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Installation Recommendation for Pyro E Increased Safety Seal for one, two, three, four and seven conductor cables

(TYPE OF PROTECTION "e")

This Pyrotenax cable seal is intended for use in potentially explosive atmospheres with electrical apparatus designed to meet the requirements of type of protection "e" (increased safety).

Type of protection "e" is defined as a method of protection by which additional measures are applied to the electrical apparatus to give increased security against the possibility of excessive temperatures and the occurrence of sparks during the service life of the apparatus. It applies only to electrical apparatus, no parts of which produce sparks or arcs or exceed the limiting temperature in normal service.

This seal has been developed to comply with BS EN 50014 and BS EN 50019 does not have the solvent resistance properties previously required by BS 4683 Part 4. Whilst its maximum operating temperature in accordance with BS EN 60702-2 is 105°C, in practice, the requirements of type of protection "e" lower this to 85°C.

These instructions apply to seals for one, two, three, four, five and seven conductor cables.

Seal Construction

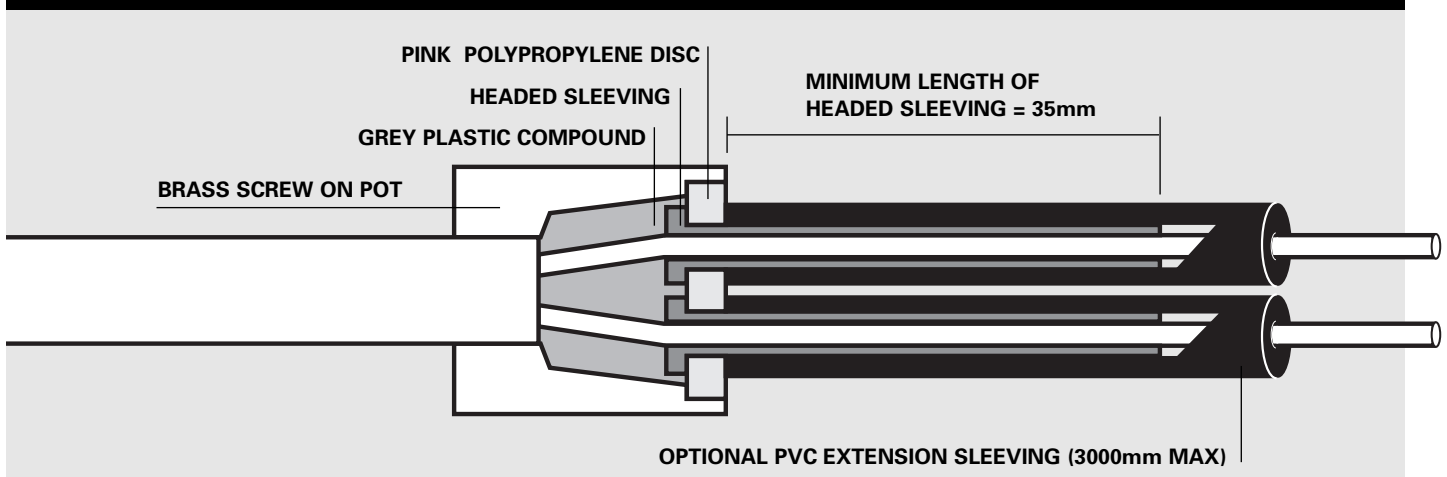


Table 1

Plain Seal Reference	Earth Tail Seal Reference	Max Operating Temperature	Compound	Pot Closure	Conductor Insulation	Extension Sleeving
RPA	RPAL	85°C	Grey Plastic	Pink Polypropylene	Headed PVC Sleeving* 150mm Long	PVC Sleeving Ref: RZE

* The following sizes of Seals incorporate headed PTFE sleeving 100mm long. RPAL4L1 20, RPAL4L1.5 20, RPAL4L2.5 20, RPAL4H1.5 20 (with Earth Tail).

Installation Instructions

Stripping the Cable Sheath and Fitting the Brass Pot

If the cable is plastic covered, first fit the gland shroud, then remove the plastic covering.

The copper sheath should be stripped back to expose the required length of conductor(s). In the case of seven conductor cable, strip an extra 10mm of sheath to allow for shortening to facilitate fitting the pot closure. Slide the gland onto the cable.

The brass pot can now be screwed on to the end of the cable, until it is positioned as shown below (Fig.1)

SHEATH APPROXIMATELY LEVEL WITH SHOULDER

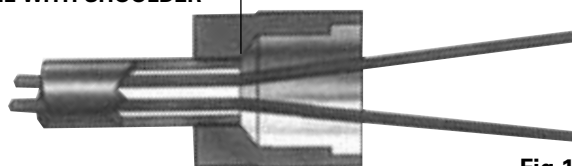


Fig.1

For more detailed instructions relating to the above procedures, please refer to our publication IR200.

Filling the Pot

After fitting the brass pot, check for squareness by sliding the gland over the pot. Remove any loose powder etc. inside the pot that may have resulted from the screwing action.

Cut the double headed pvc sleeve into two parts such that there is at least 35mm of sleeve protruding from the front of the disc. Then fit into the disc as shown (Fig. 2). If the seal incorporates PTFE headed sleeves, then these should also be inserted into the disc in a similar manner. In either case the head of the sleeves should be pulled up hard against the disc.

ENSURE HEADS OF SLEEVE ARE FLAT AGAINST THE FACE OF THE DISC

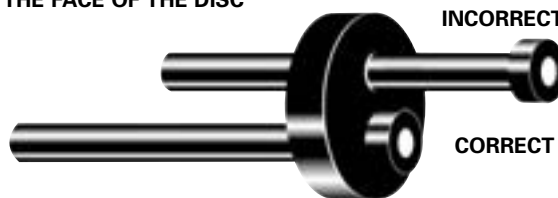


Fig.2

Slide the disc assembly over the conductors, and into the pot recess to check for fit, then partially withdraw. In the case of seven conductor cables, this operation can be facilitated by shortening the outer ring of conductors by 10mm. When terminating multi-core cables with 10 sqmm, 16 sqmm, or 25 sqmm conductors, the conductors should be "set" within the pot to facilitate location of the disc assembly within the recess.

Table 2. Increased Safety Seal References

Cable Size	Plain Seal Ref.	Earth Tail Seal Ref.
2L1	RPA2L1 20	RPAL2L1 20
2L1.5	RPA2L1.5 20	RPAL2L1.5 20
2L2.5	RPA2L2.5 20	RPAL2L2.5 20
2L4	RPA2L4 20	RPAL2L4 20
3L1	RPA3L1 20	RPAL3L1 20
3L1.5	RPA3L1.5 20	RPAL3L1.5 20
3L2.5	RPA3L2.5 20	RPAL3L2.5 20
4L1	RPA4L1 20	RPAL4L1 20
4L1.5	RPA4L1.5 20	RPAL4L1.5 20
4L2.5	RPA4L2.5 20	RPAL4L2.5 20
7L1	RPA7L1 25	RPAL7L1 25
7L1.5	RPA7L1.5 25	RPAL7L1.5 25
7L2.5	RPA7L2.5 25	RPAL7L2.5 25
1H2.5	RPA1H2.5 20	RPAL1H2.5 20
1H6	RPA1H6 20	RPAL1H6 20
1H10	RPA1H10 20	RPAL1H10 25
1H16	RPA1H16 20	RPAL1H16 25
1H25	RPA1H25 20	RPAL1H25 32
1H35	RPA1H35 20	RPAL1H35 32
1H50	RPA1H50 25	Not available
1H70	RPA1H70 25	Not available
1H95	RPA1H95 25	Not available
1H120	RPA1H120 32	Not available
1H150	RPA1H150 32	Not available
1H185	RPA1H185 32	Not available
1H240	RPA1H240 40	Not available
2H1.5	RPA2H1.5 20	RPAL2H1.5 20
2H2.5	RPA2H2.5 20	RPAL2H2.5 20
2H4	RPH2H4 20	RPAL2H4 25
2H6	RPA2H6 20	RPAL2H6 25
2H10	RPA2H10 25	RPAL2H10 32
2H16	RPA2H16 25	RPAL2H16 40
2H25	RPA2H25 32	RPAL2H25 40
3H1.5	RPA3H1.5 20	RPAL3H1.5 20
3H2.5	RPA3H2.5 20	RPAL3H2.5 25
3H4	RPA3H4 20	RPAL3H4 25
3H6	RPA3H6 25	RPAL3H6 25
3H10	RPA3H10 25	RPAL3H10 32
3H16	RPA3H16 25	RPAL3H16 40
3H25	RPA3H25 40	RPAL3H25 40
4H1.5	RPA4H1.5 20	RPAL4H1.5 20
4H2.5	RPA4H2.5 20	RPAL4H2.5 25
4H4	RPA4H4 25	RPAL4H4 25
4H6	RPA4H6 25	RPAL4H6 32
4H10	RPA4H10 25	RPAL4H10 32
4H16	RPA4H16 32	RPAL4H16 40
4H25	RPA4H25 40	RPAL4H25 40
7H1.5	RPA7H1.5 25	RPAL7H1.5 25
7H2.5	RPA7H2.5 25	RPAL7H2.5 25

Press the compound into the pot from one side only to avoid cavities, with the thumb preferably behind the paper to ensure cleanliness (Fig. 3). Fill the pot completely, overfilling slightly. Care should be taken to avoid contamination of the sealing compound.

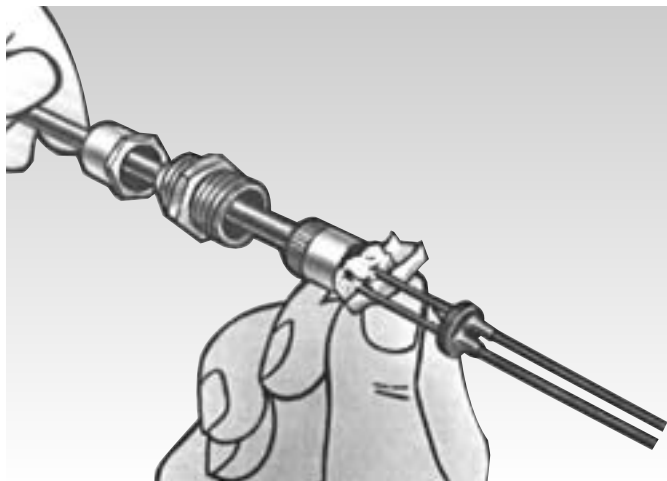


Fig.3

Crimping the Disc

Slide the disc assembly up to the pot, and press into the compound and pot recess with the aid of a pair of pliers, applying pressure only to the face of the disc. The seal is now ready for crimping. This may be carried out using one of the tools shown below.

(a) The plate type 3 point Pyro-X-Crimp Ref. ZDD (followed by pot size 20, 25, 32 or 40mm). This is an inexpensive tool, with a life of approx. 100 seals.

Operation of the tool is illustrated (fig. 4)

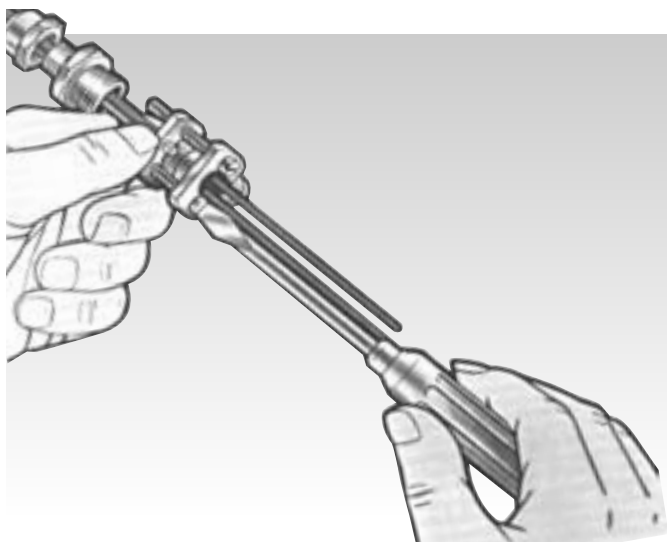


Fig.4

(b) The Pyro Crimp Ref. ZDC (followed by the pot size 20 or 25mm).

This tool has a longer life than the plate type tool. However, it is available for the 20 and 25mm pot sizes only.

Operation of the tool is illustrated (Fig. 5).

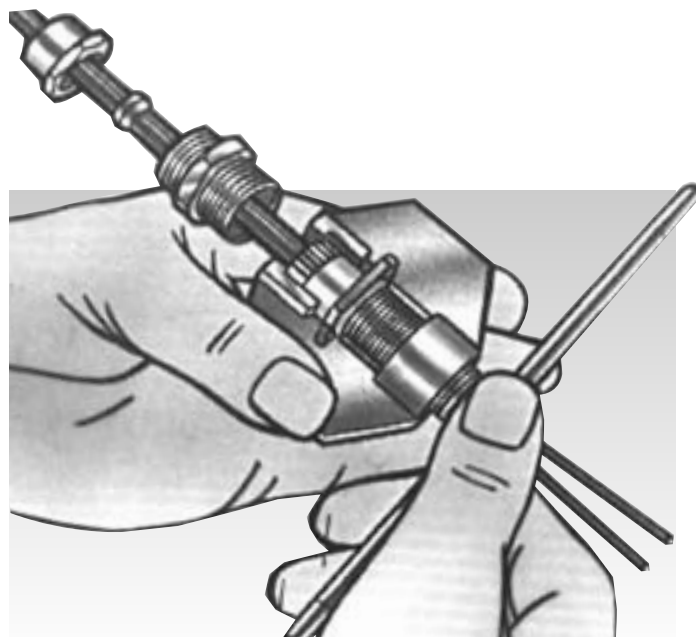


Fig.5

Remove the surplus compound that has exuded from the pot.

Extension Sleeving

The maximum length of headed conductor sleeving is shown in Table 1. If longer conductor tails are required, then extension sleeving should be fitted over the headed sleeve down to the face of the pot. This may be facilitated by shortening the headed sleeve to **not less than 35mm**.

Testing

The seal should be visually inspected for obvious defects. If there is a minor fault e.g. incomplete crimping, it may be practicable just to repeat the operation. However, it may be necessary to remove the seal and reterminate, the instructions for which are given in Installation Recommendation No. IR200. After both ends of a cable have been terminated with permanent seals, the cable should be subjected to an insulation test at a d.c. voltage appropriate to the intended operating voltage e.g. 500 volt d.c. for 250 or 500 volt operation.

Never test a cable which has unsealed ends, because this will result in false readings.

The purpose of this initial test is to check for major faults e.g. short circuits within the pot, in which case the fault should be located and rectified.

The insulation resistance should be noted and compared with the value measured at least twenty four hours later. This second reading should be at least 100 Megohms and have risen from the initial value. Initial low readings may occur when cables are terminated in high humidity conditions. In such instances, a higher second reading indicates effective sealing.

Finally identify the conductors with a bell set, ohmmeter or similar instrument and code in accordance with the current IEE Wiring Regulations for Electrical Installations BS 7671.

Degree of Ingress of Protection (IP)

In some installations, for example damp and dusty conditions or in potentially explosive atmospheres, it is necessary to specify a minimum IP Rating for enclosures and to ensure that it is maintained when cable entries into the enclosures are effected.

Recommendations as to how this may be achieved should be available from the enclosure/apparatus manufacturer or supplier (as required by Section 6 of the Health and Safety at Work Act).

Based on experience, the following information is offered for general guidance.

Plain Hole Entries

A rating of IP67 may be achieved with Pyrotenax glands using a sealing washer. However, certain characteristics of the enclosure can adversely affect the IP rating, e.g. surface finish, variations in wall thickness, dimensional tolerances and quality of entry hole.

Threaded Entries

A rating of IP54 may be achieved with Pyrotenax glands tightened in the recommended manner. The entry hole should have threads of medium fit tolerance (a thread sealant is not normally required).

A rating of IP67 may be achieved by using a suitable thread sealant.



* Pyrotenax, Pyro, Pyro E, Pyro S and Multi Plus are trademarks of Tyco Thermal Controls LLC & its affiliates in designated countries.

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