

Product Description

Table of Contents

<u>Section</u>	<u>Page</u>
Introduction	
Qualified Persons	2
Read this Instruction Sheet	2
Retain this Instruction Sheet.	2
Proper Application.	2
Special Warranty Provisions	2
Safety Information	
Understanding Safety-Alert Messages	4
Following Safety Instructions	4
Replacement Instructions and Labels	4

<u>Section</u>	<u>Page</u>
Safety Precautions	5
Description	
Overview	6
Features	8
Optional Features	9



Introduction

Qualified Persons

WARNING

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards.

A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended only for such qualified persons. They are *not* intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating your S&C IntelliCap Plus Automatic Capacitor Control. Familiarize yourself with the Safety Information on page 4 and Safety Precautions on page 5. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C IntelliCap Plus Automatic Capacitor Control. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication must be selected for a specific application. The application must be within the ratings furnished for the selected equipment.

Special Warranty Provisions

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to the S&C IntelliCap Plus Automatic Capacitor Control, except that the first paragraph of the said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for installation in third-party equipment, the end user of the equipment. The seller's duty to perform under any warranty may be delayed, at the seller's sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

Replacement parts provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement parts purchased separately will be covered by the above special warranty provision.

Warranty of the S&C IntelliCap Plus Automatic Capacitor Control is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets.

This warranty does not apply to major components not of S&C manufacture, such as communication devices. However, S&C will assign to the immediate purchaser or end user all manufacturer's warranties that apply to such major components.

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. The seller is not liable if an act of nature or parties beyond S&C's control negatively impact performance of equipment/services packages; for example, new construction that impedes radio communication, or changes to the distribution system that impact protection systems, available fault currents, or system-loading characteristics.

Safety Information

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to the S&C IntelliCap Plus Automatic Capacitor Control. Familiarize yourself with these types of messages and the importance of these various signal words:

DANGER

“DANGER” identifies the most serious and immediate hazards that *will likely* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

WARNING

“WARNING” identifies hazards or unsafe practices that *can* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

CAUTION

“CAUTION” identifies hazards or unsafe practices that *can* result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

“NOTICE” identifies important procedures or requirements that *can* result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C’s website sandc.com Or call S&C Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating your S&C IntelliCap Plus Automatic Capacitor Control.



Replacement Instructions and Labels

If you need additional copies of this instruction sheet, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER



The S&C IntelliCap Plus Automatic Capacitor Control line voltage input range is 93 to 276 Vac. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. QUALIFIED PERSONS. Access to the IntelliCap Plus Automatic Capacitor Control must be restricted only to Qualified Persons.

2. SAFETY PROCEDURES. Always follow safe operating procedures and rules. Always maintain proper clearance from energized components.

3. PERSONAL PROTECTIVE EQUIPMENT. Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, arc-flash

clothing, and fall protection, in accordance with safe operating procedures and rules.

4. SAFETY LABELS AND TAGS. Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels and tags. Remove tags ONLY if instructed to do so.

5. MAINTAINING PROPER CLEARANCE. Always maintain proper clearance from energized components.

Description

Overview

The IntelliCap Plus Automatic Capacitor Control is one of S&C Electric Company's family of distribution automation control products. It controls the capacitor bank based on voltage, time, and temperature strategies, with optional current and var strategies. Neutral Current and Neutral Voltage strategies detect problems with the bank, and the IntelliCap Plus control can take corrective action. This versatile control is designed for maximum accuracy and reliability.

IntelliCap Plus control parts are shown in Figure 1, and Figure 2 on page 7.

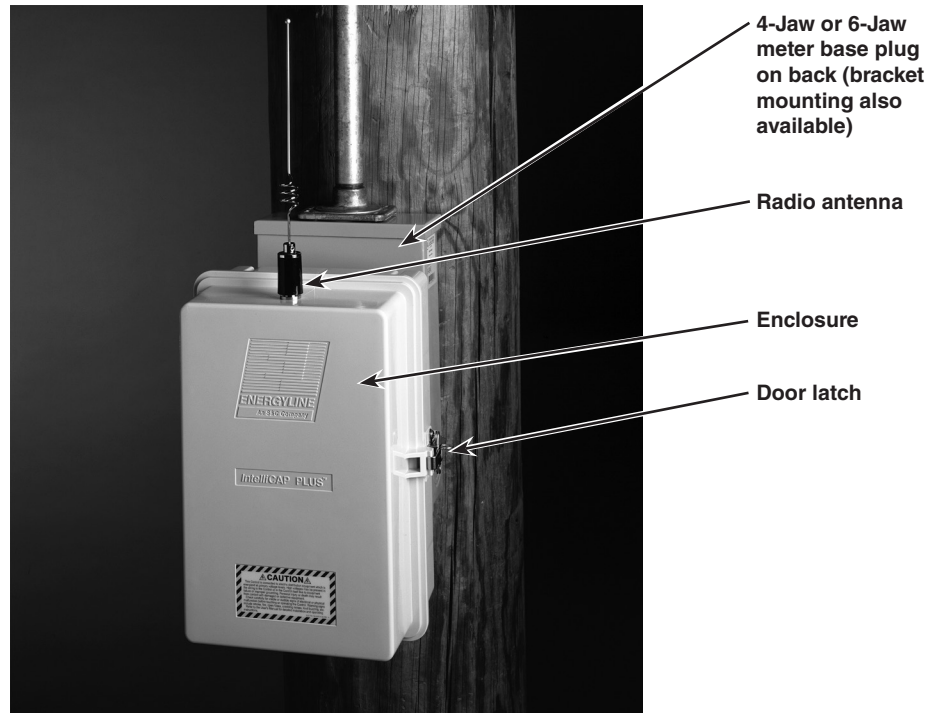


Figure 1. Exterior of the IntelliCap Plus Control.

Capacitor control enclosure—The non-corrosive, impact-resistant, LEXAN enclosure provides weatherproof and tamper-resistant protection for the capacitor control.

Meter base plug or bracket mounting options—A 4-jaw or 6-jaw meter base plug on the enclosure provides easy mounting into existing capacitor control (meter) sockets. Bracket-mount and wall-mount options are available with 5-pin or 7-pin connectors and cabling.

Temperature sensor—It monitors ambient temperature and provides the information needed to switch capacitor banks using any of the temperature-dependent automatic control strategies: Temperature, Time-Biased Temperature, Timeclock with Temperature Override, Current with Temperature Override, and Var with Temperature Override.

Door latch—The stainless-steel latch, with a 7/16-inch (11 mm) hole, allows padlocking the enclosure for security.

Phase and neutral sensor cable connector (optional)—This provides a connection point for sensor signals from a phase-current sensor and a neutral-current or neutral-voltage sensor. Var controls are compatible with S&C or Lindsey current sensors, Fisher Pierce 1301 Line Post sensors, and Piedmont Electric current sensors. Input for 0-5 amp current transformers is optional. Sensor connections can be made with a 6-jaw meter base or an optional mil-spec connector on the bottom of the control. A control with current transformer sensing may be supplied with optional 3-foot leads for connection to CT shorting, switches, and a separate capacitor bank switching device power source.

Neutral-current controls—These controls detect high-current levels between the starpoint and ground of a grounded, wye-connected capacitor bank. The control generates an alarm and can switch the capacitor bank appropriately. This helps mitigate damage caused by phase-voltage imbalances caused by faulty capacitor units, faulty switches, or blown fuses.

Neutral-voltage controls—These controls detect high-voltage levels between the starpoint and ground of an ungrounded, wye-connected capacitor bank. The control generates an alarm and can switch the capacitor bank appropriately. This helps mitigate damage caused by phase-voltage imbalances caused by faulty capacitor units, faulty switches, or blown fuses.



Figure 2. IntelliCap Plus Control with the door open.

Faceplate LED displays and buttons—Clearly labeled LED displays provide information about the present state of the capacitor control. Buttons permit local, manual commands.

Faceplate local communication port—A user's computer can be connected to the capacitor control with a DB9 cable, and IntelliLink® Setup Software can be used to view data, change setpoints, download logged data, and update control software.

Optical port (optional)—The optical coupler transmits the same data supplied to the DB9 local communication port.

Door retainer—The enclosure door is held open while you access the faceplate.

Communication equipment (optional)—The IntelliCap Plus Capacitor Controls support a variety of communication hardware options and software protocols for two-way communication between the capacitor control and a SCADA master station or one-way paging communication.

Terminal strip—This is the intermediate connection point for wires carrying signals to and from the capacitor bank. The enclosure is pre-wired at the factory for simple installation. Field wiring is required when a unit is ordered with only the terminal strip.

Test points—These provide convenient circuit access for troubleshooting the control and measuring voltage and signal inputs to the control.

Control software—The firmware manages all control functions. Users can update the control software easily with IntelliLink Setup Software installed on their computer. There is no need to change the memory chip for a software update.

IntelliLink Setup Software—This software is installed in the user's Microsoft® Windows® computer. It lets users verify and change all setup and configuration parameters, monitor real-time operating data, perform troubleshooting, view data-logging results, create reports and graphs, and export data for use in spreadsheets.

Description

Features

All IntelliCap Plus controls include the following features:

Dependable quality—The electronics are manufactured in an ISO 9002-certified plant.

Toughness and reliability—The control is designed to withstand the difficult environmental and electrical conditions found in electric distribution applications.

Rugged, well-proven core electronics design—The microprocessor, memory, and all related components are based on technology developed for S&C's full range of control products (with more than 150,000 units in the field since 1985).

Sophisticated automatic control logic—The control ensures effective use and switching of the capacitor bank, improves var correction, and minimizes customer voltage complaints.

Extensive data logging capabilities and online graphing—Historic data are useful for both stand-alone and communications-oriented applications. The IntelliLink software lets users view graphs of logged data to get a quick overview of trends.

Flexible communications capabilities—Users can use the DB9 port on the faceplate for communication with their computer and the SCADA port for remote-communication applications.

Setpoint control of operating parameters—Users can view and change automatic operation options and other operating parameters as needed.

Non-volatile memory—Programming, setpoints, and data are stored in non-volatile memory for maximum field functionality and reliability.

Real-time clock—The crystal-controlled clock provides accurate timing for control purposes and for time stamping historic data logs.

Reclose block—The five-minute delay after switching the bank out allows the capacitors to discharge fully before reclosing. This minimizes the transient overvoltages caused by charge trapped on the capacitors. During programming and testing, technicians can use a password to circumvent the reclose block when the capacitor bank switching device is inoperative.

Harmonics data—The control calculates the 1st (fundamental), 3rd, 5th, and 7th harmonics, as well as the total harmonic distortion (THD), every 15 minutes. Users may choose the type of harmonic data the control logs: voltage, current, or neutral voltage/neutral current, as applicable, and the THD can be calculated by either the IEEE or IEC method.

Capacitor control shipped ready to install—The control is modular and cables have connectors. It requires no discrete field wiring other than 110-240 Vac control power. The default setpoint values are industry averages, and many users can install the controls without needing to change them. Then they can adjust the settings when field-performance reports are available.

Adjustable data logging—The logging interval for voltage and temperature information (as well as current, power factor, kvar, kW, and neutral current/neutral voltage information, if applicable) can range from 1 minute to 1 hour for 2 to 120 days of data recording.

Data available for use in spreadsheets—Logged data and setup information can be downloaded to a CSV (comma-separated value) file and imported into spreadsheet or word processing software for analysis.

Snapshots—Snapshot files let users view data, generate reports, and save or change setpoint configuration files even when they are not connected to a capacitor control.

Optional Features

With optional sensing ability, the IntelliCap Plus control has the following features:

Compensation for load-side current sensors on controls using a current or var strategy—While the preferred current-sensor location for a var control is the source side of the bank, controls function correctly with current sensors installed on the source or load side, with normal or reverse current.

Intelligent handling of reverse power conditions—Users may select how their var control operates during a reverse power condition.

Custom current-signal conditioning—The control is specifically designed and tested for the installed current sensor.

Neutral-current or neutral-voltage detection—The control monitors alarms and, if desired, takes corrective action on abnormal levels of neutral current or neutral voltage. The neutral-sensing feature must be specified when ordering a control. The control monitors and alarms on the fundamental component or total RMS of neutral current and neutral voltage.