Austin

Installation Instructions for

AUSTIN ISOLATION TRANSFORMER

(SINGLE WINDING SERIES)

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Austin Isolation/Lighting Transformers

(Single Winding Series)

PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLING THIS ISOLATION/LIGHTING TRANSFORMER, WHETHER ON A NEW INSTALLATION OR AS A REPLACEMENT UNIT.

General Description

Transformer Type	Capacity (kVA)	Nominal Primary/ Secondary Voltage	R.F. Flashover Dry - Sea Level
A-07S1	0.7	115/115	65 kV peak
A-07S2	0.7	230/230	65 kV peak
A-17S1	1.7	115/115	65 kV peak
A-17S2	1.7	230/230	65 kV peak
A-25S1	2.5	115/115	100 kV peak
A-25S2	2.5	230/230	100 kV peak
A-35S1	3.5	115/115	85 kV peak
A-35S2	3.5	230/230	85 kV peak
A-50S1	5.0	115/115	100 kV peak
A-50S2	5.0	230/230	100 kV peak

The transformers listed above are intended for use on radio masts and towers with moderate RF potentials across the base insulator. When installed in the open, the permissible RF potential between primary and secondary rings will be considerably less than the dry flashover figures given above. For operation under wet, dusty, or insect infested conditions, the maximum permissible voltage will depend on the amount of rain, etc., the frequency of occurrence and the acceptability of occasional arc-overs and level of drip corona. Under heavy rain conditions, excessive drip corona will probably occur before arc-over. It is unlikely that satisfactory operation will be achieved above the following levels of RF voltage:

A-07S1 and A-07S2	-	22 kV peak
A-17S1 and A-17S2	-	22 kV peak
A-25S1 and A-25S2	-	52 kV peak
A-35S1 and A-35S2	-	34 kV peak
A-50S1 and A-50S2	-	52 kV peak

CAUTION

1. Ensure that the tower or mast is grounded.
2. Check that the mast lighting circuit is not faulty.
3. Ensure that the primary power wires are not “live”.
4. Ensure that the primary protective circuit is in accordance with the recommendations made below.

Primary Protective Circuit

A circuit breaker is not recommended unless it has been chosen to have the required delayed action to withstand the inrush current to cold lamp filaments. A fuse will provide ideal protection and has an inherent thermal delay which will take care of the inrush current at the time the system is switched on.

Whether a fuse or a circuit breaker is chosen, its operating current should be approximately 20% above the normal operating current for the lamp load in use.

Transformers are sometimes damaged because insufficient care was taken in choosing the primary protective circuit. Though there is appreciable flux leakage resulting from the open nature of the primary and secondary windings, the efficiency and regulation of the transformer is such that windings are in danger of being over-heated and damaged if the full load rating is exceeded by more than a few precent for any appreciable length of time. Safe operation is assured if the primary current is measured under normal load conditions and a fuse chosen with a rating approximately 20% above this operating current.

Installation - Mounting

WARNING:

DO NOT ATTEMPT TO TURN OR ADJUST ANY PIPE FITTINGS BELOW THE UNION ON THE SECONDARY OF THE TRANSFORMER. ANY MOVEMENT OF THE FITTINGS BELOW THE UNION WILL BREAK THE WATERPROOF SEAL AND WATER WILL ENTER AND SHORT THE SECONDARY. ANY ADJUSTMENT NECESSARY MUST BE MADE USING THE SECONDARY UNION.

The A-07S1 to A-35S2 range of transformers are shipped in triwall cartons, while the A-25S1, A-25S2, A-50S1, and A-50S2 are shipped in wooden crates. When removing the transformer from its crate or carton, do not attempt to lift it out with the secondary coil - as damage to the secondary shield may occur. Instead, both the primary and the secondary coils should be supported.

Mount the primary and secondary rings by screwing the unions onto suitable support pipes arranged so that when the unions are tightened, the rings are centred one with the other. The following sizes of pipe unions are used:

A-07S1 and A-07S2	-	*1" NPT*
A-17S1 and A-17S2	-	*1" NPT*
A-25S1 and A-25S2	-	*1½" NPT*
A-35S1 and A-35S2	-	*1½" NPT*
A-50S1 and A-50S2	-	*1½" NPT*

Install the lightning gap as shown in the profile sketch, ensuring that the arm attached to the secondary ring has the sphere with a drain hole. The gap is adjusted by movement of the primary arm through rotation of the street elbow supports which should be screwed firmly enough in place to prevent accidental movement in the arm, but not so tightly that further movement cannot be made if required for gap adjustment. A very approximate indication of the variation of flashover voltage with gap setting is given below:

Gap Setting	Gap - Dry Flashover kV peak at 100 kHz	Gap - Wet Flashover kV peak at 100 kHz
½"	38	18
1"	68	29
1½"	88	38

Installation - Bonding

Two bonding braids are provided on the primary assembly and two on the secondary assembly. The primary bonding leads, on of which is attached to the Lightning Gap Arm and the other to the Transformer mounting clamp and core, should be connected with a good mechanical and electrical bond to the antenna ground system. The secondary bonding braids, one of which is connected to the Lightning Gap Arm and the other to the secondary shield, should be mechanically and electrically securely connected to the tower or mast. Bonding connections should be made as short and direct as possible after allowing any necessary slack for mounting adjustments. Any surplus length of braid should be cut off.

Installation - Wiring

It is necessary to ensure that no substantial radio frequency potential exists between the secondary winding and its outer shield or between the primary winding and its core. If the mast lighting circuit is run continuously in metal conduit well bonded to the mast, this will generally be satisfactory. If the primary power is brought to the transformer from the transmitter building in conduit or metallic covered cable which is bonded to the antenna ground system, this too should be adequate protection against stray RF pickup.

If the above conditions are not met, then it is desirable at the transformer primary and secondary connections to provide RF bypassing by installing good quality mica capacitors of 0.01 µF minimum from each line to ground. These capacitors should have a minimum DC working voltage range of 600 V for 115/230 volt circuits and 1200 V for 230/460 volt circuits.

Installation - Secondary Connections

Transformers of the S1 or S2 type, have only one secondary winding.

All secondary connections should be well insulated with approved connectors or electrical tape.

Installation - Primary Connections

Taps have been provided on the primaries to permit a range of voltage adjustments. The two line wires are connected such that one line is connected to either primary wire number BK1 or R2 and the other line to transformer primary wire number Y3 or G4.

All unused wires and all connections should be well insulated with approved connectors or electrical tape.

Maintenance

A can of grey alkyd enamel is enclosed which can be used for touch-up purposes on completion of the installation. The transformer assembly should be painted with this, or a similar enamel every two or three years to maintain the resistance to moisture. No further maintenance is required beyond repairing any obvious mechanical damage that might have occurred.

Note: Transformers now use colour leads instead of number coding. The following chart shows equivalent colour to number.

Black	-	#1
Red	-	#2
Yellow	-	#3
Green	-	#4
Blue	-	#5
White	-	#6

Encl: Profile Sketch of a Single Winding Series Transformer
Wiring Diagram for Transformer Secondary
Wiring Diagram for Transformer Primary

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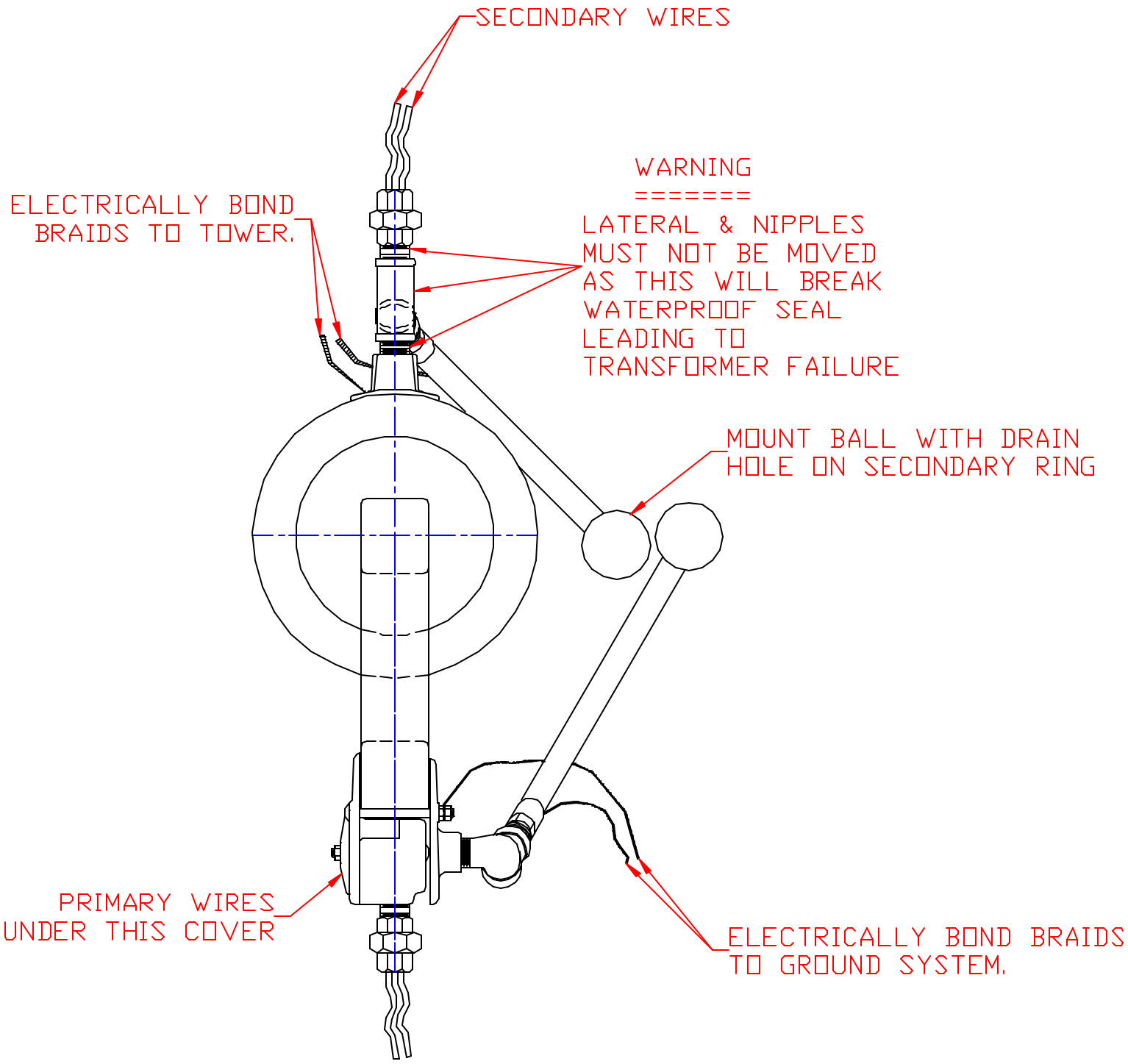
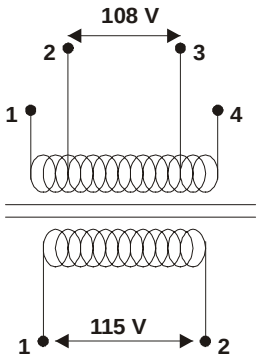

SECONDARY WIRES
WARNING
=======
LATERAL & NIPPLES
MUST NOT BE MOVED
AS THIS WILL BREAK
WATERPROOF SEAL
LEADING TO
TRANSFORMER FAILURE
ELECTRICALLY BOND
BRAIDS TO TOWER.
MOUNT BALL WITH DRAIN
HOLE ON SECONDARY RING
PRIMARY WIRES
UNDER THIS COVER
ELECTRICALLY BOND BRAIDS
TO GROUND SYSTEM.

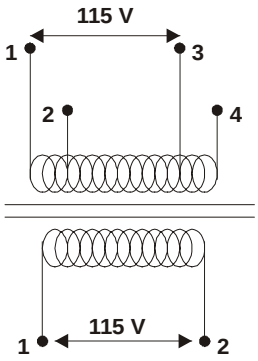
Austin Isolation/Lighting Transformers
(Single Winding Series)

Full Load Voltage Ratio Diagrams for S1 type Transformer:
(A-07S1, A-17S1, A-35S1, A-50S1, and A-25S1)

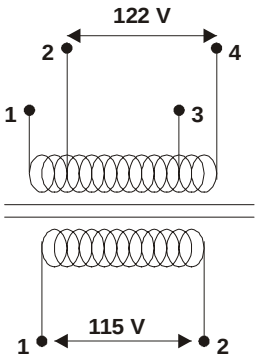
108 LINE VOLTAGE CONNECTIONS



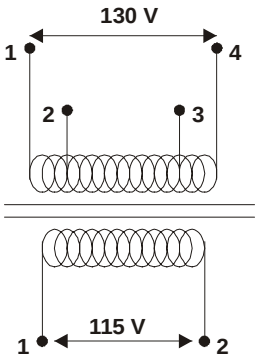
115 LINE VOLTAGE CONNECTIONS



122 LINE VOLTAGE CONNECTIONS

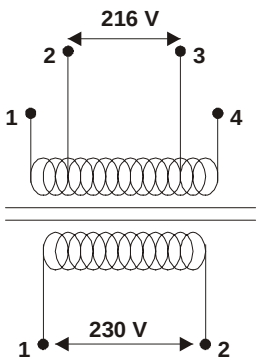


130 LINE VOLTAGE CONNECTIONS

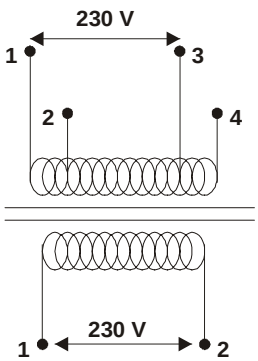


Full Load Voltage Ratio Diagrams for S2 type Transformer:
(A-07S2, A-17S2, A-35S2, A-50S2, and A-25S2)

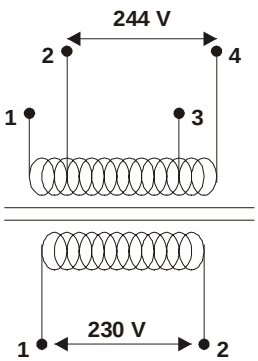
216 LINE VOLTAGE CONNECTIONS



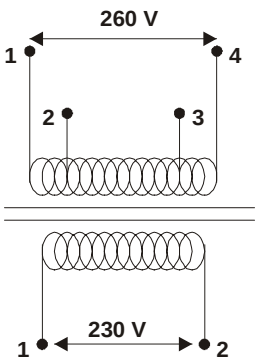
230 LINE VOLTAGE CONNECTIONS



244 LINE VOLTAGE CONNECTIONS



260 LINE VOLTAGE CONNECTIONS



Wire Colour/Numbering Code

Black	-	#1
Red	-	#2
Yellow	-	#3
Green	-	#4
Blue	-	#5
White	-	#6