PSW Pre-Start Warning System

MDA Ex (ib) 10187 ANZEx 11.3003X

1. Description

The Ampcontrol Pre-Start Warning System (PSW) has been designed by Ampcontrol to fulfil the requirements of the Australian Standard 1755 (Conveyor Safety Requirements), where pre-start warning devices are required on all new conveyors. The System also complies with Australian Standard AS2380 (Explosion protected, Intrinsically Safe).

Ease of installation into existing conveyors was an important design consideration incorporated in the PSW design. The existing coil connection to the main drive motor control relay is simply redirected through the PSW Controller. Also taken into account was the advance and retraction of conveyors, which is standard practice in underground mining applications.

The PSW Controller performs the necessary pre-start warning function when a start condition of the conveyor is initiated.

The controller has two relays used for control and fault indication. A LED display indicates System Status and pinpoints fault locations. Four open collector, common emitter opto-isolated outputs allow monitoring by PLC/SCADA systems. Two 16 position rotary switches set the number of Audio Visual Modules (AVM's) connected to the system and the number of alarm cycles. This allows the system to be configured without power being applied.

The PSW Controller is DIN rail mounted and is powered from a type PSW 110/240VAC/20-0-20VAC Power Supply Module (specify input voltage at time of order).

The controller is connected to a minimum 0.75mm^2 two-wire circuit to the AVM's in the field. These units incorporate piezo alarms and high intensity LEDs to provide warning tones and a light flash that progress along the string of modules.

The AVM's are down line powered eliminating the possibility of battery failure and increasing system reliability. Up to 15 Audio AVM's can be installed on one Intrinsically Safe System. Multiple IS systems can be used simultaneously on long conveyors or where additional modules are required.

2. Features

- Low cost installation
- Relay output (Control and Fault)
- Open collector opto-isolated outputs (for PLC monitoring)
- DIN rail or foot mount
- LED Indication to aid fault finding
- Mines Department Approved for Intrinsically Safe Applications
- Down line powered Audio Visual Modules

3. Application

The PSW Controller and Power Supply are installed in the conveyor starter. The Controller is connected to the respective control circuits (see typical installation) and the two wire line to the field AVM's. The AVM's are compact, offering a simple stud mounting direct onto the pullkey. Separate mounting is also an option.

When power is applied, the Controller enters the stand-by mode waiting on the initiate input to be activated. The initiate input must be active for a minimum of 200mS before an alarm sequence is initiated. Once initiated, the rotary switch configuration is scanned and used for that alarm duration. The initiate input is checked at the end of each alarm cycle. If lost the next cycle is aborted and the system returns to the standby mode.

The system is a secure system. The PSW Controller monitors the operation of all AVM's. The control relay will energise after 50% of the selected number of alarm cycles have been completed. If a fault occurs the control relay will de-energise. System Status is indicated by a combination of LED's and a 7 Segment Display according to Table 1, over the page.

PSW Controller Status Indication

LED/OPTO	7 Segment Display	RELAYS	
		CTRL	AUX
Alarm Active (AA)	Indicates number of currently operating AVM	In *	In
Short Circuit (SC)	Indicates short circuit between displayed module number and previous module	Out	Out
Too Many (TM)	Indicates the number of modules detected which is greater than the rotary switch setting	Out	Out
Too Few (TF)	Indicates the number of modules detected which is less than the rotary switch setting	Out	Out
None	" – " Hyphen indicates standby mode	Out	In
None	" 8 " Figure 8 pattern indicates alarm issued	In	In

* Relay operates after 50% of the selected number of cycles

Table 1

The system can be defeated by setting both rotary switches to 0 (zero). During this mode there are no AVM cycles and the control relay operates only whenever the initiate input is activated.

4. Specifications

Power Supply

20-0-20VAC ± 10% 15VA 50Hz

Relay Outputs

Control and Auxiliary Relays
1 C/O 240 VAC, 5A 100VA maximum

Initiate Input

110~240VAC

Cycles Rotary Switch

Number of alarm cycles = Switch Setting x 10

Modules Rotary Switch

Number of AVM's = Switch Setting x 1

AVM Piezo Sound Pressure Level

90db, on an A-weighted ANSI Type 2 sound level meter at 2 feet (0.61m) on axis in free field), for each piezo alarm.

Dimensions

Controller – 75H x 100W x 110D mm
Audio Visual Module – 61.5H x 90W x 45D mm
Power Supply – 75H x 55W x 110D mm

5. Equipment List

118803	PSW Controller
118812	PSW Audio Visual Module
118833	PSW 110VAC/20-0-20VAC Power Supply
118834	PSW 240VAC/20-0-20VAC Power Supply

Typical Circuit