OPERATIONAL TESTING PROCEDURE

The test procedures described herein pre-suppose earlier comprehensive factory acceptance testing of the individual system components and these procedures, while proving basic operation, will essentially prove the correct integration of these alarms components and associated interconnections.

The importance of these tests can not be over stressed since, unless these are completed successfully, there is no evidence that the individual components will operate as a system to meet the essential alarms functionality as intended.

All peripheral device connections to the KLIO are indicated on the Connection Diagram KLIO-3..5/aaa/bb/cc and these should be completed prior to testing. With reference to this Connection Diagram, interconnecting Cable 13.xx details and the associate Station Alarms Panel documentation, confirm that all components meet the user specification. For direct plug-in compatibility with the related Vega Station Alarm panel, confirm that Vega SAP is supplied appropriately configured.

Navigation warning light fault sensing is based upon the current sensing principle and full performance is not achievable in cases where interior pole lights are operated off the navigation warning light circuit.

Visual Installation Check Points

A.1 Confirm correct physical placement of the KLIO rail mount enclosures in the AC Distribution Board with reference to the data pack particular to the type of installation and verify correct labelling.

A.2 Do a critical visual inspection of all the wiring connections considering polarisation of plug connections and integrity of screw terminal connections. Refer to the data pack where necessary.

A.3 Verify correctness and security of direct plug-in or IDF block type connections of alarms outputs to the Vega SAP or similar at the remote end.

A.5 No earthing connection is required to the KLIO.

A.6 Verify that a complete set of KLIO system documentation is included in the shelter / site file records.

Operational Tests

This procedure applies to the full range of functionality available on the KLIO, all of which will not necessarily be supplied into all markets.

Since this in situ test will lead to intermittent generation of alarms, arrangements need to be in place to be in system test mode where the alarms could possibly be received to prevent possible confusion at the receiving end.

B.1 Establish communication with the (local or remote) network supervisory function to be able to confirm each alarm function status indication at the receiving end. In the absence of such a facility the alarm outputs from the KLIO can be confirmed locally by means of simple continuity testing or by way of a custom digital alarms test unit. Always observe CE (Collector/Emitter) polarity on the alarm outputs when testing. (Refer documentation.)

B.2 Individual alarms are to be confirmed on a one-by-one basis by way of simulating the failure conditions that will lead to an alarm indication for verification:

B.2.1 Mains AC Power Fail Alarms

Separate alarm outputs are generated respectively indicating an all phases not present condition and any single phase not present. By manipulation of the three phase supply to the AC DB both these conditions should be simulated in turn. The three phase L1, L2 and L3 annunciation on the KLIO should throughout this test sequence reflect the AC power supply manipulation accordingly while correct indication of the corresponding alarm condition to the supervisory system is confirmed. (Also refer to paragraph B.2.4 below). Both these AC mains fail alarms are normally closed by default;

B.2.2 Navigation Warning Light Fail Alarm

Navigation warning light failure monitoring by the KLIO is designed to provide alarm indication of first lamp failure. To achieve this level of performance requires correct calibration of the unit. When user warning light configuration information is available at the time of supply, the KLIO is factory calibrated for the application. In the absence of such calibration information or when the warning light configuration should change, re-calibration is required in order to achieve optimum performance. (Refer paragraph C below.) An all lamp or entire warning light circuit failure condition will register an alarm condition independent of the above calibration set point.

With reference to the application table on Connection Diagram KLIO-3..5aaa/bb/cc, confirm that the correct KLIO model number has been selected and supplied for the intended application.

SAFETY WARNING!! Special care should be taken to ensure that the total wattage of the installed lamps in a particular warning light installation falls within the application specification for the KLIO. Should a discrepancy be found, refer to Tautech for advice or correction as required.

See qualification on internal pole lights operated off navigation warning light circuit.

Test operation of this functionality by powering up the warning light installation and after confirmation that all lamps in the system are ON, the alarm condition is annunciated healthy (ON) on the KLIO and also that a corresponding condition to the supervisory system is confirmed. To prove correct indication of a warning light fail condition, one lamp or cluster has to be temporarily disconnected or taken out of circuit in the most convenient way and the corresponding (fail) annunciation plus an alarm output condition confirmed. The navigation warning light fail alarm is normally closed by default. Should the desired result not be achieved refer to paragraph C below.

B.2.3 User Alarm Inputs

The KLIO allows the user the option of collecting up to two alarm channels other than the above pre-defined conditions. These would be alarms originating in the AC distribution board or outside the shelter from where it could conveniently be cabled to the AC distribution board.

Generate each of the User Input U1 and U2 alarms in turn and confirm correct indication to the supervisory system. Both the U1 and U2 alarms transfer normally open or normally closed conditions however driven externally.

B.2.4 Voltage Condition Monitoring

In order to enhance AC Power Monitoring functionality beyond the presence sensing operation of the standard KLIO, provision is made for an external input to the KLIO from a dedicated voltage condition monitoring device that could then be set to specific over and under voltage margins to indicate non-conformance. When this option is used, indication of an out-of- limits voltage condition is indicated on the same KLIO alarm channel that would, in the basic configuration, indicate any single phase not present while relying on annunciation from the monitoring device in this case.

Test operation of this functionality by simulation of an out-of-limits mains AC voltage condition and confirm corresponding indication to the supervisory system when active. The voltage out-of-limits alarm remains normally closed by default as for indicating single phase not present.

B.2.5 Air-conditioning Unit Shut-off

When the KLIO is complemented with the above optional mains condition monitoring device the further option that becomes available is to, in addition to having out-of-limits voltage alarm indication, also feed the repeat output of this condition from the KLIO to the ACCU. When this is integrated to an ACCU with AC Switching Block of compatible Version, air-conditioning unit operation is interrupted when the mains AC supply voltage level is outside of the set margins.

Test operation of this functionality by, while simulating the out-of-limits voltage condition above, also confirm that air-conditioning operation is interrupted.

Calibration of Navigation Warning Light Alarm

Should the factory calibration of the navigation warning light alarm not provide satisfactory results, the following procedure should be followed to calibrate the warning light alarm function in the specific application. It is important that, should the internal fuse of the KLIO interrupt the Warning Light current, a clear understanding of the cause be formulated prior to replacing the fuse.

SAFETY WARNING!! Only if and when safe to do so, should the fuse element be replaced and then only with a unit of the rating as indicated. Provided that these requirements are adhered to the KLIO will monitor accurately and reliably.

Calibration is achieved by way of the multi-turn adjustable resistor identified for this purpose. The principle is to find the point of adjustment where, with all the warning light lamps ON, a healthy condition will be indicated and where, with some of the warning light lamps OFF, the appropriate alarm condition is indicated in turn. For correct operation the following simple procedure should be followed:

C.1 With all the warning light lamps ON, adjust clockwise for healthy(ON) or counter-clockwise for alarm(OFF) annunciation on the face plate of the KLIO;

C.2 At the point of transition, continue to make two more complete clockwise turns on the adjustment. The purpose of this is to create a positive discriminating margin;

C.3 Now prove correct detection of a fail condition by disconnecting one lamp or cluster to confirm corresponding indication from the KLIO;

Should satisfactory results not be obtained, contact Tautech for support.

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Test Equipment

The following test equipment and conditions are required to perform the above Operational Testing:

D.1 AC power supply to the site complete and energized;

D.2 When applicable, the navigation warning light installation complete and all connections complete with lamps fitted;

Since commissioning testing or calibration of the navigation warning light installation requires a lamp or cluster to be temporarily disconnected or switched off to represent a failed condition, a testing loom representative of the actual warning light installation could be used when physical constraints limits access to the tower;

D.3 When the alternative User Input U1 and U2 functionality is used, the actual input devices that will drive these alarm inputs and wiring to these complete;

D.4 When the Voltage Condition Monitoring and/or Air-conditioning Unit Shutt-off (RO) functionality is used, also DC power installation complete and auxiliary DC supply to the alarms connected or alternatively temporary 12 / 24 / 48V DC source (refer specific model of KLIO for correct supply voltage level) of approximately 100mA capacity;

D.5 Multi-meter type continuity tester;

D.6 Comprehensive documentation.

End