

## Kraloy One-Piece Expansion Joints

A proper functioning PVC conduit system in compliance with the NEC will frequently require the use of expansion fittings to account for thermal expansion and contraction. Our Kraloy One Piece Expansion Joint (OPEJ) is designed to accommodate thermal expansion and contraction on shorter runs of PVC Conduit.

The efficient design of the One Piece Expansion Joint provides fast trouble-free installation. The National Electrical Code (NEC) requires the use of expansion joints where the expected change in length of a conduit run is 45mm or greater, due to the probable variation in temperature. See NEC Rule 352.44. The use of expansion fittings on all installations (even where it is not mandated by code) will ensure the owner receives a secure and appealing installation that will last the life of the system.



### STEP 1 – CALCULATE THE AMOUNT OF THERMAL EXPANSION/CONTRACTION

The thermal expansion/contraction is dependent upon the length of the conduit and the temperature change. The CEC provides a calculation to be used to derive the expected change in length of a run of rigid PVC Conduit in Appendix B (352.44).

Expected change in length (mm) = length of run in Meters x maximum expected temperature change x 0.0520 (coefficient of linear expansion for PVC conduit)

**EXAMPLE:** A 9 meter run is installed where the expected low temperature is -30 and high temperature is +30°C

$$\Delta \text{ change in length} = 9 \times (30 + 30) \times 0.0520$$

$$\Delta \text{ change in length} = 28.08\text{mm}$$

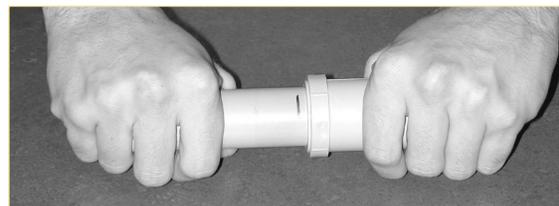
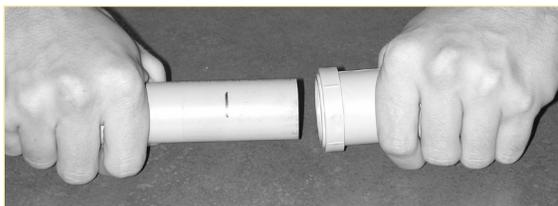
### STEP 2 – SELECT INSTALLATION METHOD

Each OPEJ fitting can accommodate 60mm of movement.

#### Quick Install Method

1. Solvent cement the PVC conduit into the conduit hub of the OPEJ and firmly secure the PVC Conduit (on the solvent cement side of the OPEJ) using Kraloy conduit straps.
2. Mark a line on the conduit to be installed into the fitting 30mm from the end. This is the insertion line. Insert the conduit into the OPEJ fitting to this line.
3. Secure and support the conduit raceway using Kraloy conduit straps and/or conduit clamps

Important: The Quick Install Method accommodates a maximum of 30mm of expansion and 30mm of contraction.



## Measured Install Method

Properly installed, the OPEJ can accommodate 60mm of expansion/contraction. Where the expected expansion/contraction is greater than 60mm it is recommended that the two-piece piston style expansion fittings (Kraloy EJ) be used.

Once the total change in length is calculated and is found to be 60mm (or less) the installer will need to know the following to properly install the OPEJ:

- Maximum temperature
- Minimum temperature
- Temperature at installation

$(\text{Max Temp} - \text{Installation Temp} / \text{Max Temp} - \text{Min Temp}) \times 60\text{mm}$  (the maximum amount of expansion/contraction of the fitting) = position of inserted conduit from the bottom of the OPEJ.

In the following examples we have assumed a Maximum Temp of 30°C and a Minimum Temp of -35°C.

**EXAMPLE 1:** Installation Temp = 25°C

$$30 - 25 / 30 - (-35) \text{ or } 5/65 \times 60 = 4.62\text{mm (5mm)}$$

Therefore the proper installation for this scenario is to install the conduit into the OPEJ fitting 5mm from the bottom. Mark the conduit to be inserted with an insertion line that is 55mm (60mm - 5mm) from the conduit end and insert to the line.

**EXAMPLE 2:** Installation Temp = 0°C

$$30 - 0 / 30 - (-35) \text{ or } 30/65 \times 60 = 27.7\text{mm (28mm)}$$

Mark the conduit with an insertion line that is 32 mm (60mm - 28mm) from the conduit end and insert to the line.

**EXAMPLE 3:** Installation Temp = -20°C

$$30 - (-20) / 30 - (-35) \text{ or } 50/65 \times 60 = 46.2\text{mm (46mm)}$$

Mark the conduit with an insertion line that is 14mm (60mm - 46mm) from the conduit end and insert to the line.

## Helpful Hints and Guidelines:

It is always good practice to use more expansion fittings than too few. The use of expansion fittings help to provide a professional installation that will perform and look good for many years.

It is important to properly support and secure the conduit system to ensure the expansion fittings perform correctly. Guidelines for installation of multiple expansion fittings can be found in the Kraloy Fittings catalog.

The Kraloy two-piece expansion joint (EJ) accommodates a larger change in length than an OPEJ and may do the job of several OPEJ fittings saving the installer time and money.

