

1. Purpose

This document provides important technical information and tips in the use of gel-filled station protectors during installation and maintenance with GoDigital OSP units. These station protectors provide the most reliable long term performance available with the latest in insulation displacement and environmental sealing technology but also require that a craft person be familiar with the individual protector's detailed use and mechanical functionality.

CAUTION: Gel-filled protector mechanical features and hook-ups are NOT intuitive the same as normally used with protectors in NIDS. Wires in and out of the protector are reversed from normal NID instructions.

If this is the FIRST TIME a craft person has used a gel-filled protector or product equipped with gel-filled protectors, GoDigital recommends that the user spend time IN DETAIL understanding the use and mechanical features of each protector. Recent experience has demonstrated that use of gel-filled protectors by untrained craft persons can result in significant difficulty in system turn-up and troubleshooting.

CAUTION: Most protectors are approved for use on service drops (POTS/ADSL) from GoDigital OSP units to subscribers. Most Protectors are NOT APPROVED for use on GoDigital DSL or SHDSL transport pairs. When replacing protectors in the field it is important to use either the EXACT replacement for a damaged protector, or use a protector from the correct APPROVED list. *See Section 4* of this TECH NOTE. Failure to use a protector from the correct approved list can result in erratic system operation and service.

2. Products

2.1 GoDigital Products

All new and all recently updated OSP products provided by GoDigital ship with (and can accommodate) gel-filled type station protectors.

2.2 Station Protector Type Overview

2.2.1 GoDigital publishes and maintains a list of APPROVED and NON-APPROVED station protectors for its products. The applicable list is published the XCel System Practice and is also normally printed at or near the end of the INST NOTE for any given product. *See Section 4* of this document for current APPROVED and NON-APPROVED Station Protection Devices.

2.2.2 GoDigital products that ship with and can accommodate gel-filled protectors can also accommodate older 356-style protectors as replacement protection. Older GoDigital products that were designed exclusively for 356-style protectors will NOT accommodate newer gel-filled protectors. 356-style protectors are also listed on the APPROVED and NON-APPROVED lists.

2.2.3 GoDigital has evaluated gel-filled protectors from three manufacturers: TII, Tyco and Corning. The MOST CURRENT information on protector features and mechanical functionality can be and SHOULD be obtained directly from these manufacturers.

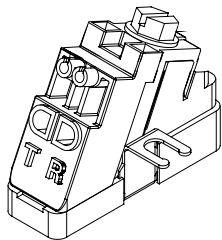
NOTE: *Section 6* on last page of this document provides website and contact information..

2.2.4 GoDigital provides relevant overview information for each of the three gel filled protector types in this document in the following Sections:

SEE Section 3.1

TII

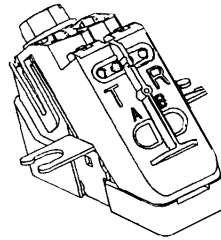
Angle Driver® Protectors



SEE Section 3.2

Tyco

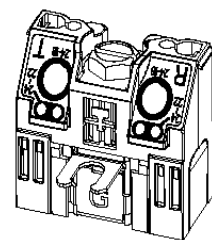
DataGuard® GSSP Protectors



SEE Section 3.3

Corning (Siecor)

TandAction® Protector



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Gel-Filled Protector Use with GoDigital OSP Units



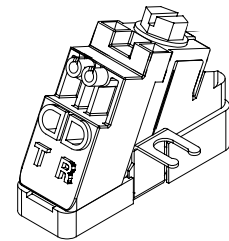
3. GoDigital Guidelines and Use Summaries for Gel-Filled Station Protectors

3.1 TII Angle Driver® Protector Use Highlights

TII Angle Driver protector ships on most/many new GoDigital Products in the DSL/SHDSL line positions (at time of writing). One version of this protector is APPROVED on both the DSL lines AND on the SERVICE Lines, however, it is not shipping on new products in the service line position (currently).

There are several versions of the TII Angle Driver protector, but only one version is APPROVED for use on the DSL/SHDSL line.

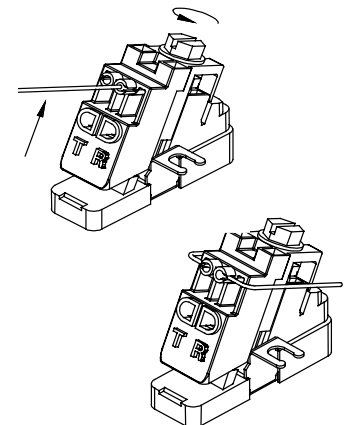
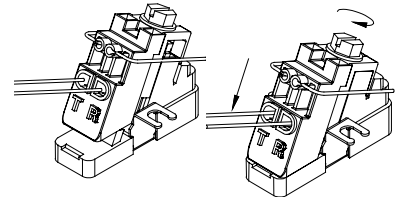
Check the GoDigital APPROVED listing prior to use.



TII Angle Driver Protector

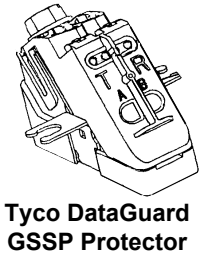
TII Angle Driver Installation Tips

1. CHECK APPROVED and NON-APPROVED USE LIST (if replacing a protector).
2. PROPER GROUNDING of the PROTECTOR is required prior to connecting telco wiring.
3. DO NOT USE STRANDED WIRE with gel-filled protectors.
4. USE 24 AWG or LARGER wire (24, 22, 19 etc.) for increased reliability (GoDigital recommends)
5. DO NOT STRIP INSULATION; Never strip insulation from wires with gel-filled protectors.
6. DO NOT REMOVE and REINSERT WIRES; Once wires have been removed from a gel-filled protector, ALWAYS cut/remove the old wire section (1/2 to one inch).
7. REPLACE ENTIRE PROTECTOR if a gas tube needs to be replaced.
8. INSTALL SERVICE DROPS: use LOWER PORTS labeled T and R, for connecting lines to the Subscriber.
Note: UPPER PORTS connect to the GoDigital electronics in the lid, are installed at the factory and should NOT be removed or loosened unless replacing the entire protector. UPPER PORTS have a STRAIN RELIEF slot enabling the Angle Driver LOWER PORT wires to be installed without disturbing the upper connections.
 - Unscrew Angle Driver to the full upright position
 - Do NOT STRIP wires. Recommended 19-24 AWG. Fully insert the two subscriber drop conductors (T-R) on the LOWER PORTS.
 - While holding the two wires in place, tighten the Angel Driver Screw to the full down position.
 - GENTLY PULL on the wires to verify connection.
9. REPLACING A PROTECTOR requires removal of both upper and lower conductors.
 - Unscrew Angle Driver to the full upright position and REMOVE the LOWER PORT conductors.
 - Carefully UNWRAP the UPPER PORT conductors from their strain relief slots, AND REMOVE.
 - REMOVE and DISCARD old DAMAGED PROTECTOR
 - MOUNT the NEW REPLACEMENT PROTECTOR with the grounding lug, and VERIFY PROTECTOR is properly GROUNDED.
 - Prior to installing conductors: TRIM CONDUCTORS (for UPPER and LOWER) approx. one half (1/2) inch, but do NOT REMOVE INSULATION.
 - Fully insert two lid conductors on the UPPER PORTS and secure UPPER WIRES in STRAIN RELIEF SLOTS.
 - INSTALL SERVICE DROPS in LOWER PORTS as per Item #8 above.
 - GENTLY PULL on the wires to verify connection.
10. LINE TESTING: See Paragraph 5 of this TECH NOTE.



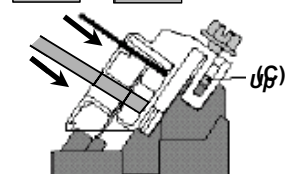
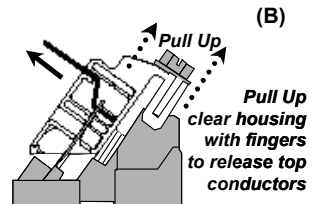
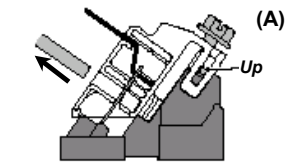
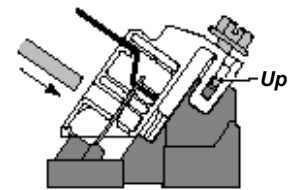
3.2 Tyco DataGuard® GSSP Protectors

The Tyco DataGuard protector ships on most new GoDigital Products on the SERVICE line (POTS and ADSL) positions (at time of writing). This protector and several Tyco variants are APPROVED as replacement protectors for SERVICE Lines. However, Tyco DataGuard is NOT APPROVED in any of its current versions for use on the DSL/SHDSL lines of GoDigital Systems. Check the GoDigital APPROVED listing prior to use.



Tyco DataGuard GSSP Installation Tips

1. **CHECK APPROVED and NON-APPROVED USE LIST** (if replacing a protector).
2. **PROPER GROUNDING of the PROTECTOR** is required prior to connecting telco wiring.
3. **DO NOT USE STRANDED WIRE** with gel-filled protectors.
4. **USE 24 AWG or LARGER** wire (24, 22, 19 etc.) for increased reliability (GoDigital recommends)
5. **DO NOT STRIP INSULATION**; Never strip insulation from wires with gel-filled protectors.
6. **DO NOT REMOVE AND REINSERT WIRES**; Once wires have been inserted and removed from a gel-filled protector, **ALWAYS** cut/remove the old wire section (1/2 to one inch).
7. **REPLACE ENTIRE PROTECTOR** if a gas tube needs to be replaced.
8. **INSTALL SERVICE DROPS (POTS/ADSL):** use **LARGE BOTTOM PORTS (A & B)**, for connecting lines to the subscriber. Note: SMALL TOP PORTS connect to the GoDigital electronics in the lid, are installed at the factory and should NOT be removed or loosened unless replacing the entire protector. The GSSP protector has a feature enabling the LARGE BOTOM PORT wires to be installed without disconnecting the SMALL TOP PORTS connections. Electrical continuity on small top ports is maintained during this step (in the up or "bolt loosened position) unless the housing is pulled. (see next step Fig B).
 - **UNSCREW DRIVER BOLT** to the full up position until it **SPINS FREELY**
 - Do NOT STRIP wires. Recommended 19-24 AWG. FULLY INSERT two service drop wires in LARGE BOTTOM PORTS.
 - While holding the two wires in place, **TIGHTEN** the Driver Bolt to the full down position. Do not over tighten
 - GENTLY PULL on the wires to verify connection.
9. **REPLACING A PROTECTOR** requires removal of both upper and lower conductors.
 - (Fig. A) UNSCREW DRIVER BOLT to up (SPINS FREELY) and REMOVE LARGE PORT conductors
 - (Fig. B) To REMOVE TOP PORT Wires: GRASP SIDES (upper clear plastic) and PULL UP on DRIVER with your fingers, then pull wires out of the top ports.
 - REMOVE and DISCARD old DAMAGED PROTECTOR
 - MOUNT the NEW REPLACEMENT PROTECTOR with the grounding lug, and VERIFY PROTECTOR is properly GROUNDED.
 - Prior to installing conductors: TRIM ALL CONDUCTORS (for TOP and BOTTOM) approx. one half (1/2) inch, but DO NOT REMOVE INSULATION.
 - UNSCREW DRIVER BOLT on NEW protector to full up (SPINS FREELY)
 - (Fig. C) Fully INSERT TWO CONDUCTORS from LID electronics on SMALL TOP PORTS, and INSTALL SERVICE DROPS in LARGE BOTTOM PORTS (per Item #8 above) and SCREW DOWN BOLT.
 - GENTLY PULL on the wires to verify connection.
10. **LINE TESTING: See Paragraph 5 of this TECH NOTE.**



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Gel-Filled Protector Use with GoDigital OSP Units



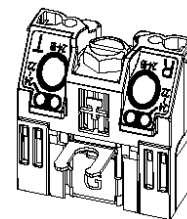
3.3 Corning (Sicor) TandAction® Protector

One version of the Corning TandAction protector is APPROVED for use on both the DSL lines AND on the SERVICE Lines for most GoDigital products.

On some new products TandAction protectors have shipped on the DSL/SHDSL lines.

However, there are several versions of the TandAction protector, and only one version is APPROVED for use on the DSL/SHDSL line.

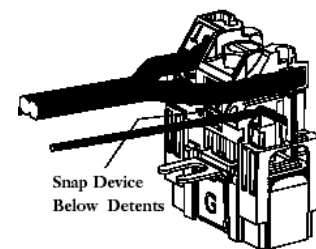
Check the GoDigital APPROVED listing prior to use.



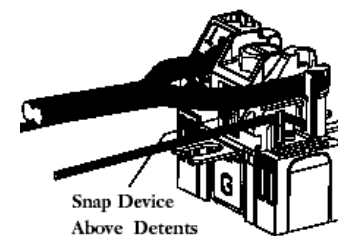
Corning
TandAction
Protector

Corning TandAction Installation Tips

1. **CHECK APPROVED and NON-APPROVED USE LIST** (if replacing a protector).
2. **PROPER GROUNDING** of the PROTECTOR is required prior to connecting telco wiring.
3. **DO NOT USE STRANDED WIRE** with gel-filled protectors.
4. **USE 24 AWG or LARGER** wire (24, 22, 19 etc.) for increased reliability (GoDigital recommends)
5. **DO NOT STRIP INSULATION**; Never strip insulation from wires with gel-filled protectors.
6. **DO NOT REMOVE AND REINSERT WIRES**; Once wires have been inserted and removed from a gel-filled protector, ALWAYS cut/remove the old wire section (1/2 to one inch).
7. **REPLACE ENTIRE PROTECTOR** if a gas tube needs to be replaced.
8. **INSTALL SERVICE DROPS: use LARGE UPPER PORTS (T and R)**, for connecting lines to Subscriber.
Note: SMALL LOWER PORTS connect to the GoDigital electronics in the lid.
UNSCREW THE CAP (counterclockwise) two turns until a click is heard.
 - Do NOT STRIP wires. Recommended 19-24 AWG.
 - Fully insert the two subscriber drop conductors (T-R) on the LARGE UPPER PORTS. Visually check wire insertion depth.
 - Hold the wires in place and screw the cap down (clockwise) until it stops.
Note: CAP MUST BE COMPLETELY DOWN to assure connection.
 - GENTLY PULL on the wires to verify connection.
Note: Once inserted, wires will remain in place when cap is unscrewed.
9. **REPLACING A PROTECTOR** requires removal of both upper and lower conductors.
 - UNSCREW THE CAP (counterclockwise) two turns until a click is heard.
 - REMOVE ALL CONDUCTORS from UPPER and LOWER holes.
 - REMOVE and DISCARD old DAMAGED PROTECTOR
 - MOUNT the NEW REPLACEMENT PROTECTOR with the grounding lug, and VERIFY PROTECTOR is properly GROUNDED.
 - Prior to installing conductors: TRIM CONDUCTORS (for UPPER and LOWER) approx. one half (1/2) inch, but do NOT REMOVE INSULATION.
 - FULLY INSERT WIRES:
 - Use the LARGE holes for SUBSCRIBER DROP wire termination.
 - Use the SMALL holes for LID ELECTRONICS termination wire.
 - Hold the wires in place and screw the cap down (clockwise) until it stops.
Note: CAP MUST BE COMPLETELY DOWN to assure connection.
 - GENTLY PULL on the wires to verify connection.
Note: Once inserted, the wires will remain in place when the cap is unscrewed.
10. **LINE TESTING: See Paragraph 5 of this TECH NOTE.**




Snap Device
Below Detents



Snap Device
Above Detents

4. Replacement Protector Options

GoDigital OSP units are shipped with protectors installed to provide lightning protection for the unit on each SERVICE line (POTS or ADSL) and for each DSL line. Replacement protectors are designated as follows:

NOTE: Protectors normally shipped with new products are identified with arrows. 

4.1 DSL Line Station Protectors

The protectors for the DSL lines require higher breakdown voltage than protectors for the service lines. For this reason, check when replacing DSL protectors in the field to make sure that an “APPROVED” DSL protector is being used. **Tables 4-1** and **4-2** specify APPROVED and NON-APPROVED replacement protectors for the DSL lines.

CAUTION: Use ONLY APPROVED PROTECTORS for DSL Lines. Most standard POTS station protectors will not operate properly on the line powered GoDigital DSL lines. Using a NON-APPROVED protector on an XCel System DSL line can result in erratic unit performance and service delivery.

Table 4-1: APPROVED Replacement Station Protectors for GoDigital DSL/SHDSL Transport



MFG	MODEL Number	Part #	TYPE	
TII	AD-03-W-FS	AD-03W-FS	Gas Tube	Gel
Corning	SPD 127-XV-S	SPD 127-XV-S	Hybrid	Gel
Corning	SPD 356-XY	SPD 356-XY	Hybrid	Non-Gel, 356-Style

Table 4-2: NON-APPROVED DSL/SHDSL Line Protectors

MFG	Model Number	Part #	TYPE	
TYCO	GSSP-0302-00-WOOB-A	225177-000	Gas Tube	Gel
TYCO	GSSP-0202-00-WOOB-A	455509-000	Gas Tube	Gel
TYCO	GSSP-0101-00-WOOB-A	301767-000	Gas Tube	Gel
TII	AD-M2-W-FS	AD-M2-W-FS	Gas Tube	Gel
TII	AD-02-W-FS	AD-02-W-FS	Gas Tube	Gel
TII	AD-01-W-FS	AD-01-W-FS	Gas Tube	Gel
TII	356M2	356M2	Gas Tube	Non-Gel, 356-Style
Corning	SPD 356-SW	SPD 356-SW	Gas Tube	Non-Gel, 356-Style

4.2 APPROVED Line Station Protectors for GoDigital SERVICE (POTS/ ADSL) Lines

Table 4-3 Specifies APPROVED replacement protectors for the Service POTS line drops.

Table 4-3: APPROVED SERVICE Line (POTS) Protectors



MFG	Model Number	Part #	TYPE	
TYCO	GSSP-0302-00-WOOB-A	225177-000	Gas Tube	Gel
Corning	SPD 127-XV-S	SPD 127-XV-S	Hybrid	Gel
TYCO	GSSP-0202-00-WOOB-A	455509-000	Gas Tube	Gel
TYCO	GSSP-0101-00-WOOB-A	301767-000	Gas Tube	Gel
TII	AD-03-W-FS	AD-03W-FS	Gas Tube	Gel
TII	AD-M2-W-FS	AD-M2-W-FS	Gas Tube	Gel
TII	AD-02-W-FS	AD-02-W-FS	Gas Tube	Gel
TII	AD-01-W-FS	AD-01-W-FS	Gas Tube	Gel
TII	356M2	356M2	Gas Tube	Non-Gel, 356-Style
Corning	SPD 356-SW (<i>Mfg. Disc.</i>)	SPD 356-SW	Gas Tube	Non-Gel, 356-Style
Corning	SPD 356-XY	SPD 356-XY	Hybrid	Non-Gel, 356-Style

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5. Line Testing

5.1 To isolate wires in top or bottom ports:

- Follow procedures in Section 3 to REMOVE SUBSCRIBER WIRE from LARGE PORTS.
- To TEST WIRES IN SMALL PORTS, insert test clips in test ports and perform test.
- To TEST SUBSCRIBER WIRES removed from large ports, connect test clips to wires.
- After testing is complete, TRIM WIRES 1/2", and RE-TERMINATE (insert) into LARGE ports.

5.2 Testing Complete Circuit

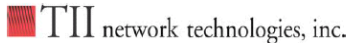
With all wires in place and driver in down position, insert standard test clips in test ports.

5.3 Cleaning Tyco DataGuard GGSP

Small bits of wire stuck in the Tyco protector can be cleaned. The plastic clasps on either side can be manually released, the clear plastic module comes off and any bits of wire can be removed.

6. Additional Information

6.1 TII Angle Driver® Information



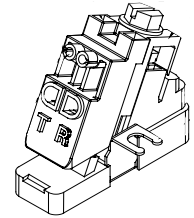
Angle Driver, Total Failsafe and TFS are trademarks of TII

TII Products Telephone Customer Service:

1-888-844-4720

Web LINK to TII Angle Driver Station Protector Data Sheet:

http://www.tiinetech.com/products/datasheets/1_209.pdf



6.2 Tyco DataGuard® GSSP® Protector Information

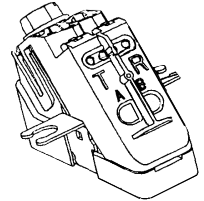


Raychem, DataGuard, GSSP, and SSB are trademarks of Raychem Corporation

Tyco Telecommunications Products Telephone Cust. Svc: 1-888-557-8901

Web LINK to Tyco GSSP Station Protector Data Sheet:

<http://station-protector.telecomosp.com/copper1.cfm?Polybrands=gel-idx-fiber-KR-200701.cfm&Body=gssp-KR-110601.cfm&Title=DataGuard%20Station%20Protector&ThisSite=station-protector>



6.3 Corning/Siecor TandAction® Protector Information



Discovering Beyond Imagination

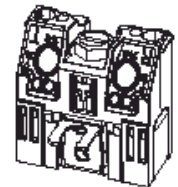
TandAction is a trademark of Corning Cable Systems LLC.

Web LINK to Corning TandAction Station Protector Data Sheet:

<http://www.corningcablesystems.com/web/library/litindex.nsf/Market%2FApplication%5CILEC%5CCustomer+Premises%7CILECCustomerPremises/DF38F44337BE2B6285256C1B0064F61D?OpenDocument>

Web LINK to Corning TandAction Station Protector Data Sheet:

<http://www.corningcablesystems.com/web/library/litindex.nsf/Market%2FApplication%5CILEC%5CCustomer+Premises%7CILECCustomerPremises/54040EC1AA3E7A9D852564C100411561?OpenDocument>



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