no more than 4 ft. (1.2 m) above the floor.

**NOTE**

A model RPS-M remote mechanical pull station must be used for manual actuation of a Model NMCH3 releasing device.

The Pull Station can be surface mounted or recessed. It is connected to the control head using 1/16 in. diameter stainless steel cable. The cable enters the pull station box from the bottom, top, either side, or back. The cable enters the control head through the top-center knockout. The cable must be enclosed in 1/2 in. conduit with a PYRO-CHEM corner pulley at each change in conduit direction. Maximum limitations for the Model RPS-M Remote Mechanical Pull Station are as follows:

| Model RPS-M Cable Run Limitations When Used With Model MCH3, ECH3, and NMCH3 Control Heads and Part No. 415670 and 423250 Pulley Elbows | |
|---|---|
| Maximum length of cable: | 150 ft. (45.7 m) |
| Maximum # of pulleys: | 40 |

After mounting the pull station box and conduit, feed the stainless steel cable from the control head, through the conduit, and into the pull station box. Insert the bushing into the pull station's cover plate and secure it with the locknut provided. Feed the cable through the bushing and into the pull handle ensuring that the cable fully crosses the set screw hole. Fasten the cable to the pull handle with the set screw (see **Figure 4-16**).

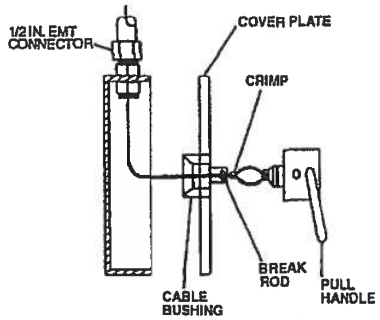


**Figure 4-16. Model RPS-M Remote Pull Station Installation.**

002884PC

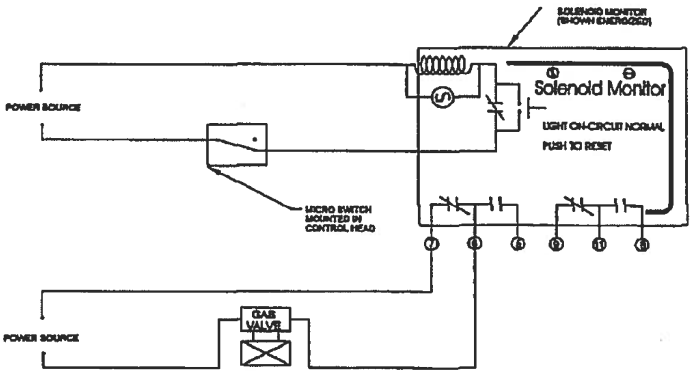


**Figure 4-15. Solenoid Monitor Wiring With Electrical Gas Shut-off Valve.**

002883PC

**NOTE**

**Crimps must always be used in conjunction with two (2) cable lengths. Loops are the accepted method of connecting the cable to mechanical components. The crimp must never be used on a single cable. Exception: Single cable crimp allowed in detection and gas valve ratchet wheel using stop sleeve, Part No. 26317 (packages of 10: Part No. 24919).**

Cut and thread the cable through the hole in the latching arm of the control head and pull the cable tight. Crimp the cable 6 in. (15.2 cm) below the latching arm.

Pull the pull handle until the crimp touches the latching arm. Coil the excess cable in the pull box and attach the cover plate with the four screws provided. Insert the pull handle into the cover plate and insert the pull pin through the bushing and the pull handle. Secure the pull pin with the nylon tie provided. **See Figure 4-17.**

## 2. Model RPS-E2.

The Model RPS-E2 remote electrical pull station is used for remote actuation of the Model ECH3 Control Head. It is to be located near an exit in the path of egress from the hazard area no more than 4 ft. (1.2 m) above the floor. The Model RPS-E2 is installed in the detection/actuation circuit and wired in accordance with the instructions included. See Figure 4-14.1 for typical circuit wiring.

# GAS SHUT-OFF VALVE INSTALLATION

## 1. Mechanical Gas Shut-Off Valve Installation.

The Model MCH3/NMCH3 Control Head is used to operate the mechanical gas shut-off valve. This valve is located in the fuel gas supply line. The valve body has an arrow which indicates direction of gas flow through the valve. The gas shut-off valve is spring loaded and requires five pounds of force to hold it open. This force is supplied by a 1/16 in. diameter stainless steel cable that is connected to the control head. After the valve is installed in the gas line, 1/2 in. conduit must be run from the top center knockout of the gas valve box to the lower right-hand knockout in the control head. A PYRO-CHEM corner pulley is used wherever a change in conduit direction is required.

| **Gas Valve Cable Run Limitations When Used With Model NMCH3 or MCH3 Control Heads and Part No. 415670 and 423250 Pulley Elbows** | |
|---|---|
| Maximum length of cable: | 100 ft. (30.5 m) |
| Maximum # of pulleys: | 30 |

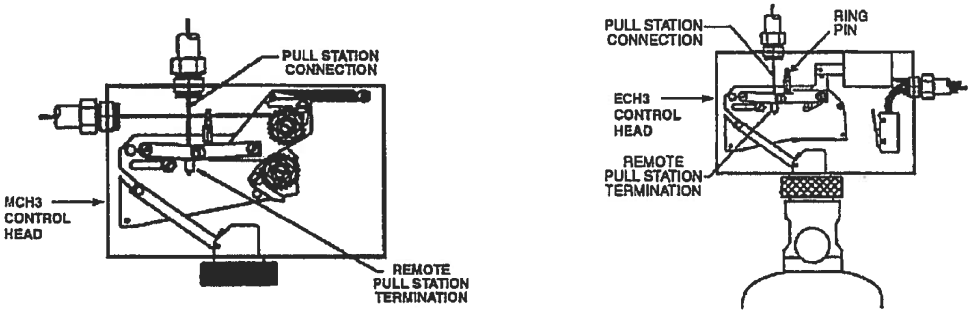


**Figure 4-17. Model RPS-M Remote Pull Station Termination.**

002885PC/003847PC

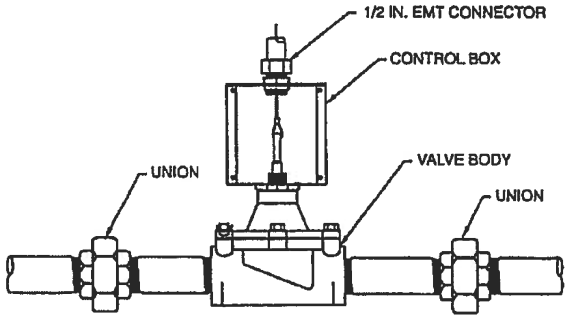


**Figure 4-18. Gas Valve Installation.**

002884PC

Remove the gas valve cover and thread the stainless steel cable through the conduit back to the control head. Thread the cable through the hole in the gas valve ratchet wheel. The line must then be crimped, and the crimp positioned inside the center of the ratchet wheel.

At the gas valve, loop the cable through the valve stem and secure it with the crimp provided (see Figure 4-18).

▸ Note: See Chapter 2 – Components for maximum dimen-
▸ sion to extend valve stem.

The gas valve line can now be put into a set position by applying tension to the gas valve line. This is accomplished by using a 1/2 in. hex wrench on the gas valve ratchet wheel. The ratchet wheel will be ratcheted in a clockwise direction until the gas valve is fully open. Secure the gas valve cover plate to the gas valve box with the four (4) screws provided. The gas valve line is now in a set position. See Figure 4-19.

**CAUTION**

Overtightening the gas valve may cause the system not to actuate.

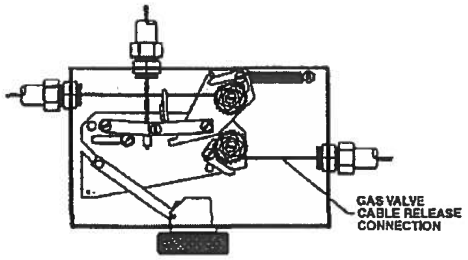


Figure 4-19. Gas Valve Line Termination.
002887PC

## 2. Electrical Gas Shut-Off Valve Installation.

The Model MCH3/ECH3/NMCH3 Control Head is used to operate the electrical gas shut-off valve. This valve is located in the fuel gas supply line. The valve body has an arrow which indicates direction of gas flow through the valve. A reset relay must always be used with an electrical gas shut-off valve. For proper wiring of the electrical gas shut-off valve, see Figure 4-15.

# TEE PULLEY INSTALLATION

The Model TP-1 Tee Pulley is used to connect two (2) mechanical gas valves or two (2) remote mechanical pull stations to a single control head. The cable proceeding from the control head must always enter the branch of the tee pulley. See Figure 4-20.

A tee pulley that is used to close two (2) gas valves can only be used to close gas valves with similar stem travel. Gas valves from 3/4 in. up to 1 1/2 in. can be used on the same tee pulley. A 2 in. gas valve can be used only with another 2 in. gas valve. Gas valves from 2 1/2 in. up to 3 in. can be used on the same tee pulley. As an example, using a 3/4 in. gas valve with a 3 in. gas valve will not allow the 3 in. valve to fully open.

**CAUTION**

The tee pulley must never be used to connect multiple fusible link lines to a single control head.

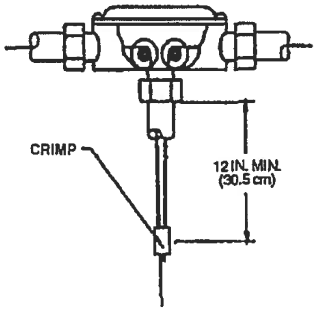


Figure 4-20. Tee Pulley Installation.
002888PC

# MICRO SWITCH INSTALLATION

See NFPA 72, "National Fire Alarm Code," Initiating Devices section, for the correct method of wiring connection to the fire alarm panel.

The Model MS-SPDT, MS-DPDT, MS-3PDT, or MS-4PDT Micro Switch is available for use where an electrical output is required. These switches can be field installed in the control head. See Figure 4-21 and Figure 4-22 and refer to Instruction Sheet, Part No. 551159, included with switch shipping assembly, for detailed mounting instructions.

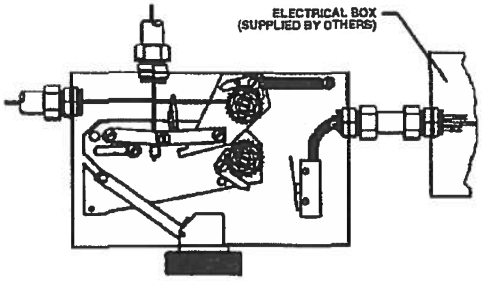


Figure 4-21. Micro Switch Installation in Model MCH3/NMCH3 Control Head.
002889PC

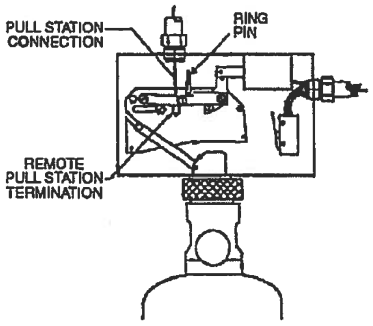


**Figure 4-22. Micro Switch Installation In Model ECH3 Control Head.**
003647PC

**NOTE**

The Model ECH3 Control Head is supplied with a Model MS-DPDT Micro Switch. This switch can be used in the actuation/detection circuit and for electrical output.

These switches may be used to provide an electrical signal to the main breaker and/or operate electrical accessories provided the rating of the switch is not exceeded. Wiring connections are shown in Figure 4-23. The contact ratings for the switches are as follows:

**Contact Ratings For Micro Switches**
**21 amps, 1 HP, 125, 250, 277 VAC**
**or 2 HP, 250, 277 VAC**

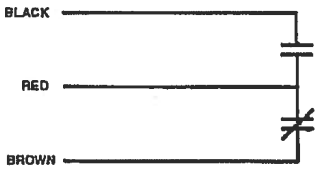


**Figure 4-23. Wiring Diagram For Model MS-SPDT Micro Switch.**
002803PC

The Alarm Initiating Switch, Part No. 550077, must be used to close a supervised alarm circuit to the building main fire alarm panel when the control head actuates. This will signal the fire alarm panel that there was a system actuation in the hazard area. This switch can be field installed in the control head. Refer to Instruction Sheet, Part No. 550081, included with the switch shipping assembly, for detailed mounting instructions. Wiring connections are shown in Figure 4-24. The switch is rated at 50mA, 28VDC.

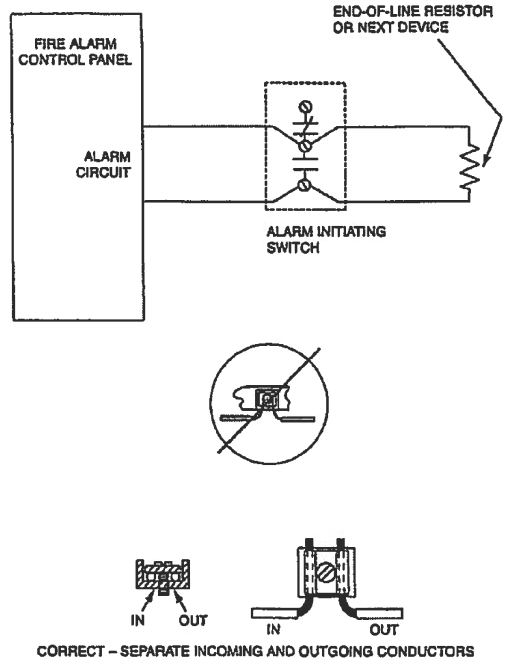


**Figure 4-24. Wiring Diagram for Alarm Initiating Switch.**
004891/004903

## PIPE AND NOZZLE INSTALLATION

**General Piping Requirements**

1. Use Schedule 40 black iron (if used in a relatively non-corrosive atmosphere), galvanized, chrome-plated, or stainless steel pipe conforming to ASTM A120, A53, or A106. Fittings must be a minimum of 150 lb. Class. However, the PCI 35, 50, and 70 lb. cylinders must have a minimum of two (2) nozzles per cylinder to utilize the 150 lb. Class fittings. If the PCI 35, 50, or 70 lb. cylinder has one (1) nozzle, then a 300 lb. Class fitting must be used. The remaining Monarch cylinders have no limitations for the 150 lb. Class fittings. Distribution pipe sizes are 3/4 in. or 1 in. depending on number of nozzles.
2. Pipe unions are acceptable.
3. Use reducing tees for all pipe splits.
4. Reducing bushings are not acceptable.
5. Cast iron pipe and fittings are not acceptable.
6. **Pipe thread sealant or pipe joint compound is not allowed for distribution piping.**
7. Bell Reducer or any non-restrictive fittings are allowed.
8. Before assembling the pipe and fittings, make certain all ends are carefully reamed and blown clear of chips and scale. Inside of pipe and fittings must be free of oil and dirt.

9. If Teflon tape is used on threaded ends, start at the second male thread and wrap the tape clockwise around the threads, away from the pipe opening.
10. All system piping must comply with Section A-5-9.1 of NFPA-17.

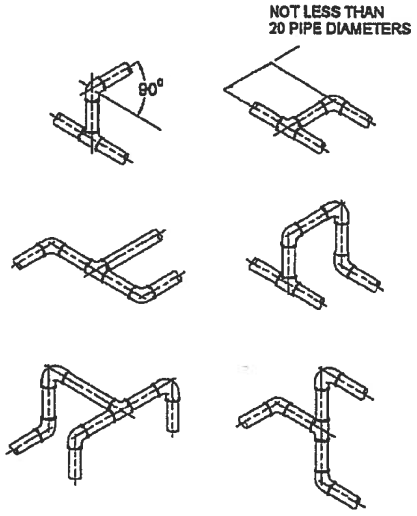


Figure 4-25. Acceptable Piping Methods.
002965PC

**CAUTION**

Do not apply Teflon tape to cover or overlap the pipe opening, as the pipe and nozzles could become blocked and prevent the proper flow of agent.

## TEE POSITIONING

In order to obtain equal distribution at a tee, the dry chemical must enter the side port of the tee and exit through the two end ports. See Figure 4-26.

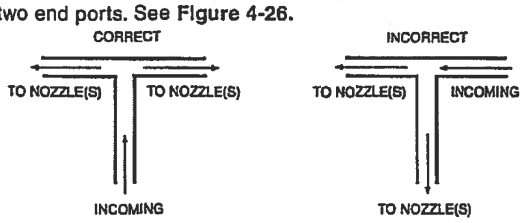


Figure 4-26. Tee Positioning
003126

### Hanger/Support Installation

The hanger/supports must be installed in conjunction with the pipe and fittings. The spacing requirements for hangers/supports depend on the pipe size being utilized; refer to the Spacing Guidelines Chart.

PIPE HANGER SPACING GUIDELINES CHART

| Distribution Pipe Size | Maximum Spacing Distance Hanger to Hanger | |
|---|---|---|
| in. | ft. | m |
| 1/4 | 4 | (1.2) |
| 1/2 | 6 | (1.8) |
| 3/4 | 8 | (2.4) |
| 1 | 12 | (3.6) |

Other factors that influence hanger/support spacing are:

- Hanger/Support must be placed within 1 ft. (0.3 m) of the discharge nozzle.

Hanger/Support must be placed between elbows when distance is greater than 2 ft. (0.6 m).

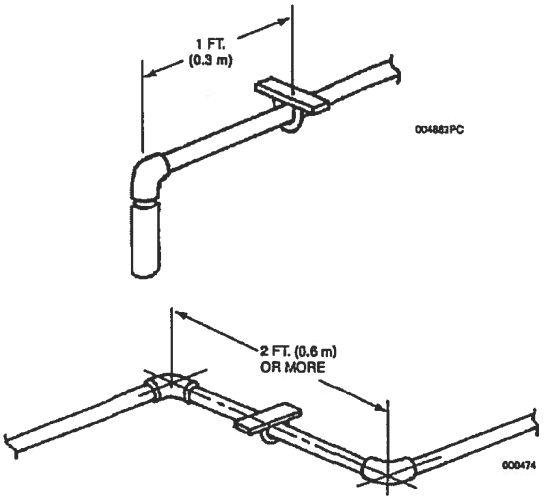


Figure 4-27. Hanger/Support.

## MAIN/RESERVE SYSTEM

When a reserve system is being utilized, two 1 in. swing check valves, Part No. 417788, must be installed in the distribution piping network. They should be positioned as close as possible to the "Y" fitting joining the piping from the main and reserve tanks to one common supply pipe. See **Figure 4-28. Note:** Make certain to install swing check valves in the direction of dry chemical flow as shown with an arrow stamped on the valve body.

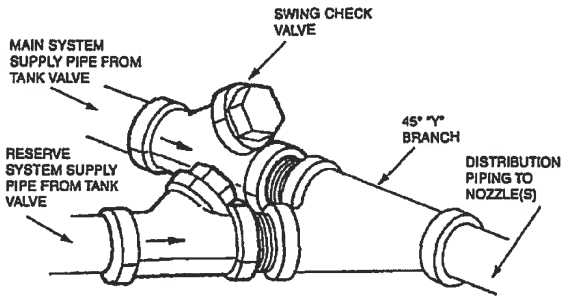


**Figure 4-28. Main/Reserve System.**

## PRESSURE SWITCH INSTALLATION

The Model PS-SPDT-X Pressure Switch is available for use when an electrical output is required. It must be installed in the discharge piping within 12 in. (30.5 cm) of the valve discharge port as shown in **Figure 4-29.** An inline tee is used for the installation. The switch is isolated from the chemical by a 12 in. to 15 in. (30.5 to 38.1 cm) column of air in the form of a vertical pipe nipple. The switch is then mounted at the top of this nipple.

> **NOTE**
>
> Piping for pressure switch must be included in total cylinder to T1 piping limitations. The fitting used to connect the pressure switch to the distribution piping counts as one (1) elbow in that section.

As an alternate, the switch may be connected directly to the copper tubing of a remotely mounted control head or a PAC cylinder. The PS-SPDT-X counts as one cylinder in this section, and the limitations on copper tubing and/or pipe previously stated in this manual apply.

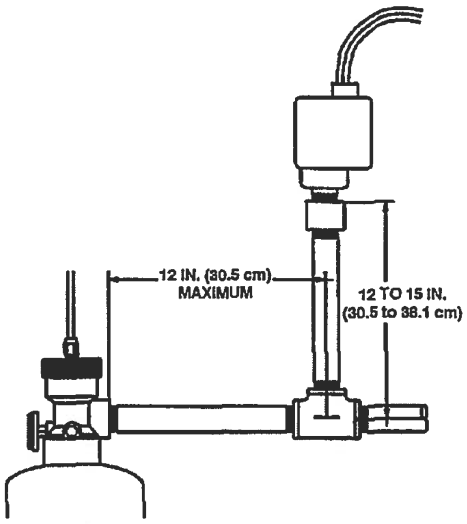


**Figure 4-29. Pressure Switch Installation.**

## SYSTEM CHECKOUT AFTER INSTALLATION

### 1. Model MCH3 Mechanical Control Head.

Before putting the system into service, all components must be checked for proper operation. During this checkout, assure that the carbon dioxide pilot cartridge is not installed in the control head actuator. Remove the pull pin from the hole in the slide plate.

To check satisfactory operation of the control head, cut the terminal link or the "S" hook holding the link. This will relieve all tension on the fusible link line and operate the control head. The slide plate will move fully to the right. The gas valve cable will be released, causing the gas valve to close. Any auxiliary equipment connected to the dry contacts of the solenoid monitor and/or the Micro Switch in the control head will operate.

If any of these events fail to occur, the problem must be investigated and repaired.

Repair the terminal link and put the fusible link line back into the set position. This is accomplished by using a 1/2 in. hex wrench on the fusible link line ratchet wheel. The ratchet wheel will be ratcheted in a clockwise direction until the spring plate makes contact with the top of the control head box.

VIKING FIRE PROTECTION INC. 3005 | Pitfield boulevard | Saint-Laurent, Québec, Canada | H4S 1H4
Tel.: 514.332.5110 Fax: 514.332.6260 info@vikingfire.ca

# CHAPTER 5

# MAINTENANCE

# CHAPTER V
# SYSTEM MAINTENANCE

## GENERAL

This chapter will detail the basic information necessary for proper maintenance of the PYRO-CHEM Industrial Fire Suppression System. However, before attempting any system maintenance, it is necessary to attend a Factory Certification Training Class and become Certified to Install and maintain the PYRO-CHEM Industrial Fire Suppression System.

## MAINTENANCE AFTER SYSTEM DISCHARGE

### 1. System Cleanup.

The hazard area cleanup after a system discharge is very basic. The dry chemical agent should be cleaned up by either sweeping or vacuuming. Residual dry chemical should be wiped off effected surfaces with a damp cloth.

### 2. System Cylinder Recharge.

**CAUTION**

Protective eye goggles and protective footwear must be worn when performing system maintenance.

1. Remove the cylinder from the control head or pneumatic adaptors and inspect for visual damage. If there is any damage the cylinder must be hydrostatically tested before being refilled. If there is no damage, the cylinder can be recharged.
2. Reset all pneumatic actuators (Models PDA-D2) by depressing the check valve on top and relieving the pressure. Remove the pneumatic actuator or control head from the valve and use any 1/4-20 UN screw or bolt to screw into the top of the piston. Pull up on the piston until the piston is flush with the top of the valve body and remove the screw or bolt from the piston.
3. Remove the valve and siphon tube assembly from the cylinder and unscrew the siphon tube from the valve.
4. Inspect the valve to make sure no mechanical damage has occurred. If there is evidence of any damage to the seals, rebuild the valve using the Dry Valve Rebuilding Kit (PYRO-CHEM Part Number 550037).
5. Screw the siphon tube back into the valve.
6. Refill the cylinder with agent. Use the table below for easy reference.

| Cylinder | Recharge |
|---|---|
| PCI-15ABC | 12.5 lb. ABC (Part No. 550170) |
| PCI-17ABC | 17 lb. ABC (Part No.550170) |
| PCI-25sBC | 25 lb. BC (Part No.550162) |
| PCI-25sABC | 25 lb. ABC (Part No.550170) |
| PCI-35ABC | 35 lb. ABC (Part No.550170) |
| PCI-50sBC | 50 lb. BC (Part No.550162) |
| PCI-50sABC | 50 lb. ABC (Part No.550170) |
| PCI-70ABC | 70 lb. ABC (Part No.550170) |

The Model RC-50ABC (Part No. 550170) is a 50 lb. pail of ABC dry chemical recharge agent available from PYRO-CHEM. The Model RC-50BC (Part No. 550162) is a 50 lb. pail of BC dry chemical recharge agent available from PYRO-CHEM.

7. Insert the siphon tube into the cylinder, and screw the valve onto the cylinder. Make sure that the valve is screwed completely into the cylinder.
8. Attach the Recharge Adaptor (PYRO-CHEM Part No. 550130) to the discharge port of the valve. The adaptor O-ring should be completely inside the discharge port. Attach a source of dry nitrogen to the adaptor.

   Charge the cylinder with dry nitrogen to 350 psi at 70°F.

**NOTE**

1. The pressure gauge attached to the cylinder valve should not be used to determine when the charging pressure has been reached. A pressure regulator should be used.
2. Higher pressure may be needed during the initial charging stage to blow the agent out of the siphon tube. Secure the cylinder during this stage, as it may jump as the agent is blown from the siphon tube.

9. Slowly disconnect the nitrogen source from the Recharge Adaptor. The cylinder valve will close when the Recharge Adaptor is depressurized. When the valve is closed and the nitrogen source is disconnected from the Recharge Adaptor, remove the recharge adaptor from the valve discharge port. Immediately screw the recoil preventer into the discharge port.

**CAUTION**

The recoil preventer must remain in the valve discharge port until the cylinder is attached to the piping network.

10. Reinstall the cylinder to the piping network. Reattach the control head or pneumatic adaptor.

### 3. Piping and Nozzles.

Piping should be blown out with air or dry nitrogen. Nozzle blow off caps should be replaced.

### 4. System Reset.

All fusible links should be replaced. The fusible link line can now be put into a set position by applying tension to the fusible link line. This is accomplished by using a 1/2 in. hex wrench on the fusible link line ratchet wheel. The ratchet wheel will be ratcheted in a clockwise direction until the spring plate makes contact with the top of the control head box. The fusible link line is now in a set position.

After setting the fusible link line, the system can be put back into service by following the SYSTEM CHECKOUT AFTER INSTALLATION Section of Chapter IV.

## REGULAR SYSTEM MAINTENANCE

### 1. Six (6) Month Maintenance.

1. Check that the hazard has not changed.
2. Check that all nylon ties are in place and the system has not been tampered with.
3. Check the entire system for mechanical damage.
4. Check the solenoid monitor.
5. Disconnect the control head or pneumatic tubing from each agent cylinder. Remove the carbon dioxide pilot cartridge and exercise the control head to ensure it is functioning properly. Make sure the gas shut-off valve and the remote pull station are functioning properly.

**NOTE**

Before continuing, remove the cover from the control head and insert the pull pin in the hole in the slide plate above the latching arm. This will secure the system, preventing accidental discharge.

6. Inspect fusible link detectors for excessive grease buildup. Clean or replace links if necessary. Visually inspect thermal detectors.

**NOTE**

Methods and frequency of inspection, testing and maintenance of detectors should be in accordance with NFPA-72.

7. Reinstall the carbon dioxide pilot cartridge and replace the control head cover and nylon tie.

**CAUTION**

Before screwing the carbon dioxide pilot cartridge into the actuator, ensure that the actuator has an O-ring installed.

8. Inspect the cylinder pressure. Tap the gauge lightly to ensure the needle is moving freely. If the gauge shows a loss in pressure indicated by the needle being below the green band, the tank should be removed and recharged per the SYSTEM CYLINDER RECHARGE section of Chapter V (System Maintenance) in this manual.

### 2. Annual Maintenance.

1. Inspect as per six (6) month maintenance instructions.
2. Disconnect and remove the discharge piping from the system. Using air or nitrogen, blow out the discharge piping. Replace all nozzle caps.
3. Fixed temperature sensing elements of the fusible alloy type shall be replaced at least annually or more frequently, if necessary, to assure proper operation of the system.
4. Test thermal detectors and remote pull station per SYSTEM CHECKOUT AFTER INSTALLATION section located in Chapter IV (System Installation) of this manual. Per NFPA 72, two (2) or more detectors per circuit should be tested. Note individual detector location and date of testing. Within 5 years, all detectors in system must be tested.
5. Replace the carbon dioxide pilot cartridge, recording the date of installation on the cartridge with a felt-tipped marker.

**CAUTION**

Before screwing the carbon dioxide pilot cartridge into the actuator, ensure that the actuator has an O-ring installed.

### 3. Six (6) Year Maintenance.

1. Inspect as per annual maintenance instructions.
2. Examine the dry chemical. If there is evidence of caking, the dry chemical shall be discarded.

### 4. Hydrostatic Testing.

The dry chemical agent cylinder(s) and pneumatic cylinder(s) shall be hydrostatically tested at least every twelve (12) years as per NFPA-17.

**NOTE**

Refer to NFPA-17 for additional maintenance requirements.

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## Vendor Document Status

1 ☐ Proceed to next submission and status.

2 ☐ Proceed with exceptions as noted to next submission and status.

3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.

4 ☑ Complete, no further submission required.

By: Jean-Francois Tremblay Date: 2017-05-02

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Agnico Eagle No. 6515-C-270-007-141-TES-0015 R: Sub001

**DOCUMENT FOR INFORMATION**

NUQSANA-PROMEC MINING

# Fuel Tanks Piping
## Supply and Installation

AGNICO EAGLE

# Punchlist

**Document Number : AEM-GE-ITR-003**
**Contract Number : C22466T / C22498E**

**Equipment/System description:**

| ITEM No | DESCRIPTION | CAT 1 | CAT 2 | CAT 3 | COMMENTS | COMPLETED |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
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| 20 | | | | | | |

CAT 1 = Effects commissioning
CAT 2 = Effects operation
CAT 3 = Post operation

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1 ☐ Proceed to next submission and status.

2 ☐ Proceed with exceptions as noted to next submission and status.

3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.

4 ☑ Complete, no further submission required.

By: Jean-Francois Tremblay Date: 2017-05-02

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle No. 6515-C-270-007-141-TES-0016 R: Sub001

**DOCUMENT FOR INFORMATION**

Date: _____

To: _____

Project No: _____

Contract No: _____

Contract Title: _____

Contractor: _____

We, _____ (Contractor's Name), the Contractor for the above described contract, hereby certify that we have reviewed the Contract Documents pertaining to:

Contract No.: _____

Contract Name: _____

Partial Completion Certificates: _____

and having physically inspected the Work performed, do hereby file claim for a notice of Final Completion.

I do declare that I am, _____ (Responsible's Name), HAVING AUTHORITY FROM MY COMPANY TO PETITION FOR THE ABOVE REFERRED TO FINAL COMPLETION NOTICE.

Signature: _____

Name: _____

Title: _____

65-ULT-116-MP-001

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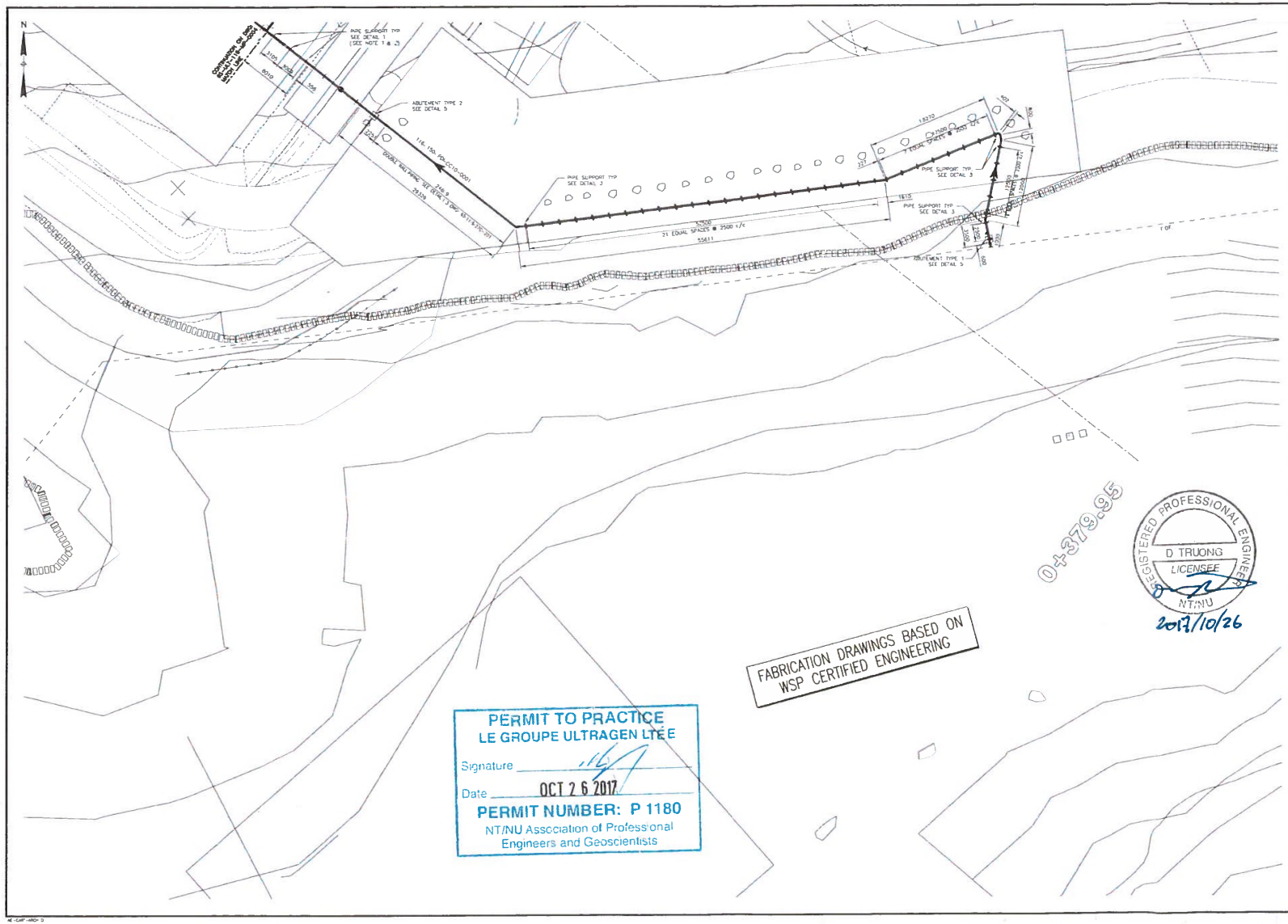



NOTES GENERALES / GENERAL NOTES

1. GUIDES SHALL BE PLACED AT LEAST 40 TO 80 PIPE DIAMETERS AWAY FROM PIPE EXPANSION LOOPS OR CHANGES IN DIRECTION.
2. IN GENERAL GUIDES USED ON LINES ON 700 AND SMALLER ARE LOCATED AT EVERY OTHER PIPE SUPPORT AND ON LINES ON 750 AND LARGER AT EVERY THIRD SUPPORT.

DESSINS EN REFERENCE / REFERENCE DRAWINGS

| TITRE / TITLE | No. DWG |
|---|---|
| GENERAL ARRANGEMENT - PLAN VIEWS | 65-ULT-116-MP-002 |
| GENERAL ARRANGEMENT - PLAN VIEWS | 65-ULT-116-MP-003 |
| FUEL DISTRIBUTION - FLOW DIAGRAM | 65-116-205-200 |
| PIPING & PIPE SUPPORT DETAILS | 65-116-270-200 |
| PIPING DETAILS | 65-116-270-201 |

AGNICO EAGLE

| NO | DATE | DESCRIPTION | DESSINÉ APP / DRAWN |
|---|---|---|---|
| 2 | 2017-10-26 | AS BUILT | A.H. |
| 1 | 2017-09-27 | PROJECT TITLE REVISED | CHK |
| 1 | 2017-09-11 | FUEL NUMBERS REVISED | TM |
| 0 | 2017-05-17 | ISSUED FOR CONSTRUCTION | A.H. |

REVISIONS

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NO. PROJET / PROJECT NO. 591700

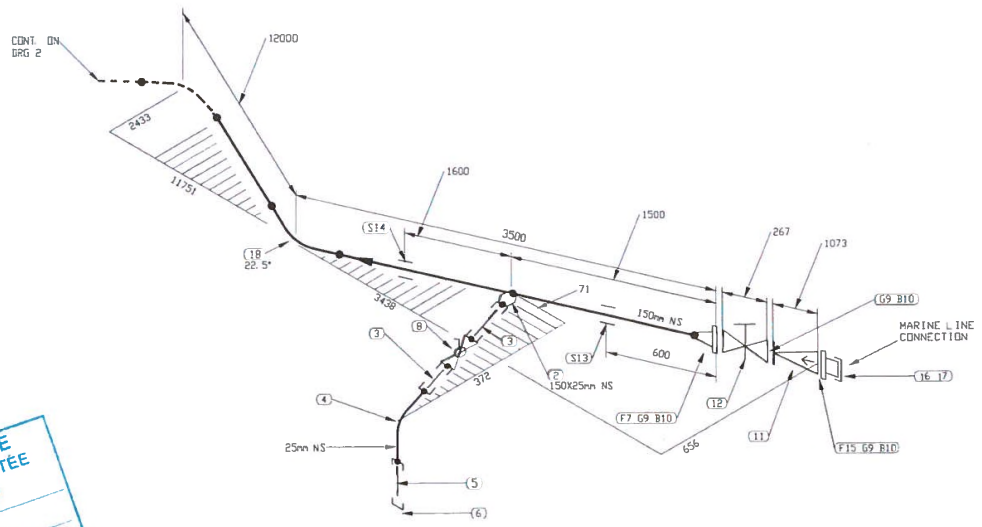
TYPE / FILE
AGNICO EAGLE – MEADOWBANK DIVISION
116 – FUEL TANK FARM
FUEL DISTRIBUTION
GENERAL ARRANGEMENT
PLAN VIEW

| | | |
|---|---|---|
| DESSINÉ PAR / DRAWN BY | A. HEBERT | DATE 2017-05-19 |
| VÉRIFIÉ PAR / CHECKED BY | - | - |
| APPROUVÉ PAR / APPROVED BY | - | - |
| ÉCHELLE / SCALE | 1 = 250 | DATE 2017-04-28 |

NO. DESSIN / DRAWING NO. 65-ULT-116-MP-001

| NO. PROJET / PROJECT NO. | REVISION | FEUILLE / SHT |
|---|---|---|
| 6515 | 3 | 1 / 1 |

FILE NO. 65-ULT-116-MP-001.dwg

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Date OCT 26 2017
PERMIT NUMBER: P 1180
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FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 16045 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 1 | 150X25 | A 350 Gr. LF2 | CL 3000, SOCKOLET |
| 3 | 2 | 25 | A 333 Gr. 6 | SCH 80, NIPPLE x 75mm LG PBE |
| 4 | 1 | 25 | A 350 Gr. LF2 | CL 3000, SW 90 DEG ELBOW |
| 5 | 1 | 25 | A 333 Gr. 6 | SCH 80, NIPPLE x 75mm LG PDExTOE |
| 6 | 1 | 25 | A 350 Gr. LF2 | CL 3000, THRD CAP |
| 7 | 1 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 8 | 1 | 25 | BA-29 | CL 600, SW, BALL VALVE |
| 9 | 3 | 150 | ASME B16.20 | CL 150, GARLOCK 5500, RING TYPE GASKET 1/8" THK |
| 10 | 24<br>1 | 19 | A 193 B7/A 194 2H | CL 150, 8 - 19.05 X 100 STUD BOLTS c/w TWO HEAVY HEX NUTS |
| 11 | 1 | 150 | Ck-29 | CL 150, RF, SWING CHECK VALVE |
| 12 | 1 | 150 | GA-10 | CL 150, RF, GATE VALVE |
| 13 | | 150 | | PIPE GUIDE AS PER DETAIL 4, DWG: 65-116-270-200 |
| 14 | 1 | 150 | | PIPE SUPPORT AS PER DETAIL 3, DWG: 65-116-270-200 |
| 15 | 1 | 150 | A 350 Gr. LF2 | CL 150, RF, BLIND FLANGE (C/W 4" NPT HOLE) |
| 16 | 1 | 100 | | CAMLOCK F400-SS |
| 17 | 1 | 100 | | CAMLOCK DC400-SS |
| 18 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW TRIM TO 22.5 |

| No. | DATE | REVISION | APP. |
|---|---|---|---|
| 4 | 2017/10/13 | AS BUILT | A.H |
| 3 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 2 | 2017/09/11 | LINE NUMBERS REVISED | QVN |
| 1 | 2017/06/30 | DRAIN REVISED AS PER CLIENT COMMENTS | QVN |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

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CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL — REGISTERED PROFESSIONAL ENGINEER — D TRUONG — LICENSEE — NT/NU — 2017/10/26

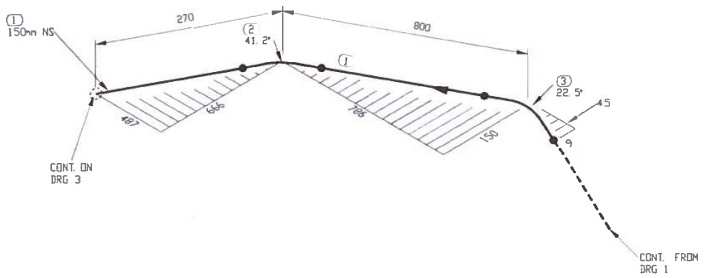
| | |
|---|---|
| CONC.: KHV | |
| DATE: 2017/04/25 | |
| DESSINÉ PAR: KVE | |
| DATE: 2017/04/25 | |
| VER. PAR: - | |
| DATE: - | |
| APP.: - | |
| DATE: - | |
| ÉCHELLE: AUCUNE | |

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | REV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 1/13 | 4 |

116-MN-01, TEMP-01




## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 32178 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW TRIM TO 41.16 |
| 3 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW TRIM TO 22.5 |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

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FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

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CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL
REGISTERED PROFESSIONAL ENGINEER
D TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINÉ PAR: KVE
DATE: 2017/04/25
VÉR. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

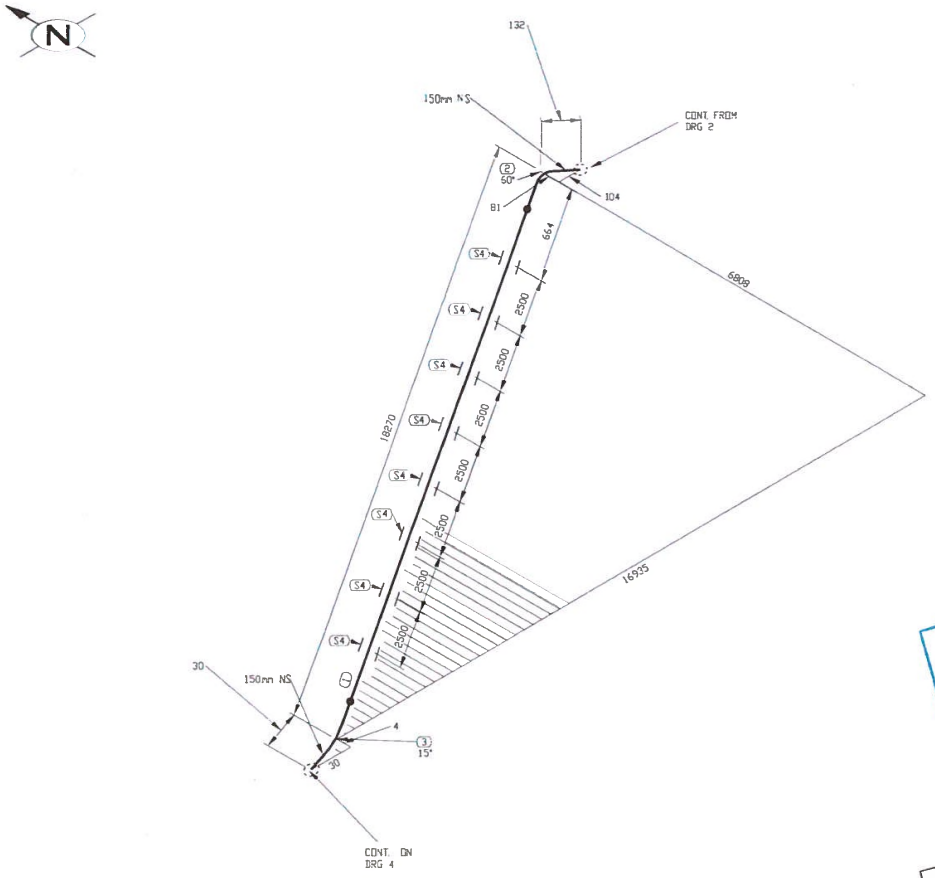
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 2/13 | 3 |

116-MN-01

FICHIER: M:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Drawing\02. Tuyauterie\02. Isométriques\01. Rankin inlet\116-150-PDI-CC10-0001-2.DWG

IMPRIMÉ LE: Oct 20, 2017 11:46am




## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 18667 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BV LR 90 DEG ELBOW TRIM TO 60.00 |
| 3 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BV LR 90 DEG ELBOW TRIM TO 15.00 |
| 4 | 8 | 150 | | PIPE SUPPORT AS PER DETAIL 3, DWG 65-116-270-200 |

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PERMIT NUMBER: P 1180
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| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT:

AGNICO EAGLE

NUQSANA PROMEC MINING

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CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

REGISTERED PROFESSIONAL ENGINEER
D. TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINÉ PAR: KVE
DATE: 2017/04/25
VER. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

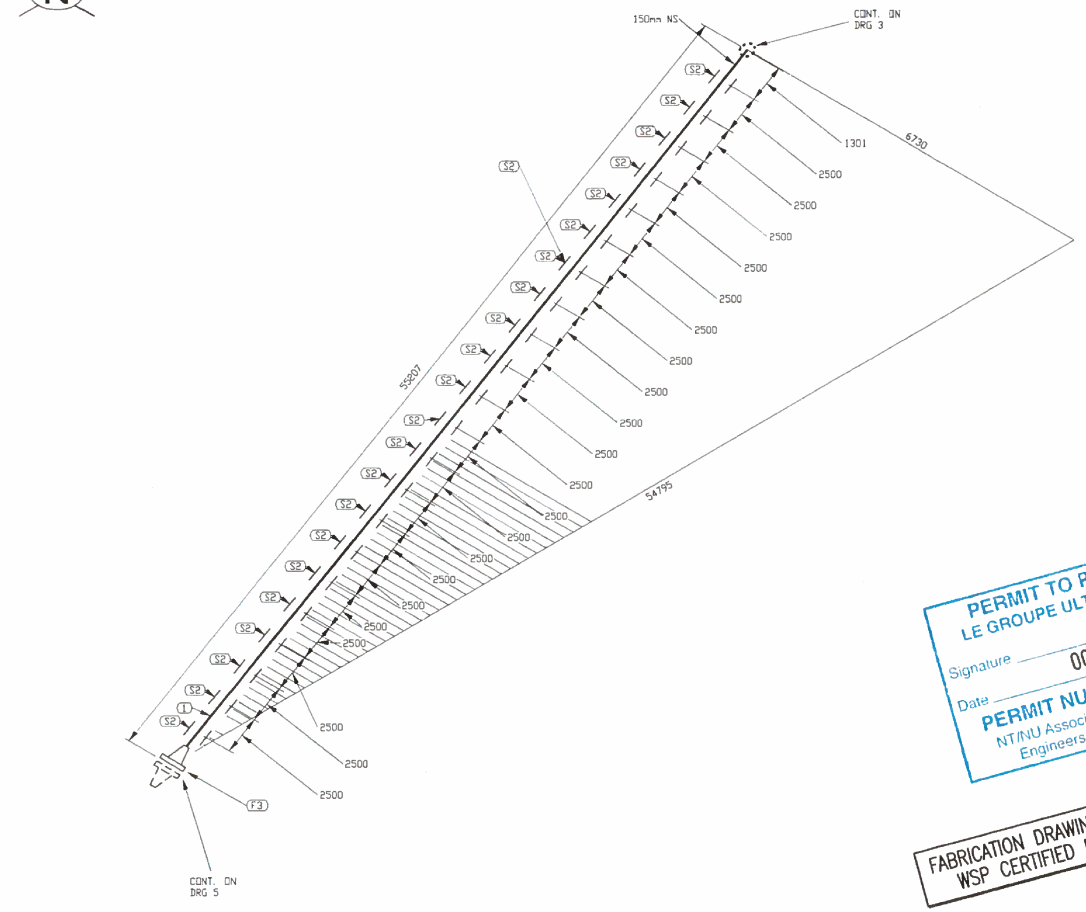
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | REV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 3/13 | 3 |

116-MN-01

FICHIER: W:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Drawing\02. Isometrics\01. Rankin Inlet\116-150-PDI-CC10-0001-3.DWG

IMPRIMÉ LE: Oct 13, 2017, 2:44pm




PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 55207 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 23 | 150 | | PIPE SUPPORT AS PER DETAIL 3, DWG 65-116-270-200 |
| 3 | 1 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |

| No. | DATE | REVISION | PAR / APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL / REGISTERED PROFESSIONAL ENGINEER
D. TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINÉ PAR: KVE
DATE: 2017/04/25
VÉR. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

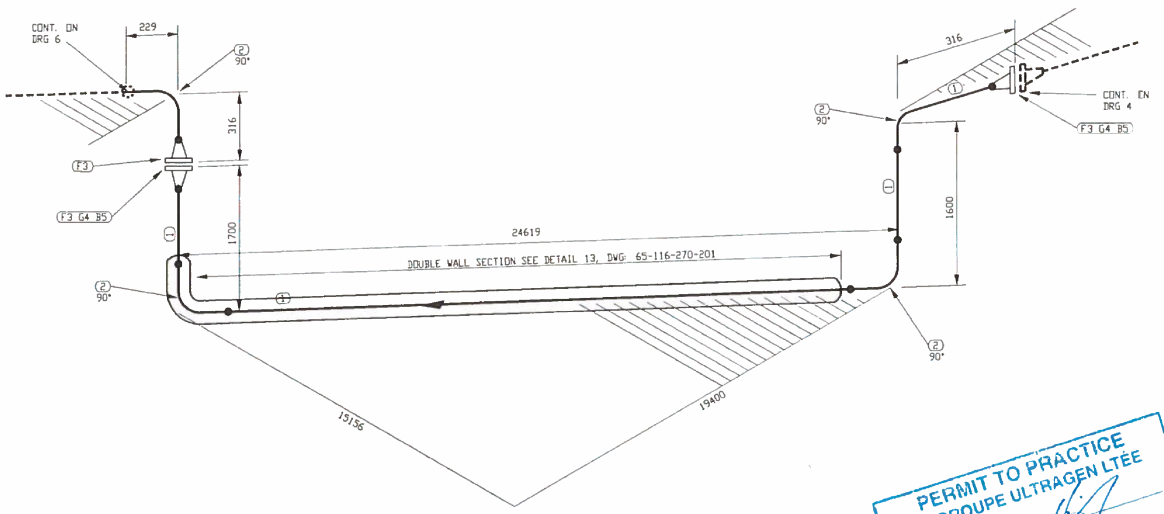
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 4/13 | 3 |

116-MN-01

FICHIER: M:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Dessins\02. Isométriques\01. Rankin Inlet_116-150-PDI-CC10-0001-4.DWG

IMPRIMÉ LE: Oct 13, 2017, 2:40pm




## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 26156 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 4 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 90 DEG ELBOW |
| 3 | 3 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 4 | 2 | 150 | ASME B16.20 | CL 150, GARLOCK 5500, RING TYPE GASKET 1/8" THK |
| 6 | 16 | 19 | A 193 B7/A 194 2H | CL 150, 8 - 19.05 X 100 STUD BOLTS c/w TWO HEAVY HEX NUTS |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
D. TRUONG
LICENSEE
NT/NU
2017/10/26

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| | |
|---|---|
| CONC.: KHV | |
| DATE: 2017/04/25 | |
| DESSINÉ PAR: KVE | |
| DATE: 2017/04/25 | |
| VÉR. PAR: - | |
| DATE: - | |
| APP.: - | |
| DATE: - | |
| ÉCHELLE: AUCUNE | |

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

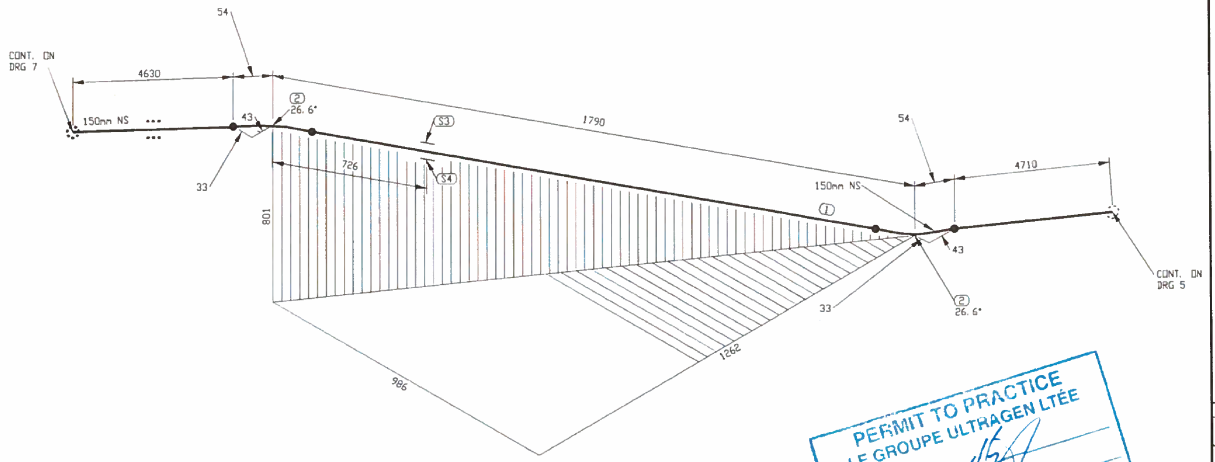
| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 5/13 | 3 |

116-MN-01

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

FICHIER: M:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Dessins\02. Tuyauterie\02 Isométriques\01. Rankin Inlet\116-150-PDI-CC10-0001-3.DWG

IMPRIMÉ LE: Oct 17, 2017, 3:35pm




## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 5344 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 2 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW TRIM TO 26.57 |
| 3 | 3 | 150 | | PIPE SUPPORT AS DETAIL 1, DWG 65-116-270-200 |
| 4 | 1 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |
| 5 | 2 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

REGISTERED PROFESSIONAL ENGINEER
NORTHWEST TERRITORIES PROFESSIONAL ENGINEERS
D TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINE PAR: KVE
DATE: 2017/04/25
VER. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

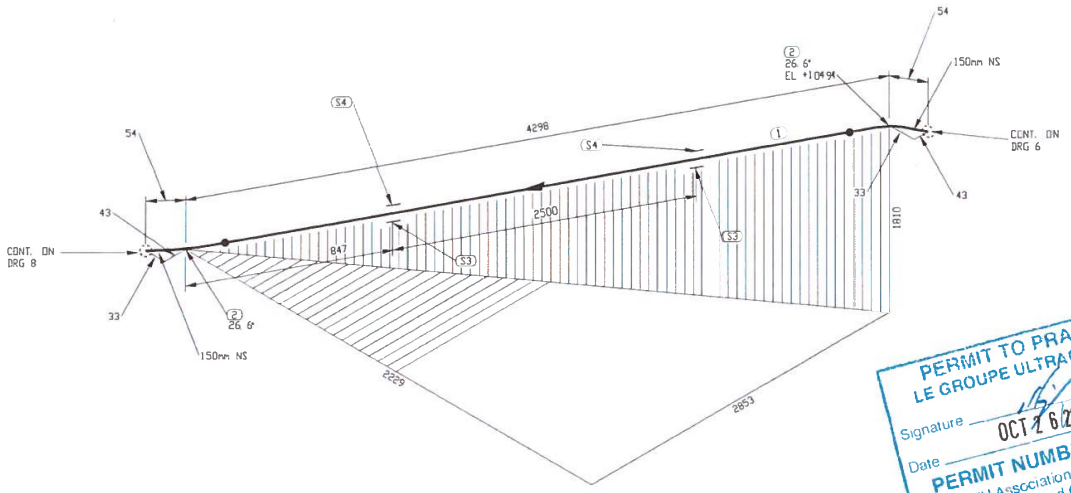
PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | REV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 6/13 | 3 |

116-MN-01

IMPRIMÉ LE: Oct 13, 2017 11:57am




PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 2 6 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 3939 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 2 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW TRIM TO 26.57 |
| 3 | 2 | 150 | | PIPE SUPPORT AS PER DETAIL 1, DWG: 65-116-270-200 |
| 4 | 2 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG: 65-116-270-200 |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | – | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL
REGISTERED PROFESSIONAL ENGINEER
D. TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV DATE: 2017/04/25
DESSINÉ PAR: KVE DATE: 2017/04/25
VER. PAR: – DATE: –
APP.: – DATE: –
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

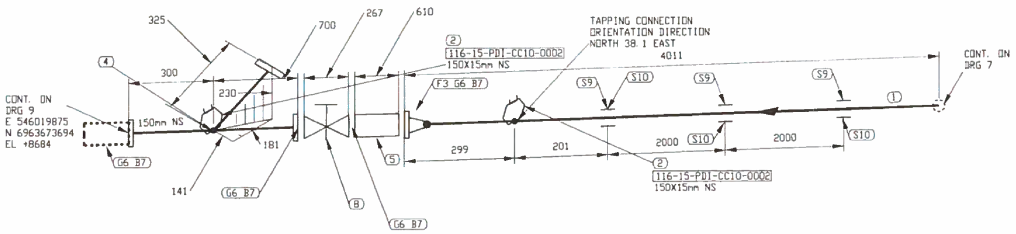
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | REV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 7/13 | 3 |

116-MN-01

FICHIER: W:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05 Dessins\02 Isométriques\01 Rankin Inlet\116-150-PDI-CC10-0001-7.DWG

IMPRIMÉ LE: Oct 13, 2017, 11:37am




## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 4914 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 2 | 150X15 | A 350 Gr. LF2 | CL 3000, THREDOLET |
| 3 | 1 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 4 | 1 | 150X150 | | CL 150, PIG CATCHER AS PER DETAIL B, DWG 65-116-270-200 |
| 5 | 1 | 150 | | CL 150, SINGLE BRAIDED HOSE ASSEMBLY |
| 6 | 4 | 150 | ASME B16.20 | CL 150, GARLOCK 5500, RING TYPE GASKET 1/8" THK |
| 7 | 32 | 19 | A 193 B7/A 194 2H | CL 150, 8 - 19.05 X 100 STUD BOLTS C/W TWO HEAVY HEX NUTS |
| 8 | 1 | 150 | GA-10 | CL 150, RF, CS, FULL PORT GATE VALVE |
| 9 | 3 | 150 | | PIPE SUPPORT AS PER DETAIL 1, DWG 65-116-270-200 |
| 10 | 3 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0001 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| | | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL
REGISTERED PROFESSIONAL ENGINEER
D. TRUONG
LICENSEE
NT/NU
2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINÉ PAR: KVE
DATE: 2017/04/25
VÉR. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

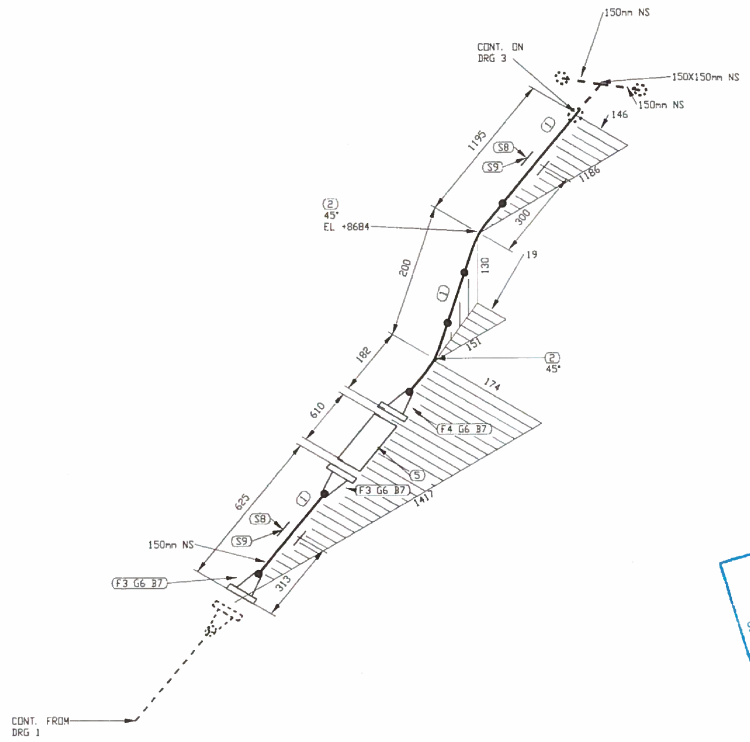
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
MARINE LINE TO 65TNK11601 & 65TNK11602

| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0001 | 8/13 | 3 |

116-MN-01

FICHIER: N:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Dessins\02. Tuyauterie\02. Isométriques\01. Rankin Inlet\116-150-PDI-CC10-0001-8.DWG

IMPRIMÉ LE: Oct 13, 2017, 11:33am




PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 1825 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 2 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW |
| 3 | 2 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 4 | 1 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 5 | 1 | 150 | | CL 150, SINGLE BRAIDED HOSE ASSEMBLY |
| 6 | 3 | 150 | ASME B16.20 | CL 150, GARLOCK 5500, RING TYPE GASKET 1/8" THK |
| 7 | 24 | 19 | A 193 B7/A 194 2H | CL 150, 8 - 19.05 X 100 STUD BOLTS c/w TWO HEAVY HEX NUTS |
| 8 | 2 | 150 | | PIPE SUPPORT AS PER DETAIL 1, DWG 65-116-270-200 |
| 9 | 2 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0006 | | CC10 | PDI | | – | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

REGISTERED PROFESSIONAL ENGINEER — D. TRUONG — LICENCEE — NT/NU — 2017/10/26

CONC.: KHV DATE: 2017/04/25
DESSINÉ PAR: KVE DATE: 2017/04/25
VÉR. PAR: – DATE: –
APP.: – DATE: –
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE – MELIADINE DIVISION
116 – FUEL TANK FARM

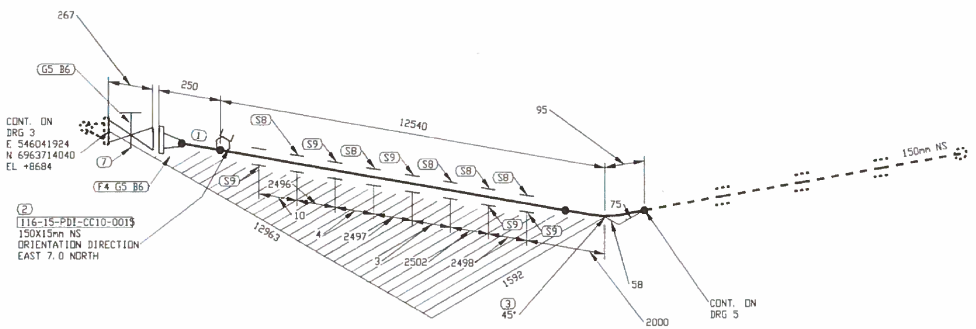
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
DIESEL FROM 65TNK11601 & 65TNK11602 TO PUMPING STATION

| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0006 | 2/12 | 3 |

116-MN-01

FICHIER: N:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Dessins\02. Tuyauterie\02. Isométriques\01. Rankin Inlet\116-150-PDI-CC10-0006-2.DWG

IMPRIMÉ LE: Oct 13, 2017, 3:33pm




PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 26 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

## LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 12983 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 1 | 150X15 | A 350 Gr. LF2 | CL 3000, THREDOLET |
| 3 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 45 DEG ELBOW |
| 4 | 1 | 150 | A 350 Gr. LF2 | CL 150, SCH STD, RF, WN FLANGE |
| 5 | 2 | 150 | ASME B16.20 | CL 150, GARLOCK 5500, RING TYPE GASKET 1/8" THK |
| 6 | 16 | 19 | A 193 B7/A 194 2H | CL 150, 8 - 19.05 X 100 STUD BOLTS c/w TWO HEAVY HEX NUTS |
| 7 | 1 | 150 | GA-10 | CL 150, RF, GATE VALVE |
| 8 | 5 | 150 | | PIPE SUPPORT AS PER DETAIL 1, DWG 65-116-270-200 |
| 9 | 5 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA FROM EC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0006 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL: REGISTERED PROFESSIONAL ENGINEER — D. TRUONG — LICENSEE — NT/NU — 2017/10/26

CONC.: KHV
DATE: 2017/04/25
DESSINÉ PAR: KVE
DATE: 2017/04/25
VER. PAR: -
DATE: -
APP.: -
DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

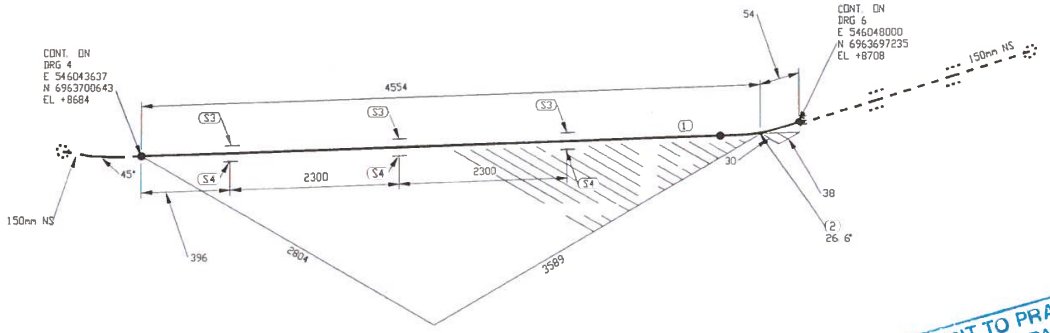
TITRE: RANKIN INLET
FABRICATION ISOMETRIC
DIESEL FROM 65TNK11601 & 65TNK11602 TO PUMPING STATION

| No PROJET | No DESSIN | PAGES | RÉV. |
|---|---|---|---|
| 6515 | 116-150-PDI-CC10-0006 | 4/12 | 3 |

116-MN-01

FICHIER: W:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05. Dessins\02. Tuyauterie\02. Isométriques\01. Rankin Inlet\116-150-PDI-CC10-0006-4.DWG

IMPRIMÉ LE: Oct 13, 2017, 3:44pm




PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature
Date OCT 17 2017
PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists

FABRICATION DRAWINGS BASED ON WSP CERTIFIED ENGINEERING

LISTE DE MATERIEL

| No | QTE | DIA | MATERIEL/CATALOGUE | DESCRIPTION |
|---|---|---|---|---|
| 1 | 5434 MM | 150 | A 333 Gr. 6 | SCH STD, SMLS PIPE |
| 2 | 1 | 150 | A 420 Gr. WPL6 | SCH STD, BW LR 90 DEG ELBOW TRIM TO 26.57 |
| 3 | 3 | 150 | | PIPE SUPPORT AS PER DETAIL 1, DWG 65-116-270-200 |
| 4 | 3 | 150 | | PIPE SHOE AS PER DETAIL 2, DWG 65-116-270-200 |

| No. | DATE | REVISION | PAR APP. |
|---|---|---|---|
| 3 | 2017/10/13 | AS BUILT | A.H. |
| 2 | 2017/09/21 | PROJECT TITLE REVISED | KHV |
| 1 | 2017/09/11 | LINE NUMBERS REVISED | KHV |
| 0 | 2017/05/15 | ISSUED FOR CONSTRUCTION | KHV |

CLIENT: AGNICO EAGLE

NUQSANA PROMEC MINING

ultragen

CONSULTANT PROJECT NO. 591700

| NO. DE CONDUITE | | SPECIFICATION | PRODUIT | SYSTEME REVETEMENT | CODE DE COULEUR | ISOLATION ET TRACAGE | EPAISS. D'ISOLATION | | |
|---|---|---|---|---|---|---|---|---|---|
| 116-150-PDI-CC10-0006 | | CC10 | PDI | | - | | | 65-116-270-200 | PIPE SUPPORT DETAILS |
| PRESSION D'OPERATION | TEMPERATURE D'OPERATION | PRESSION DE CONCEPTION | TEMPERATURE DE CONCEPTION | PRESSION D'ESSAI | CLASSE D'INSPECTION | CODE DE SERVICE | TRAITEMENT THERMIQUE | 65-116-205-200 | P&ID |
| PSIG | °F | PSIG | °F | PSIG | | | | No. DESSIN | DESSINS DE REFERENCE |

SCEAU PROFESSIONNEL — TRUONG LICENSEE NT/NU — 2017/10/26

CONC.: KHV DATE: 2017/04/25
DESSINÉ PAR: KVE DATE: 2017/04/25
VÉR. PAR: - DATE: -
APP.: - DATE: -
ÉCHELLE: AUCUNE

PROJET: AGNICO EAGLE - MELIADINE DIVISION
116 - FUEL TANK FARM

TITRE: RANKIN INLET
FABRICATION ISOMETRIC
DIESEL FROM 65TNK11601 & 65TNK11602 TO PUMPING STATION

| No PROJET | No DESSIN | PAGES | REV. |
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| 6515 | 116-150-PDI-CC10-0006 | 5/12 | 3 |

116-MN-01

FICHIER: M:\Agnico Eagle\Meliadine\591700 (Fuel Distribution)\05- Dessin\02- Tuyauterie\02- Isometriques\01- Rankin Inlet\116-150-PDI-CC10-0006-3.DWG

IMPRIMÉ LE: Oct 13, 2017, 3:54pm