



IBS 870

BYPASS ISOLATION SWITCHES

INSTALLATION, OPERATING & SERVICE MANUAL



PM050 Rev 6 01/10/17

1. PRODUCT REVISION HISTORY

The following information provides an historical summary of changes made to this product since the original release.

Rev 6 01/10/17	Withstand rating change for 100A & 150A.
Rev 5 01/07/20	New IBS 870-TS7-1000/1200 model introduced; ground fault test requirements; performance tests.
Rev 4 00/12/01	New IBS 870-TCK-600 model introduced; cable terminal information; DSS option Lev-3 information available in PM043.
Rev 3 00/03/01	Warnings added with reference to multi-tap controller capability features and system voltage.
Rev 2 00/01/21	Added 200A model information c/w drawings.
Rev 1 97/08/01	Minor text changes
Rev 0 97/07/10	Original release.

Contact Thomson Technology Inc., to obtain applicable instruction manuals. Soft copy of most current version is available at www.thomsontechnology.com.

NOTE: All information contained in this manual is for reference only and is subject to change without notice.

2. GENERAL DESCRIPTION

Bypass Isolation switches are used in conjunction with automatic load transfer switches. They enable an operator to bypass a source to the load and isolate the transfer switch for maintenance or testing.

The mechanism utilizes molded case switching devices and a positive mechanical interlock to prevent two sources from being connected at the same time and true isolation of the transfer switch.

3. DOUBLE SIDED BYPASS (MODEL IBS 870)

This device allows bypass to either source and complete isolation of the transfer switch. The bypass consists of two source isolate breakers, two source bypass breakers (both utility and generator sides) and a load isolate breaker. This switch provides for an interrupted bypass only to either source. A test circuit allows for transfer switch operation in the bypassed mode.

CAUTION: Before opening the transfer switch or bypass isolation switch enclosure to perform any service task or to manually transfer the mechanism, it is imperative to isolate the transfer switch from any possible source of power. Failure to do so may result in serious personal injury or death due to electrical shock.

4. NOTE TO INSTALLER

To ensure satisfactory installation of this equipment be sure to observe "Recommended Connection Tightness" and "Requirements for Upstream Circuit Protective Devices" located in this manual.

All mechanical and electrical connections must be checked for tightness prior to placing this equipment in service to ensure proper operation and to validate applicable warranty coverage.

If the transfer switch has programmable multi-tap voltage capability (refer to electrical schematic), confirm the transfer switch has been configured for the system voltage prior to installation.

Warning

Failure to confirm and match transfer switch voltage with the system voltage could cause serious equipment damage.

The voltage selections and connections are shown on the electrical schematics attached to each transfer switch. The factory default settings will be indicated on the calibration label attached on the inside of the enclosure door (supplied loose on open style models). A blank label is included to record the applicable settings if the configuration is changed from the factory default settings.

To change the transfer switch configuration the following must be accomplished:

- Change voltage taps of PT's to system voltage (refer to schematics)

- Change TSC 800 programming (refer to sections 6.2.2, 6.2.4, 6.2.5, 6.3, and 6.4 of the TSC 800 instruction manual). The following settings may require reprogramming (depending on options purchased):
 - System voltage
 - System frequency
 - System phase
 - Utility undervoltage pickup (typically 90% of system voltage)
 - Utility undervoltage dropout (typically 80% of system voltage)
 - Utility overvoltage pickup (typically 110% of system voltage)
 - Utility overvoltage dropout (typically 105% of system voltage)
 - Utility underfrequency (typically 95% of system frequency)
 - Utility overfrequency (typically 105% of system frequency)
 - Generator undervoltage pickup (typically 90% of system voltage)
 - Generator undervoltage dropout (typically 80% of system voltage)
 - Generator overvoltage pickup (typically 110% of system voltage)
 - Generator overvoltage dropout (typically 105% of system voltage)
 - Generator underfrequency (typically 95% of system frequency)
 - Generator overfrequency (typically 105% of system frequency)

Record any changed setting on the TSC 800 Programming Data Sheets for future reference. Complete the blank calibration label and attach to the inside of the transfer switch enclosure door.

5. GENERAL NOTES ON SERVICING

When performing any service work on the bypass isolation switch, it is imperative that the following be observed:

- a) To maintain mechanical integrity, ensure that:
 - Mechanical interlocking is correct and movement is free; proper sequence of breaker opening/closing must be maintained.
 - All fasteners are adequately tightened.

- b) To maintain electrical integrity, ensure that:
 - All electrical connections are clean and adequately tightened.

- All insulating devices are in place and in good condition.
- No moisture or other contamination is present.

Service work should be undertaken only by qualified personnel. Failure to correctly maintain a bypass isolation switch may represent a hazard to life and equipment. Full operational testing must be done prior to placing a switch in service subsequent to any maintenance or repair. Any service work involving electrical components requires high potential testing to ensure that required insulation levels have been maintained.

6. OPERATION

(Refer to the operating description for the model and type of equipment installed).

NOTE: a) In this manual, the breakers are designated as follows:

- | | |
|------------------------------|--|
| NI-Normal (Utility) isolate: | This breaker isolates the utility supply input from the transfer switch. |
| GI-Generator isolate: | This breaker isolates the generator supply input from the transfer switch. |
| LI-Load isolate: | This breaker isolates the load from the transfer switch. |
| NB-Normal (Utility) bypass: | This breaker connects the utility supply directly to the load. |
| GB-Generator bypass: | This breaker connects the generator supply directly to the load. |

- b) Normal position is defined as when neither source is bypassed and the load is being supplied from either source through the transfer switch.

The sequence of operation is as follows:

6.1. Utility Bypass

- Normal position: Isolation breakers operating handle in closed position (NI, GI, LI closed); the interlock key is captivated by isolation handle interlock (plunger retracted); Normal bypass (NB) and Generator bypass (GB) are held open by their respective key interlock plungers.
- Before bypassing, turn engine control switch to OFF if start is not desired.

- To bypass and isolate transfer switch: Move isolation operating handle to open position.
- Turn the interlock key to extend the plunger and remove key.
- Insert the key into the Normal bypass (NB) interlock and turn to retract plunger.
- Close Normal bypass (NB). The transfer switch is now isolated from both source and the load. The load is now connected directly to the utility supply.
- To return to normal position, reverse the above steps.

6.2. Generator Bypass

NOTE: Generator should be running and connected to the load through the transfer switch.

- Normal position: Isolation breakers operating handle in closed position (NI, LI, GI closed); the interlock key is captivated by the isolation handle interlock (plunger retracted); Normal bypass (NB) and Generator bypass (GB) are held open by their respective key interlock plungers.
- To bypass and isolate transfer switch: Move isolate handle to open position.
- Turn the interlock key to extend the plunger and remove key.
- Insert the key into the Generator bypass (GB) interlock and turn to retract plunger.
- Close Generator bypass (GB). The transfer switch is now isolated from both sources and the load. The load is now connected directly to the generator supply.
- To return to normal position, reverse the above steps.

Note: The transfer switch may be tested in the bypassed mode by connecting the transfer to the test plug. This allows for energization of the control circuits **only** for transfer switch function or maintenance testing. **The neutral delay control feature of the transfer switch (if supplied) will not be functional while using the test plug.**

7. RECOMMENDED MAINTENANCE

- 7.1. Do not perform dielectric tests on the equipment with any control components in the circuit.
- 7.2. Periodically inspect all terminals (load, line) for tightness. Re-torque all bolts, nuts and other hardware.
- 7.3. Bypass isolation switches should be in a clean, dry and indoor location. If signs of moisture are present, attempt to remove. If cleaning is unsuitable, replace the corroded parts. Should dust or debris gather on the switch, brush, vacuum or wipe clean. **DO NOT** blow dirt into breakers or terminals.
- 7.4. Check for ease and correctness of interlock movement.

8. DEFECTIVE COMPONENTS

Return defective components to Thomson Technology Inc. for repair. Be sure to advise model and serial number of the unit.

9. CABLE TERMINAL INFORMATION AND RECOMMENDED TIGHTNESS

		Cable Terminal Rating				Connection Tightness (In-Lbs)	
Basic Transfer Switch Style	Transfer Switch Rating (Amps)	Utility & Generator Supply		Load & Neutral		Terminal Mounting Screw	Cable Clamp
		Qty Per Phase	Range	Qty Per Phase	Range		
MCE	100 150	1 1	#4-4/0 #4-4/0	1 1	#4-4/0 #4-4/0	-- 20	100 (Socket) 50 (Slot)
MS3	200	1	#6-350MCM	1	#6-350MCM	72	275
MCE	250	1	#1-350MCM	1	#1-350MCM	90	275
TCJ	400 ¹	3	250-500MCM ³	2	2/0-500MCM 4/0-500MCM	275	375
TCK	600 ¹	3	250-500MCM ³	2	2/0-500MCM 4/0-500MCM	275	375
TCK	800 ¹	3	250-600 MCM	3	250-600 MCM	275	375
TS7	1000/1200 ¹	4	4/0-500MCM	4	4/0-500MCM	375	375
TCK	1600 ²	4	#2-600MCM	4	#2-600MCM	275	375

1. Optional Terminal Ratings are available in some models – Consult TTI.
2. IEC only.
3. 600MCM lug size is available subject to restricted cable entry locations.

10. REQUIREMENTS FOR UPSTREAM CIRCUIT PROTECTIVE DEVICES

Closing and Withstand Rating (Amps RMS Sym) With Upstream Fuse Protection

Basic Model	Max. Voltage	Rated Current (A)	SHORT CIRCUIT CURRENT RATING (AVAILABLE SYMMETRICAL AMPS (RMS)) ₁				
			With Upstream Circuit Breaker Protection			With Upstream Fuse Protection	
			@240V	@480V	@600V	@ Up to 600V	Fuse Type
IBS 870 - MCE-100	600	100	65,000	35,000	25,000	100,000	T, J
IBS 870 - MCE-150	600	150	65,000	35,000	25,000	100,000	T, J
IBS 870 - MS3-200	240	200	100,000	N/A	N/A	N/A	T, J
IBS 870 - MCJL-250	600	250	65,000	35,000	25,000	100,000	T, J
IBS 870 - TCJ-400	600	400	65,000	35,000	25,000	100,000	T, J
IBS 870 - TCJ-600	600	600	65,000	50,000	35,000	100,000	T, J
IBS 870 - TCK-800	600	800	65,000	50,000	35,000	100,000	Consult Factory
IBS 870 – TS7-1000	600	1000	65,000	50,000	50,000	100,000	“
IBS 870 – TS7-1200	600	1200	65,000	50,000	50,000	100,000	“

1. Standard ratings only are shown. Consult TTI for versions with higher short circuit current ratings.

Fuse ratings shown are maximum allowable to permit use of the transfer switch in application with available fault current not exceeding that shown. Consideration must be given to fuse sizing when fuses also provide overload protection.

Please refer to the factory for further information on upstream protection requirements, if required.