

Communications quickstart guide

Model 576 LCD ETU



VL circuit breaker

Answers for industry.

SIEMENS



General Information

VL Circuit Breakers

Due to their compact design, the VL circuit breakers meet the high requirements of today's electrical distribution systems. They are available both with thermal-magnetic (50A to 1600A) and with electronic trip units (30A to 1600A).

The basic circuit breaker is designed for fixed mounting and can easily be modified for a plug-in or a withdrawable application using the appropriate kit. The available VL circuit breakers are especially suitable for applications in the factory, in motor or generator protection, in starter combinations or as molded case switches.

Communication Information

The VL can be connected to PROFIBUS DP via the COMPRO module or to MODBUS via the COMMODO module. In order to connect to either communication module the 576 LCD electronic trip unit (ETU) must be used.

On the model 576 ETU the current in each phase is continuously shown on the display. Unlike many displays, no secondary or auxiliary voltage is required as long as the breaker is energized and a minimal load current is present. These trip units can also indicate the "last trip" status (date, time, amps). When the trip units are connected to a system (PLC or PC) master an event log is stored (last 10 events). Example system architectures for both PROFIBUS and MODBUS are available on page 3.

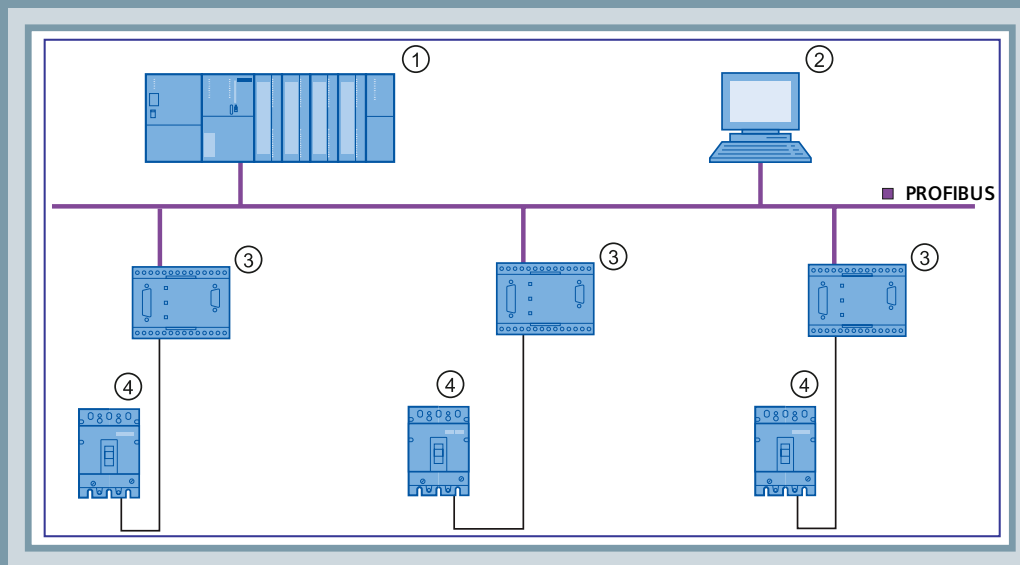
VL LCD ETU576 Communication Basics

- COMPRO module provides PROFIBUS DP and DPV1 interface
- COMMODO module provides MODBUS interface
- See wiring diagram (page 10) for COMMODO and COMPRO connection requirements
- PROFIBUS / MODBUS address of COMPRO / COMMODO can be set with VL LCD ETU, Switch ES Power or WL and VL Configurator Software
- All key events are assigned a time stamp by the integrated clock in the COMPRO / COMMODO when the modules are connected to a system master
- The COMMODO, COMPRO and COMPS include Zone Selective Interlocking (ZSI) capabilities
- The COMPRO, COMMODO and COMPS require 24VDC control power
- SIMOCODE independently could also be utilized for PROFIBUS communications

VL Communication Software Offerings

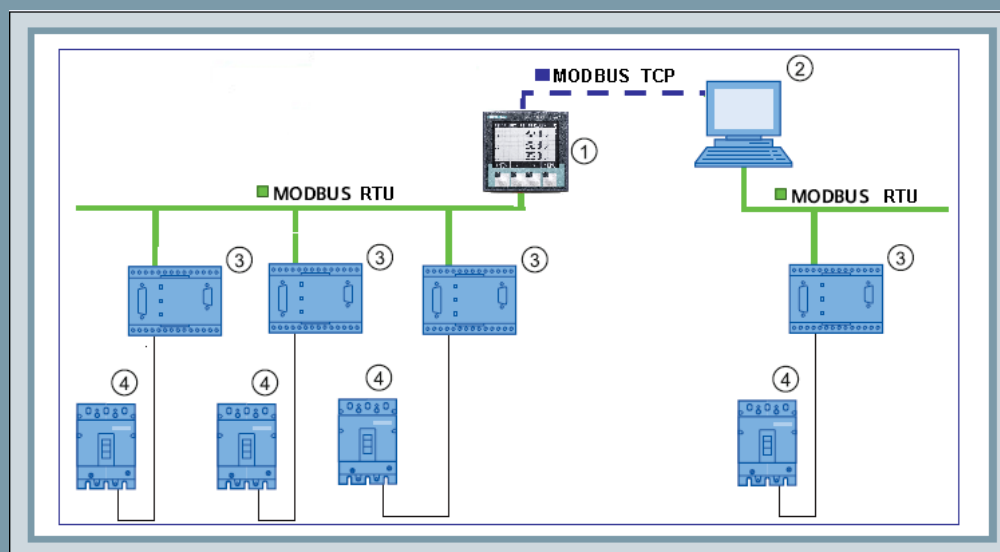
- Switch ES Power (PROFIBUS)
- WL & VL Configurator Software (MODBUS)

Example PROFIBUS System Architecture



- ① PLC Master, e.g. SIMATIC S7
- ② PC with Switch ES Power
- ③ COMPRO
- ④ VL Circuit Breaker with model 576 LCD ETU

Example MODBUS System Architecture



- ① TCP gateway provided by Siemens advanced power quality meters (PAC4200 shown)
- ② PC with WinPM.Net Power monitoring and management system
- ③ COMMOD
- ④ VL Circuit Breaker with model 576 LCD ETU

Connections & Transferrable Data

Model 576 LCD ETU



- 1 Test Kit & Power Stick Connections
- 2 COMMOD & COMPRO Connection

COMMOD / COMPRO Module



- 1 LCD ETU Connection
- 2 LEDs:
 - 1. Trip Unit
 - 2. MODBUS/PROFIBUS Status
 - 3. COMMOD/COMPRO Status
- 3 Terminals
- 4 PROFIBUS & MODBUS Connection
- 5 Terminals

Transferable Data via COMMOD/COMPRO

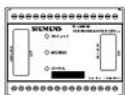
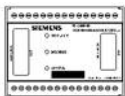
Transferrable data
Protection Settings & Alarms
Phase current with min./max. value and time stamp
Pre-alarms with time stamp (from communications unit): Overload, ground fault, neutral overload, phase unbalance, demand
Threshold violation with time stamp (from LCD ETU): Overload, ground fault, neutral overload, phase unbalance, demand
Tripped signals with: cause of tripping operation, tripping current and time stamp
Overload alarm (from LCD ETU)
Min./Max. value and time stamp: Phase demand, average demand, neutral, ground
Clear alarm and tripping events
Clear min./max. measure values
Read/write protection settings to LCD ETU
Control
Switching ON or OFF (with stored energy operator)
Time coordination
ZSI functionality (compatible with the WL circuit breaker)
Diagnostics
Number of switching cycles
Number and type of LSIG tripping operations
ON or OFF status
Operating hours
Clear maintenance information
Device Identification
Serial number of the trip unit
Software version of the trip unit and the COMMOD/COMPRO

Technical data: COMMOD/COMPRO

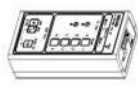
Category	Data
Operating voltage minimum/maximum	18/30 VDC
Current consumption requirement while connected VL 576 LCD ETU	110 mA
Power loss minimum/maximum	1.5 / 4.1 W
Temperature range minimum/maximum	-20/75 °C



Communications Accessories

Picture	Catalog Number	Description
	COMPRO	PROFIBUS communication module with ZSI
	COMMODO	MODBUS communication module with ZSI
	COMPS	ZSI module & LCD power supply
	WLCONFIG	MODBUS communication kit: RS232 to RS485 adapter & serial communication cable
	COMKIT1	Cable connection between COMMODO/COMPRO and 576 LCD ETU 3 ft. (1 m.) in length. For DG, FG, NG & PG Frames
	COMKIT2	Cable connection between COMMODO/COMPRO and 576 LCD ETU 3 ft. (1 m.) in length. For JG, LG & MG frames
	COMEXT	Extension cable for COMKIT1 & COMKIT2 6 ft. (2 m.) in length

Electronics Accessories

Picture	Catalog Number	Description
	EPSP18V	Power Stick: Hand held, battery operated power supply, for offline program of LCD trip units (requires two 9V batteries)
	ELTPHB	Test Kit: Portable power supply for programming, trip test, and checking CT's plus a port for local communications of current flow and trip settings (requires three 9V batteries)
	UPAPELTK	Universal Power Supply: 120/240 VAC adapter used in lieu of 9V batteries for test kit ELTPHB (includes necessary cables)
	COMPCA	Spare flat cable for test kits and communication adapters
	COMP232	RS232 type cable for test kits or communications adapters



Software Offerings

General Information

There are two software offerings for communication with the 576 LCD ETU for the VL circuit breakers.

The two software offerings are:

- Switch ES (PROFIBUS)
- WL and VL Configurator (MODBUS)

Both software offerings have the ability to set the protective settings, functions and set points of the VL trip unit. Installing all of the software is a simple and intuitive process, with step-by-step instructions for the user.

PROFIBUS Information (Switch ES)

Ordering information: Switch ES Power V1.x is available on CD-ROM by ordering catalog number 3ZS23110CC100YA0.

The CD-ROM also includes:

- Standard browser for the "*.html" online help and for printing.
- Acrobat Reader for opening manuals/operating instructions in "*.pdf" format.
- PROFIBUS communication manual for the VL and WL circuit breakers.
- GSD file.

Computer requirements:

To be able to work with Switch ES Power V1.x, the following requirements must be met:

- Operating systems Microsoft Windows 95, 98, NT 4.x, 2000, ME, or XP Professional
- Minimum 128MB RAM and 1.3 GHz processor
- PROFIBUS DP interface
- CD-ROM drive

MODBUS Information (WL and VL Configurator)

Ordering information:

A RS232 to RS485 converter and serial cable are available by ordering catalog number WLCONFIG.

The WL and VL configuration software can be downloaded for free from the Siemens website under the software downloads section of: www.sea.siemens.com/breakercommunications

Computer requirements:

To be able to work with the WL and VL Configurator Software the following requirements must be met:

- Windows 2000 or XP PC
- Minimum 128MB RAM and 1.3 GHz processor
- PC with an available COM port

Zone Selective Interlocking -ZSI

General Information

Zone Selective Interlocking (ZSI) is a method which allows two or more circuit breakers to communicate with each other so that a short circuit or ground fault will be cleared by the breaker closest to the fault with a minimum time delay. The primary goal of ZSI is to limit stress on the distribution system by clearing a fault in the shortest time without sacrificing coordination. Fault conditions can cause thermal and mechanical stress including damage to conductor insulation, damage to breaker and bus bar supports, and in the worst case, melted or burned components. The benefits of ZSI are lower potential costs of system damage due to the reduced time to clear faults and increased uptime because coordination is not sacrificed.

ZSI with VL Circuit Breakers

Siemens VL circuit breakers require a Model 576 LCD ETU (below left) for zone selective interlocking. Also, a COMPRO, COMMOD, or COMPS (below) is required for each circuit breaker that is to be integrated into the ZSI scheme.

Many combinations of modules and both VL and WL circuit breakers are possible with Siemens's ZSI system. The combination shown below is just one possible example of a ZSI network. The example shows 5 zones and incorporates both VL and WL circuit breakers in those zones. It can be seen from the Short Time delays (tsd) that the circuit breakers are selectively coordinated. The ZSI function in the individual ETU will lower the Short Time delay for the breaker immediately upstream of the fault to reduce the time that the fault is seen by the system. If for some reason the fault is NOT cleared by this first breaker the next breaker upstream will trip after its set time delay to provide backup protection.



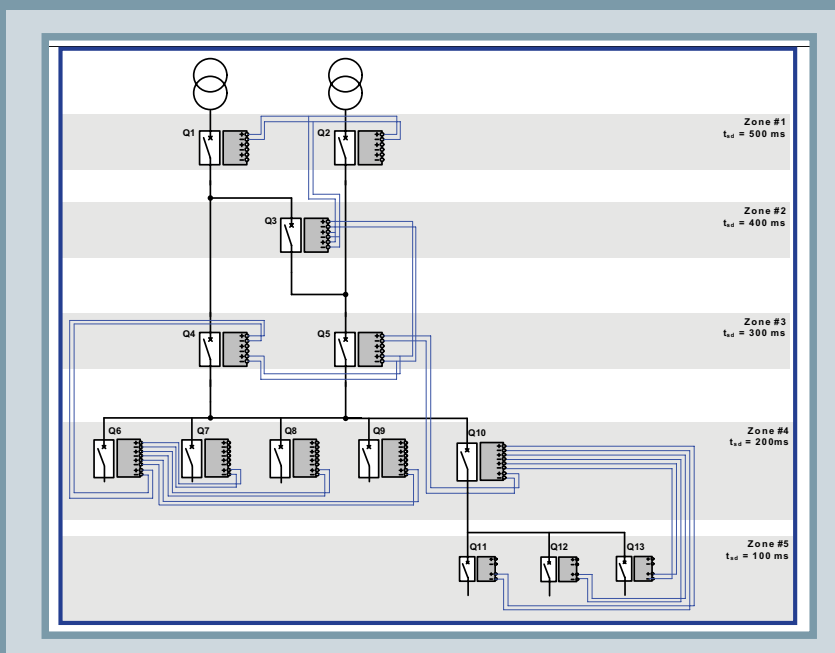
Model 576 LCD ETU



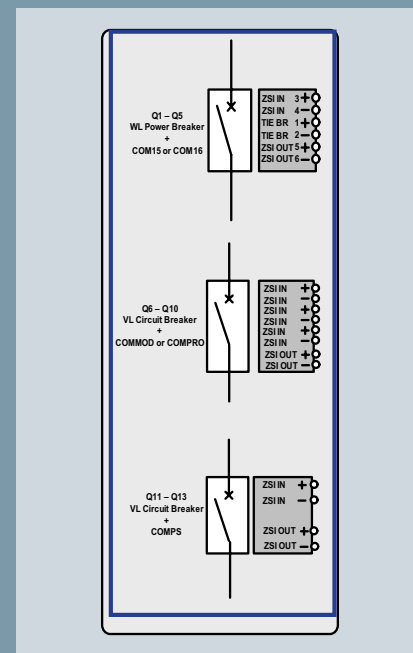
COMMOD / COMPRO Module



COMPS –ZSI Module and ETU Power Supply



Example ZSI Network



ZSI Connections

Zone Selective Interlocking –ZSI

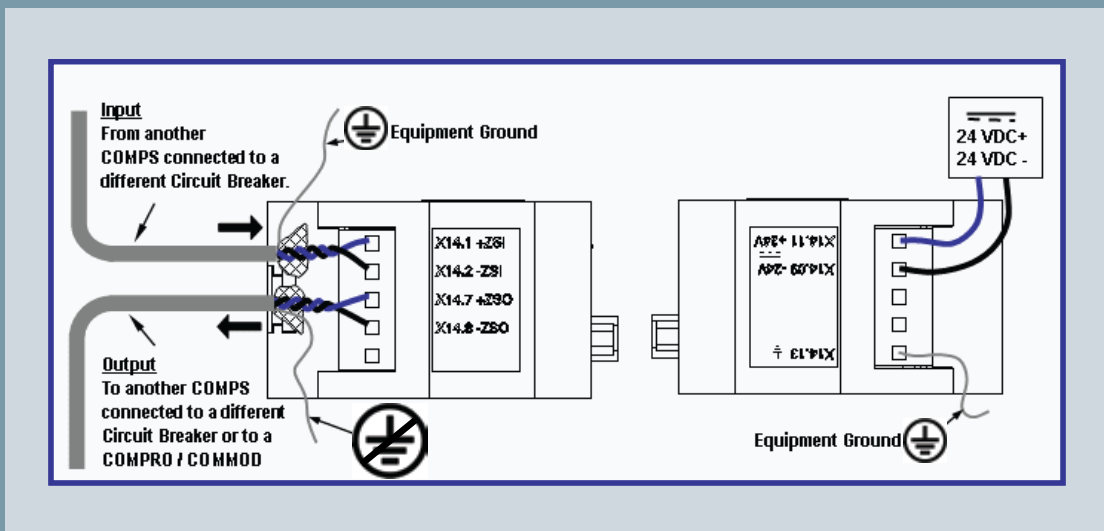
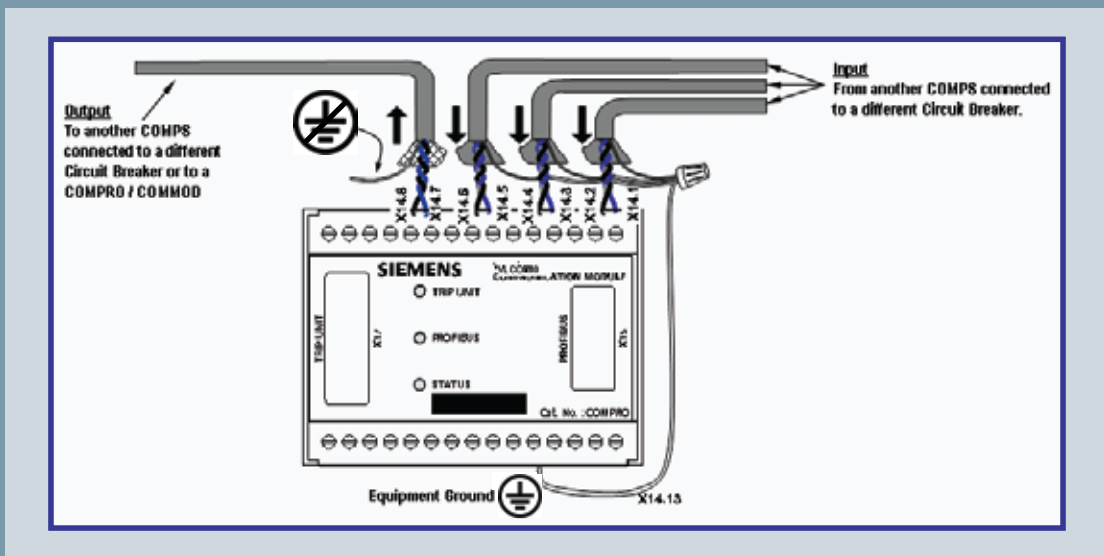
COMMODO, COMPRO and COMPS Connections

In a typical ZSI system, each circuit breaker must be wired to all the other circuit breakers via the “ZSI In” and “ZSI Out” terminals.

In the case of Siemens VL circuit breakers these terminals are located on the COMMODO, COMPRO, and COMPS modules. In the event of a short circuit or ground fault, all circuit breakers communicate to determine and isolate the exact location of the fault; only the closest upstream circuit breaker will be opened. See the VL Circuit Breaker wiring diagram at the end of this guide for the required components, connectors, terminal points, and cables. When the ZSI function is used, the ZSI output (ZSI Out) on the COMMODO, COMPRO or COMPS must be connected to a ZSI input (ZSI In) on the COMMODO, COMPRO or COMPS of the next highest fault zone (see diagrams below).

Maximum Pin Assignments

A maximum of one cable can be connected to each ZSI input on the COMMODO, COMPRO and COMPS. Each COMMODO and COMPRO can receive up to three further signals from other COMMODOs and COMPROs (see figures below). The connection between the ZSI interfaces is established with a twisted-pair cable.



Installation Guide

1. Wire the stored energy operator (if required), LCD trip unit and communications module per the wiring diagram on page 10.
If remote operation is not required, simply leave the stored energy operator terminals open.
2. Connect X15 output of the COMPRO / COMMOD to the PROFIBUS / MODBUS network.
3. Check the lights on the module per the figures below.
4. Run the Switch ES software to begin communicating over PROFIBUS or run the WL and VL Configuration Software to communicate over MODBUS.

COMMOD - Definition of LEDs		
Trip Unit LED		
	Off	No voltage on the COMMOD
①	Red	No communication with the LCD ETU
	Green	Communication with the LCD ETU
MODBUS LED		
	Off	No voltage on the COMMOD
②	Red	Bus error, no communication with master
	Green	MODBUS communication made
COMMOD Status LED		
	Off	No voltage on the COMMOD
③	Red	Internal fault, communication not possible
	Green Flashing	Internal self-test completed successfully



COMMOD - Definition of LEDs		
Trip Unit LED		
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Resources for additional information

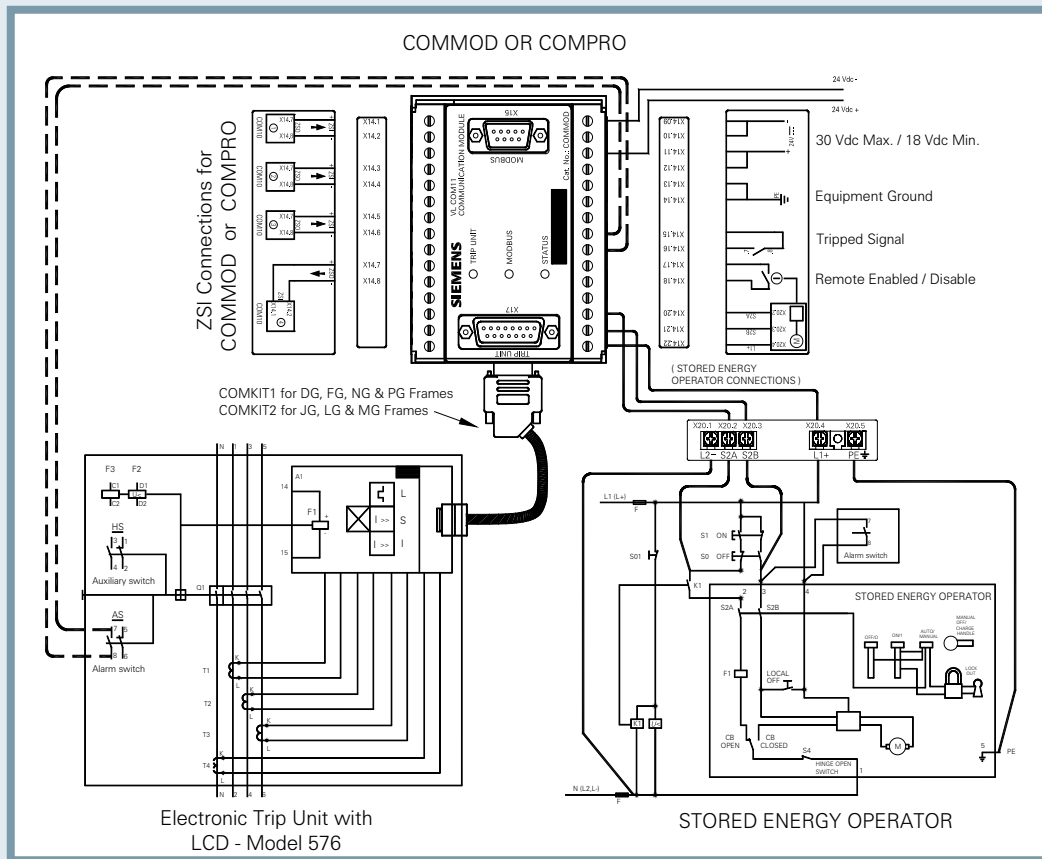
1. Siemens Circuit Breaker homepage: www.sea.siemens.com/circuitbreakers
2. PROFIBUS International: www.profibus.com
3. MODBUS-IDA: www.modbus.org

Wiring Diagram: COMMOD & COMPRO

VL Circuit Breaker COMMOD / COMPRO

Module Wiring Diagram

VL Electronic Trip Unit with LCD - Model 576



NOTE 1: See instruction sheet for terminal cable barrier required at ETU576 trip unit cable connection.

NOTE 2: Extension cable COMEXT is available to extend the ETU to COMPS cable an additional 2 meters.

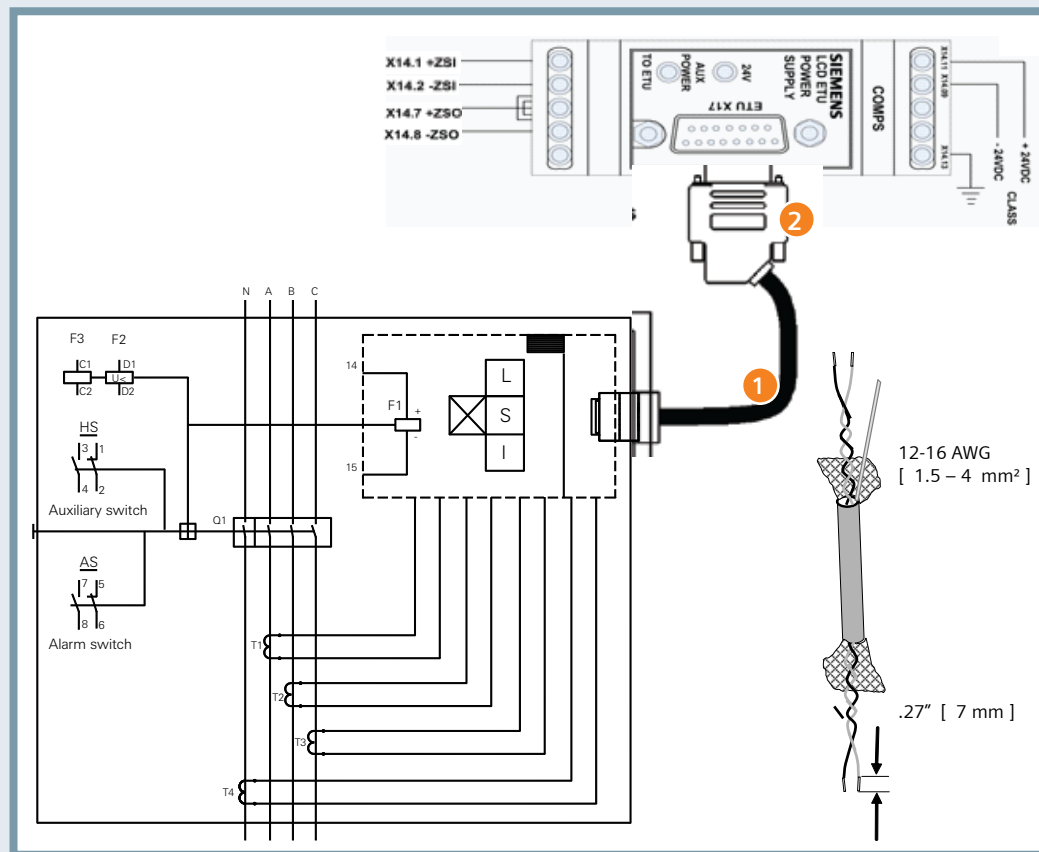
NOTE 3: Twisted-shielded pairs are to be used for ZSI and ZSO cable runs, shield for ZSI input terminals to be connected to equipment ground X14.13, shield for ZSO output terminals is not to be grounded.

Wiring Diagram: COMPS

VL CIRCUIT BREAKER COMPS

MODULE WIRING DIAGRAM

VL Electronic Trip Unit with LCD – Model 576



1 Communications Cable-
COMKIT 1: DG, FG, NG & PG
framesCOMKIT2: JG, LG, and
MG frames

2 To 15 Pin Connector on
COMPS Module (ETU X17)

NOTE 1: See instruction sheet for terminal cable barrier required at ETU576 trip unit cable connection.

NOTE 2: Extension cable COMEXT is available to extend the ETU to COMPS cable an additional 2 meters.

NOTE 3: Twisted-shielded pairs are to be used for ZSI and ZSO cable runs, shield for ZSI input terminals to be connected to equipment ground X14.13, shield for ZSO output terminals is not to be grounded.

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