

# marathon™ Thomson Power Systems

Series TS 870 • 100 - 1200 Amp  
Bypass Isolation Transfer Switches



THOMSON

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POWER SYSTEMS  
ISO 9001

A Regal Brand

**REGAL**

## OUTSTANDING FEATURES

### Enclosed Contact Power Switching Units

- **Fully enclosed** silver alloy contacts provide **high withstand rating & 100% continuous** current rating.
- Barriers between the transfer switch and bypass isolation switch reduce the chance of consequential damage if there is a failure in either the transfer switch or bypass isolation switch.
- When isolated there is no power in the transfer switch compartment **providing true isolation**.
- **Not damaged if manually switched** while in service since contacts have inherent spring over center design.

### Reliable Motor-Operated Transfer Mechanism

- **Heavy duty** brushless gearmotor and operating mechanism provide mechanical interlocking and extreme long life with minimal maintenance.
- **Safe manual operation** permits easy operation even under adverse conditions.
- All control wires and power busses are **front-accessible**, eliminating the cost and complexity of a drawout transfer switch.

### Control Features

- **TS 900** microprocessor based controller with 7" color touch screen graphical display and programmable outputs.
- **Isolation plug** permits disconnecting control circuits from all power sources for safety and convenience.

- Control circuitry permits complete **off load testing** of the transfer switch when isolated (a drawout transfer switch is not required.)

### Isolation Switch

- Allows bypass without load interruption (double sided bypass only).

### Quality Assurance

- ISO 9001:2000 Registered

### Product Data

- Models from 100-1200 Amp continuous
- Available 3 or 4 pole
- All models 50/60Hz rated
- Voltage range 208-600V
- 3 phase, 3 or 4 wire systems

### Safety Standards

- CSA C22.2 No. 178/CSA C22.2 No. 31 (in accordance with **CSA 282-00** - Institutional & Residential Buildings Occupancy Group B and C)
- Seismic Certification – IBC 2405 - Section 13, Occupancy Category IV. ASCE7-OS Region 3 (minimum SS = 342%)

## GENERAL DESCRIPTION

The **Thomson Power Systems TS 870** bypass isolation transfer switch includes all the features of the **TS 870** transfer switch described in our **TS 870** Automatic Transfer Switch brochure.

The **TS 870** bypass isolation switch incorporates two basic types for bypass-isolation. **Type "B" (double-sided)** isolates the transfer switch and can bypass either the utility or generator source of the load, as selected by the operator. Single-sided bypass **types "D" (utility bypass) and "C" (generator bypass)** can bypass only one source to the load (in accordance with **CSA 282-00** - Institutional & Residential Buildings Occupancy Group B and C). Note: CSA 282-00 requires (as a minimum) a single sided bypass on the generator supply.

The **TS 870** series mechanisms utilize enclosed contact power switching units which provide a **100% continuous rating**. The switches are mounted independently on a common frame.

**Independent switching** units provide a degree of reliability and redundancy not available with ganged contactor type bypass systems.

Each switching unit is equipped with an **internal quick-make, quick-break mechanism** as standard, and is **certified to switch without de-energizing any system loads**.

The **single handle bypass mechanism** is permanently mounted, and will not permit the sources to be interconnected. An operator has **three simple steps** to follow when bypassing, for servicing procedures or in cases when there is a transfer switch failure and manual transferring is required. The unique **single handle bypass design** allows bypassing with or without a load interruption (double-sided bypass only). Bypass and isolation position indication is permanently mounted at each switch position allowing the operator to clearly identify which mode the system is in (illuminated position indication is available as an option).

## STANDARD FEATURES

- 7" color touch screen graphical display for monitoring 3 Phase Utility/Generator voltage, system frequency and timer countdown operation
- Front Panel Programming using touchscreen graphical display with password security
- Load on Utility & Load on Generator indication
- Utility & Generator Source available indication
- 3 Phase Voltage sensing on Utility & Generator Sources
- Generator AC frequency sensing
- Utility under voltage control setpoint 70 - 95% (adjustable)
- Generator under voltage control setpoint 70 - 95% (adjustable)
- Generator under frequency control setpoint 70 - 90% (adjustable)
- Engine warm-up timer 0-60 sec. (adjustable)
- Utility return timer 0-30 min. (adjustable)
- Engine start timer 0-60 sec. (adjustable)
- Engine cooldown timer 0-30 min. (adjustable)
- Neutral position delay timer 0-60 sec. (adjustable)
- Load Disconnect Contact (LDC) for pre/post transfer control to signal external building systems such as elevators during transfer operations
- Programmable Generator Exercise Timer (EXT) with easy to use event, Calendar Based, On-load or Off-load Programmability
- Real-time clock c/w battery back-up & daylight-savings programming
- Data logging including total transfers to generator, total utility power failures, load on utility hours, load on generator hours and utility or generator voltage/frequency data at time of fault
- Eight user Programmable Output Contacts rated 2A, 120/240V resistive, Form C. Each output contact is user programmable to 20 different functions including: Load on Utility, Load on Gen, Load Disconnect Contact (LDC), Fail to Transfer (FTT), Utility Power Available (UPA), Generator Power Available (GPA), Utility Power Fail, Engine start, ATS Not in Auto, and ATS in Auto. The Transfer Switch is pre-programmed with the following outputs enabled:
  - Load on Utility
  - Load on Gen
  - Load Disconnect Contact (LDC)
  - Fail to Transfer (FTT)
  - ATS Not in Auto
- Local utility power fail simulation test



- Remote utility power fail simulation test pushbutton input
- Local plant exercise initiate pushbutton control
- Engine start contact (7A, 120/240VAC resistive max.)
- Transfer fail/forced transfer logic
- Automatic force transfer to alternate supply should load voltage become de-energized
- 50 or 60Hz capable (115V control power)
- Remote Load Test/Peak Shave Input
- NEMA 1 Enclosure
- Solid Neutral on 4 wire Systems
- Auto Configuring System Voltage Type (3 wire delta or 4 wire Wye capable without additional sensing transformers)
- ATS Load Bus Power Metering Capability (Amp, Volt, Freq, kW, kVA, PF)\*
- Under/Over Frequency Protection- Utility and Generator Sources
- 3 Phase Over Voltage Protection - Utility and Generator Sources
- Phase Sequence and Phase Rotation Protection between Utility and Generator Sources
- Voltage Phase Loss/Unbalance Protection
- Programmable Inputs (Quantity 16 Digital Input-voltage free input)
- RS232 Modbus Remote Communication Port (Modbus Serial RTU) via GHC
- Optional Ethernet Modbus™ Remote Communication Port (Modbus™ TCP) via GHC
- USB Communication Port (Quantity 3 via GHC)
- Serviceable Plug-in Connectors
- Event Logging (Time/Date Stamping)

\* Power Metering requires Current Transformer Option Kit

## WITHSTAND CURRENT RATINGS (ALL MODELS)

BASIC MODEL	MAXIMUM VOLTAGE	RATED CURRENT (AMPS)	WITHSTAND CURRENT RATING AMPS (RMS)				
			With Upstream Circuit Breaker Protection			With Upstream Fuse Protection	
			@240V	@480V	@600V	@ up to 600V	FUSE TYPE
TS 87xB - 0100	600	100	65,000	25,000	14,000	100,000	T,J
TS 87xB - 0150	600	150	65,000	25,000	14,000	100,000	T,J
TS 87xB - 0200	240	200	65,000	N/A	N/A	N/A	T,J
TS 87xB - 0250	600	250	65,000	35,000	22,000	100,000	T,J
TS 87xB - 0400	600	400	65,000	35,000	22,000	100,000	T,J
TS 87xB - 0600	600	600	65,000	50,000	35,000	100,000	T,J
TS 87xB - 0800	600	800	65,000	50,000	35,000	100,000	Consult Factory
TS 87xB - 1000	600	1000	65,000	50,000	42,000	100,000	Consult Factory
TS 87xB - 1200	600	1200	65,000	50,000	42,000	100,000	Consult Factory

## ENCLOSURE DIMENSIONS/CABLE TERMINALS (NEMA 1, ASA 61 GRAY)

SINGLE SIDED MODEL	DIMENSIONS (Inches) <sup>1</sup>						SHIPPING WT. (lbs)		TERMINAL RATING <sup>2</sup>	
	HEIGHT		WIDTH		DEPTH				QTY	RANGE <sup>3</sup>
	3 pole	4 pole	3 pole	4 pole	3 pole	4 pole	3 pole	4 pole	PER PHASE	
TS 87xC(D) - 0100	54	54	34	34	16	16	350	355	1	#14 - 1/0
TS 87xC(D) - 0150	54	54	34	34	16	16	350	355	1	#2 - 4/0
TS 87xC(D) - 0200	54	54	34	34	16	16	360	440	1	#6 - 350 MCM
TS 87xC(D) - 0250	54	54	34	34	16	16	400	440	1	#6 - 350 MCM
TS 87xC(D) - 0400	64	84	41	41	15	15	565	610	2	2/0 - 500 MCM
TS 87xC(D) - 0600	64	72	41	66	15	14	590	650	2	2/0 - 500 MCM
TS 87xC(D) - 0800	64	72	41	66	15	14	590	650	3	2/0 - 500 MCM
TS 87xC(D) - 1000/1200	72	72	76	76	17	17	1375	1450	4	4/0 - 500 MCM

DOUBLE SIDED MODEL	DIMENSIONS (Inches) <sup>1</sup>						SHIPPING WT. (lbs)		TERMINAL RATING <sup>2</sup>	
	HEIGHT		WIDTH		DEPTH				QTY	RANGE <sup>3</sup>
	3 pole	4 pole	3 pole	4 pole	3 pole	4 pole	3 pole	4 pole	PER PHASE	
TS 87xB - 0100	54	54	34	34	16	16	370	380	1	#14 - 1/0
TS 87xC(D) - 0150	54	54	34	34	16	16	370	380	1	#2 - 4/0
TS 87xB - 0200	54	54	34	34	16	16	435	655	1	#6 - 350 MCM
TS 87xB - 0250	54	84	34	41	16	15	435	655	1	#6 - 350 MCM
TS 87xB - 0400	64	84	51	41	15	15	655	770	2	2/0 - 500 MCM
TS 87xB - 0600	64	72	51	66	15	14	950	1050	2	2/0 - 500 MCM
TS 87xB - 0800	64	72	51	66	15	14	950	1050	3	2/0 - 500 MCM
TS 87xB - 1000/1200	72	72	76	76	17	17	1375	1475	4	4/0 - 500 MCM

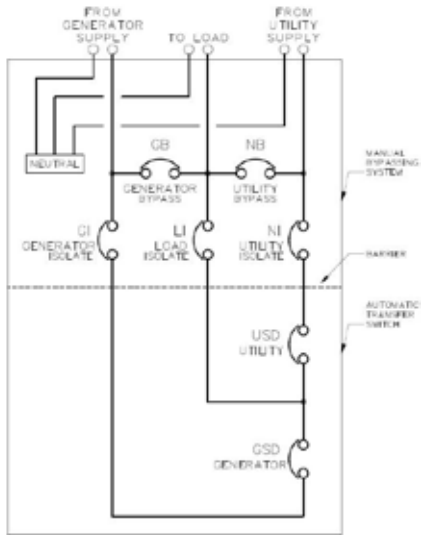
Optional NEMA 2, 3R & 4X (> 600A only) class enclosures available — consult Thomson Power Systems.

<sup>1</sup> Enclosure dimensions are for reference. (DO NOT USE FOR CONSTRUCTION).

<sup>2</sup> Optional Terminal Ratings are available in some models - Consult Thomson Power Systems.

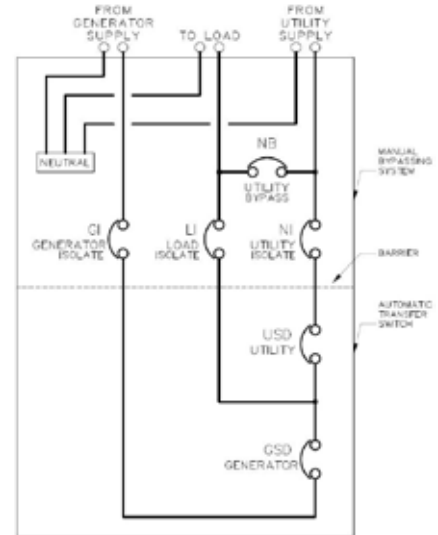
<sup>3</sup> All cable connections suitable for copper or aluminum.

## ONE-LINE SYSTEM DIAGRAM (Typical)



MODEL TS 870 - TYPE "B"

It is not possible to interconnect the utility and generator sources. No voltage is present at the transfer switch while isolated (i.e. isolation switches must all be open)



MODEL TS 870 - TYPE "D"

# ORDERING INFORMATION

## ATS MODEL CODE

Specify the following 21 digit ATS MODEL CODE as per the features and applications described below.

1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
T	S	8	7																	

### 1-3. SERIES

TS – TRANSFER SWITCH

### 4 & 5. MODEL

87 – 870 SWITCH

### 6. POLES

3 – 3 POLE  
4 – 4 POLE

### 7. CONFIGURATION TYPE

B – BYPASS/ISOLATION – DOUBLE SIDED  
C – BYPASS/ISOLATION – GENERATOR SIDE ONLY  
D – BYPASS/ISOLATION – UTILITY SIDE ONLY<sup>1</sup>

### 8-11. AMPERAGE

0100  
0150  
0200  
0250  
0400  
0600  
0800  
1000  
1200

### 12. APPLICATION

A – STANDARD  
X – SPECIAL

### 13. OPERATION TYPE

1 – OPEN TRANSITION  
2 – MANUAL ELEC. OP.  
X – SPECIAL

### 14. SAFETY STANDARDS

C – CSA C22.2. No. 178  
CSA C22.2 No. 31

### 15. VOLTAGE

1Ø 3 WIRE  
D – 120/240

3Ø 4 WIRE (GROUNDED NEUTRAL)

E – 120/208<sup>1</sup>  
F – 127/220  
G – 120/240<sup>1</sup>(DELTA)  
H – 220/380<sup>2</sup>  
J – 240/416  
K – 254/440  
M – 277/480<sup>1</sup>  
N – 347/600<sup>1</sup>

### 3Ø 3 WIRE

P – 208  
Q – 220  
R – 240  
S – 380<sup>2</sup>  
U – 416  
V – 480  
W – 600  
X – SPECIAL

### 16. CONTROLLER

5 – TSC 900 c/w GHC GRAPHIC DISPLAY  
7 – NONE (MANUAL)

### 17. ENCLOSURE TYPE

A – NEMA 1, ASA #61 GREY  
B – NEMA 2, ASA #61 GREY  
C – NEMA 12, ASA #61 GREY  
D – NEMA 3R SD, ASA #61 GREY  
E – NEMA 3R/4 DD, ASA #61 GREY<sup>3</sup>  
F – NEMA 3RX/4X DD (306 STAINLESS STEEL)<sup>3</sup>  
H – NEMA 3RXDD (ALUMINUM), ASA #61 GREY<sup>4</sup>  
X – SPECIAL

### 18. UTILITY SWITCHING DEVICE

K – MOLDED CASE SWITCH 100-1200A

### 19. GENERATOR SWITCHING DEVICE

K – MOLDED CASE SWITCH 100-1200A

### 20. POWER CONNECTIONS

A – STANDARD  
X – SPECIAL

### 21. CONNECTION CONFIGURATION

A – STANDARD  
X – SPECIAL

### NOTES:

- <sup>1</sup> MULTI-VOLTAGE CAPABLE  
<sup>2</sup> FOR 50HZ APPLICATION  
<sup>3</sup> STANDARD ENCLOSURE RATING IS N3R AT 800A AND ABOVE AND N4 AT 600A AND BELOW  
<sup>4</sup> ONLY AVAILABLE 800A AND ABOVE

## OPTIONAL FEATURES

(Specify separately from ATS MODEL CODE when ordering)

### FEATURED CODE:

### FEATURED DESCRIPTION:

#### AUXILIARIES:

AUX-BG	Generator Bypass Auxiliary Contact
AUX-BU	Utility Bypass Auxiliary Contact
KOTS	Key Operated Test Switch- Auto/Off/Engine Start/Test
PPR-10	Programmable Power Relay Includes 10A Form C Contact Wired to Terminal Block (Up to Qty 3)
TS-STG	24Vdc or 120VAC Shunt Trip Generator Switch (external power source required)
TS-STU	24Vdc or 120VAC Shunt Trip Utility Switch (external power source required)

#### COMMUNICATION:

EAP1601	Transfer to Emergency Annunciator, Alarm Horn & Silence Pushbutton
EMB-TCP/IP	Ethernet Modbus™ Remote Communication Port (Modbus™ TCP) via GHC
RS485A	RS 232 to RS 485 Remote Communication Adapter
WF-USB	WIFI USB Stick

#### ENCLOSURE:

GHC-SS	Sunshade for GHC Screen
LCK	Enclosure Lockable Door (Single point T-Handle lock)
TS-H1	Enclosure Strip Heater c/w Thermostat (120VAC external power source required)
TS-H2	Enclosure Strip Heater c/w Thermostat (internally powered from ATS load)

#### FUNCTION:

DS	Dual Source Control Package Dual Utility or Generator
DP	Master/Slave Configuration
MTS	Manually Initiated Electrically Operated Transfer Switch c/w Source Selector Switch, Position Indicating Lights, Source Available Lights
TCP	Transfer Switch Connection Plate for Generator Supply
TS-SS	Internal Multi-Voltage Selector Switch (208V/240V/480V)

#### METERING:

APM	Advanced Power Metering Software (Amps, V, F, kW, kVA, PF, KW/H, Trending). **Requires CT Kit
LPM	Transfer Switch Load Power Metering CT Kit (Amp, Volt, Freq, kW, kVA, PF) **Requires CT Kit
CTK	Current Transformer Kit
MUP	Multifunction Utility Protective Relay – Basler IPS100 (Protection Functions 27, 32, 47, 50/51, 67, 81O/U (Note: May be required by local utility for Soft Load CT applications or even Momentary CT applications. Consult factory for other makes and models.)

#### POWER:

24DCC	24 Volt DC-DC Converter, Regulated
SPD	Surge Protection Device

#### OTHER:

2YR	Additional 12 Month Parts & Labour Warranty
5YR	Additional 48 Month Parts & Labour Warranty

NOTE: Specifications subject to change without notice.

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