Transfer Switches
Magnum-Based Designs

Floor-Standing Magnum Transfer Switches

Floor-Standing Magnum Transfer Switch

General Description

Taylor's Magnum transfer switches are designed for a variety of standby power applications for critical and noncritical loads. They monitor both Source 1 (Normal) and Source 2 (Emergency) power sources. In the event of a Source 1 power interruption, these switches will automatically transfer the load circuits to the Source 2 power source. Once Source 1 power source has been restored, the process is automatically reversed.

Application Description

The Magnum family of transfer switches covers applications ranging from 200 to 5000A through 600 Vac. Some of the applications are: automatic or non-automatic configurations, open or closed transition and standard or rated suitable for use as service entrance. They are designed for applications where total system coordination must be accomplished while achieving a high level of withstand, interrupting and closing performance.

Drawout construction is available for applications, such as critical life-support systems, where preventive maintenance, inspection and testing must be accomplished while maintaining continuity of power to the load.

Features, Benefits and Functions

- Freestanding
- Magnum insulated case devices
- Fastest switching times available (<3 cycles)
- High withstand ratings
- Full 60-cycle short-time withstand capability
- Safe manual transfer under load
- Multi-tap voltage selection plug
- Integral service entrance capability
- Integral overcurrent protection capability
- Drawout capability
- Programmable microprocessor controller with keypad entry and display
- Communications capable
- Durable powder-coated steel enclosures
- UL 489 and UL 1008 listed. 4000 and 5000A available as UL 891 only
- 100 kA standard withstand ratings
- 85 kA, 30 cycle, extended withstand ratings
- Electrically operated
- True four-pole switched neutral availability
- Totally enclosed contact assembly

Note: Stored energy mechanism for manual operation.

Standards and Certifications

Taylor Magnum transfer switches meet or exceed all industry standards for endurance, reliability and performance. They are listed under Underwriters Laboratories UL 1008 Standard for transfer switch equipment. With certain options, they also comply with Source 2 and standby system requirements as defined in NFPA 99 for health care facilities.

- UL 1008—standard for safety for automatic transfer switches 4000 and 5000A available as UL 891 only
- UL 489—standard for circuit breakers and molded case switches
- CSA 22.2-178—Canadian transfer switch standard
- NEC articles—code sections 517, 700, 701, 702—applicable switch equipment
- NFPA 110—Source 2 and Standby Power Systems
- NFPA 99—health care facilities
- EGSA 100S—standard for transfer switches
- NEMA ICS10—Standard for transfer switch equipment
- ISO® 9000—International Organization for Standardization
- IBC—International Building Code 2006
- BOCA—Building Officials Code Administrators

Technical Data and Specifications

Floor-Standing Magnum Transfer Switch

- Ambient temperature range: –40° to 40°C (–40° to 104°F)
- Operating temperature range: –20° to 70°C (–4° to 158°F)
- Operating humidity: up to 90%
- Relative humidity (noncondensing)

Magnum Drawout Transfer Switch

- 200–5000A
- Two-, three-, four-pole (except units 3200A and higher only three- or four-pole)
- 120–600 Vac
- 100,000A withstand/closing/ interrupting at 480 Vac
- Short-time withstand—85,000 for 30 cycles

Magnum Fixed-Mount Transfer Switch

- 200–3200A ①
- Two-, three-, four-pole (except units 3200A and higher only three- and four-pole)
- 120–600 Vac
- 100,000A withstand/closing/ interrupting at 480 Vac
- Short-time withstand–85,000 for 30 cycles

① 4000 and 5000A ratings are drawout.

Transfer Switch Withstand Ratings

Table 25.3-1. Systems Coordination Information—Withstand, Closing and Interrupting Ratings

Rating When Used with Upstream Circuit Breaker		Ratings Used for Coordination with Upstream Breakers with Short-Time Rating
Transfer Switch Ampere Rating	3 Cycle 600V (kA)	30 Cycle 600V (kA)
800	100	85
1000	100	85
1200	100	85
1600	100	85
2000	100	85
2500	100	85
3200	100	85
4000	100	85
5000	100	85

Tested in accordance with UL 1008. Taylor drawout Magnum transfer switch will coordinate with a power switching device short-time rating. Contact factory for details.

Table 25.3-2. Floor-Standing Magnum Transfer Switch Mounting

Mounting Type	Voltage	Current Amperes	Number of Poles	NEMA Enclosure
Fixed Drawout	600 600/347 480 480/277 480/240 415/240 380/220 240 240/120 220 220/127 208/120 120	200 300 400 600 1000 1200 1600 2000 2500 3000 3200 4000 5000	2, 3, 4	Open NEMA 1 behind NEMA 1 thru NEMA 3R

Transfer Switches
Magnum-Based Designs

Floor-Standing Magnum Transfer Switches—General Description

Magnum Drawout Transfer Switch

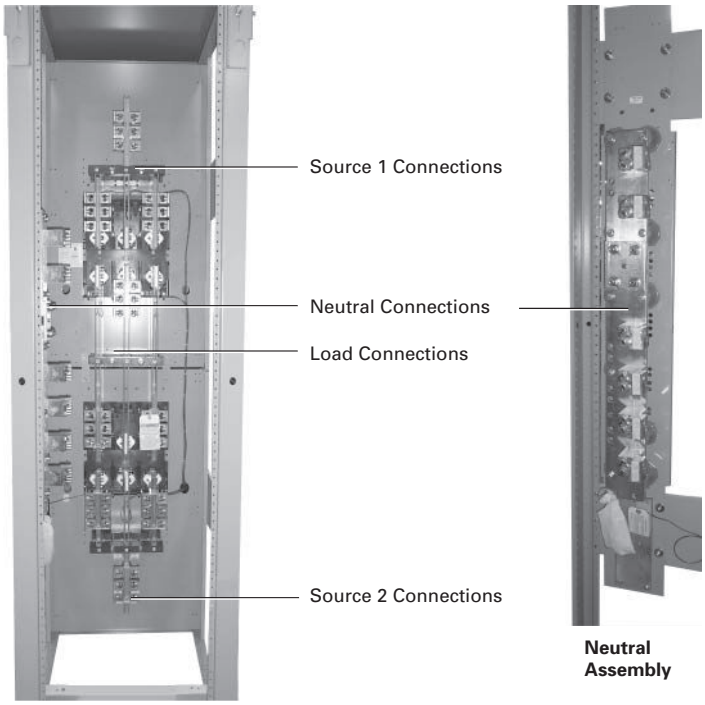
2000A, Four-Pole, NEMA 1 Enclosed, Through-the-Door Design

- Drawout construction with switch position indicator
- Completely interchangeable power switching devices
- Available in NEMA Type 1 and 3R enclosures
- Rear, side and top cable access

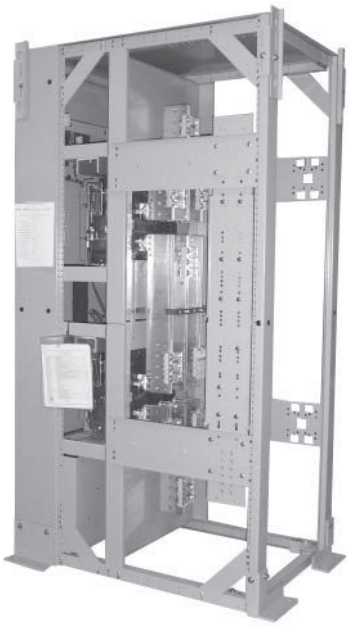
Magnum Fixed-Mount Transfer Switch

2000A, Three-Pole, Fixed Design, NEMA Behind-the-Door Enclosure

- Fixed-mount construction
- Available in NEMA Type 1 and 3R enclosures
- Rear, side and top cable access
- Deadfront construction
- Front access only requires an additional wireway to be added

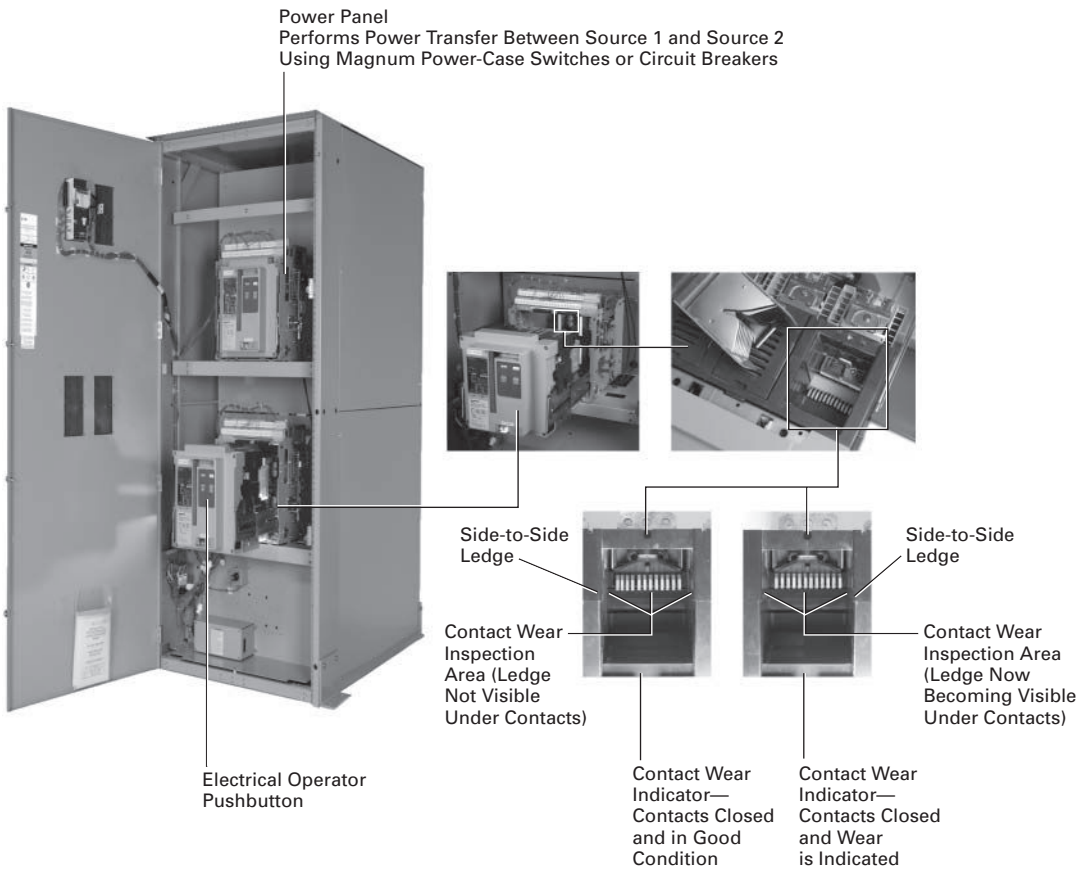


Neutral Assembly



Side View of Magnum Side or Rear Access Required (Half-High Side Panels and Back Panels are Not Shown)

Magnum-Based Transfer Switches



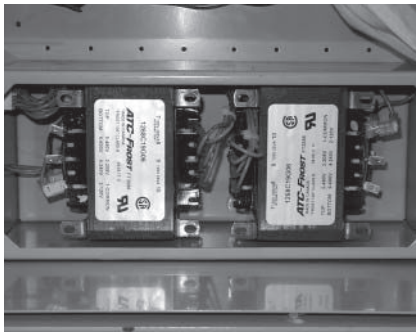
Basic Switch Components of Drawout Magnum Automatic Transfer Switches

The open transition type Magnum Transfer Switches feature both mechanical (cable) and electrical interlocking to prevent paralleling of sources.

Mechanical Cable Interlock

Multi-Tap Voltage Selector

Allows the transfer switch to be readily applied on most system voltages worldwide by connecting to the proper terminals. Available system voltages include 120, 208, 220, 230, 240, 380, 401, 415, 480, or 600 Vac, 50 or 60 Hz.



Voltage Selection Terminals

Ease of Maintenance

Keyed quick-disconnect plugs are provided for easy and complete isolation of the control circuitry.

Maintenance can be performed on the logic independent from the power sections and still allow the user to manually transfer power under full load conditions.

Logic Disconnect Plugs

Logic

Application Versatility

Whether the application calls for open or closed transition, Taylor has the right logic controller for the task. ATC-600/800 controllers have set a new standard for transfer switch technology featuring:

- Microprocessor-based logic
- Digital display
- Field set point programmability
- Transfer history
- PowerNet™ Communications capability
- Voltmeter and frequency meter
- True rms voltage sensing
- Mimic BUS/LED display
- Load voltage decay delayed transition capability
- In-phase monitor capability
- Field upgrade capability

Automatic Transfer Open Transition

Open transition type Magnum transfer switches use the Taylor programmable ATC-600 microprocessor-based logic controller.

Refer to Technical Data TD.15A.05.T.E Open Transition ATC-600 for Automatic Transfer Switches for additional information.

ATC-600

Automatic Transfer Closed Transition

Closed transition applications feature the ATC-800 Closed Transition logic controller.

Refer to Technical Data TD.15A.09.T.E Closed Transition ATC-800 for Automatic Transfer Switches for additional information.

ATC-800 Closed Transition

Unmatched Performance and Versatility

The Taylor family of Magnum transfer switches offers unmatched performance, versatility and value for standby power applications. At the heart of these designs is the Magnum switch with the following features:

Superior Main Contact Structure

All Taylor Magnum transfer switches meet or exceed the standards set forth in UL 1008 and UL 489 with high withstand, totally enclosed Magnum switches. No other transfer switch manufacturer has met the rigid testing requirements of this combination of standards. Completely enclosed contacts add a measure of safety and reliability. They also ensures the integrity of the contact assemblies and minimizes the need for periodic maintenance of the contacts, reducing downtime and maintenance time.

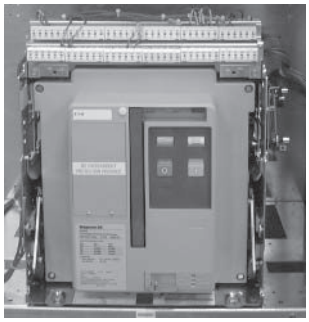
Fast, Powerful and Safe Switching Mechanism

The mechanism uses a high speed ≤ than 3-cycle stored energy switching mechanism. This mechanism can be operated manually under a full load.

Ease of Coordination and Application—Short-Time Withstand

The use of electronic trips has allowed performance curve shaping to facilitate proper system coordination. The most significant is the "short time" rated trip unit.

These trip settings may be set for what are considered extremely high currents for much longer durations than the three-cycle withstand test required under UL 1008. To facilitate improved coordination, Taylor Magnum transfer switches have been tested and are provided with 30-cycle, extended withstand ratings.



Magnum Power-Case Switch

Optional Integral Overcurrent Protection Capability

Optional Digitrip™ Magnum Trip Unit

Service Entrance

For service entrance and other applications, Digitrip solid-state trip units can be integrated into the power switching section. This eliminates the need for separate upstream protective devices, saving cost and space. Available with various combinations of long, short time, instantaneous, ground fault protection and communications.

Service entrance rated transfer switches

Complete protection at the point of service entrance

Why service entrance rated transfer switches? When the entire load of an installation requires standby emergency power for complete protection against commercial power interruption, it becomes necessary to have the ATS as close to the point of service entrance as possible. And nobody does this better than Taylor.

Introduction

With Taylor's service entrance rated transfer switches, installation can be made directly at the point of service entrance—while simultaneously eliminating the need for separate upstream fault protection and their respective power interconnections.

Taylor transfer switches easily integrate the necessary overcurrent protection and service disconnecting capability, thus saving installation space, time and cost.

Significant benefits

- Cost savings
- Space savings
- Reduced installation time
- Code compliance

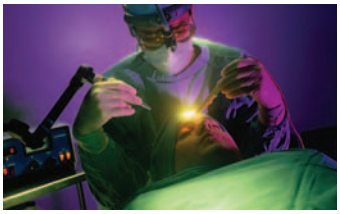
Customer applications

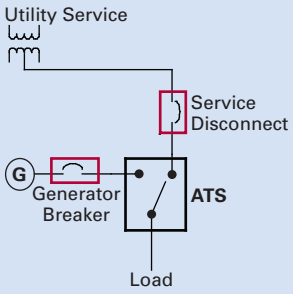
- Water treatment plants
- Pumping stations
- Telecommunications
- Data centers
- Industrial plants
- Hospitals and other institutions

Customer needs

Service entrance, as the name implies, is the point where power supplied by a utility enters a facility. Customers that have critical loads may also require automatic transfer switches. A traditional automatic transfer switch installation would locate the ATS downstream of the service disconnect device of both the utility and the standby (emergency) power sources.

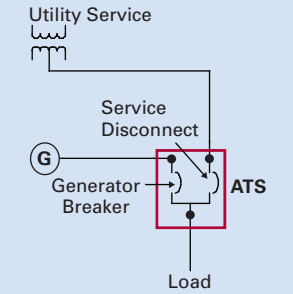
The main or utility source would have its own service disconnect, and the backup generator would also have its own separate generator breaker and breaker enclosure. Separate power cables or bus are also needed to interconnect this equipment.





Conventional approach

- Automatic transfer switch
- Separate generator breaker
- Separate generator breaker enclosure
- Separate service entrance disconnect
- Separate service entrance disconnect enclosure
- Power cable/bus interconnections
- Installation of the separate components
- Additional space requirement
- Added maintenance
- UL® 891 compliance



Taylor approach

Taylor's approach uses a breaker-based automatic transfer switch that is easily applied to service entrance applications by adding an overcurrent trip to the switch and then including the service entrance option. This means that the combined service entrance rated ATS is installed directly at the point of service entrance.

- Transfer switch with service entrance rating
- Single enclosure
- Reduced power cable/bus interconnections
- Reduced space requirements
- UL 1008 compliance

In addition to providing an overcurrent trip to the utility source switch, the emergency source switch can also have an overcurrent trip added.

Features

- UL 1008 service entrance listed transfer switch
- Service disconnect "both off" capability
- Integral overcurrent protection
- Lockout (when in disconnected position only)
- Indication of service disconnect
- Integrated design
- Disconnecting neutral assembly
- Ground fault protection capability—all ratings (required by code on ratings 480V and 1000A or higher)
- Keyed service entrance switch
- Drawout type breakers (available on Magnum™ ratings)

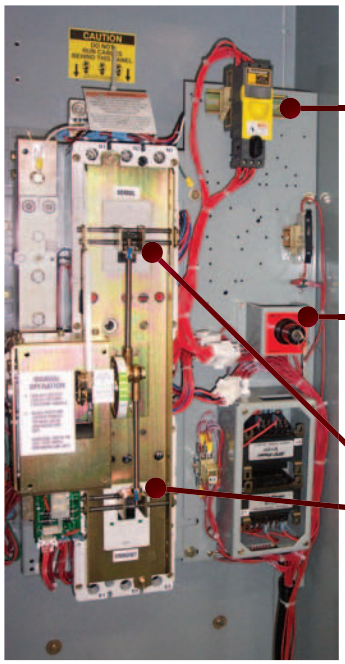
Benefits

- All installation loads protected against extended power loss
- Lockable disconnect position permits safe downstream maintenance
- Eliminates need for separate upstream protective and service disconnect devices
- Combined service disconnect, overcurrent protection and ATS functions substantially reduce overall equipment and installation costs and save space
- Fewer components and power interconnections maximize circuit integrity and minimize maintenance requirements
- Quick restoration of circuit after a trip (versus a fused circuit requiring fuse availability)
- Trip on a fault prohibits transfer to emergency source
- Fused circuit allows testing of switch by simulating a true power failure

Service Entrance Rated Transfer Switches—Meets UL 1008 ❶

Type	Description	Amperes	Controller
RLC1	Residential contactor	100–200	ATC-100
ATH3/ATV3	Automatic wallmount	30–1000	ATC-300
ATHI/ATVI	Automatic wallmount	30–1000	ATC-600
NTHE/NTVE	Non-automatic wallmount	30–1000	None
NTVEMG	Non-automatic floormount	400–5000	None
BIHI	Bypass isolation wallmount	100–1000	ATC-600
ATVIMG	Automatic floormount magnum	400–5000	ATC-600
BIVIMG	Bypass isolation floormount	400–5000	ATC-600
CTVIMG	Automatic floormount Magnum® closed transition	400–5000	ATC-800
CBVIMG	Automatic floormount closed transition	400–5000	ATC-800
CTVCMG	Automatic soft load floormount	400–5000	ATC-5000

❶ 4000 and 5000A per UL 891.

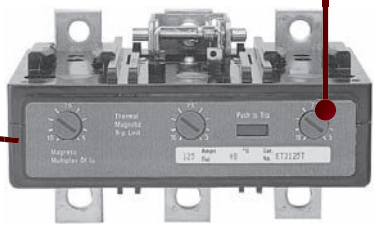


Fused disconnect for service entrance provides disconnect of control power. Allows easy test simulation of a failed power source.

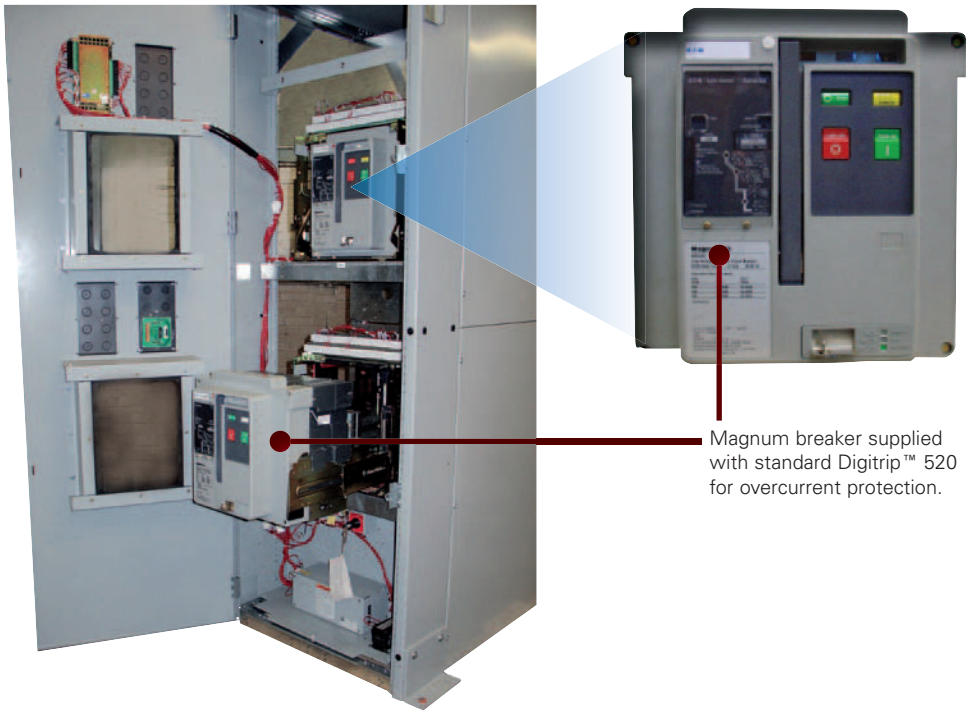
Keyed switch sends breakers to an open position, isolating the load from the power source.

Service Entrance Rated Molded-Case Breaker Transfer Switch

Thermal-magnetic trip eliminates the need for separate upstream protective device for overcurrent protection.



Thermal-Magnetic Trip Unit—Mounted Inside Either or Both Breakers



Magnum breaker supplied with standard Digitrip™ 520 for overcurrent protection.

Service Entrance Rated Magnum Power Breaker Transfer Switch

Service Entrance Label

ATC-600 Controller

ATC-600 Controller

General Description

Taylor's ATC-600is a microprocessor-based logic controller to be used with transfer switches. This device is door-mounted and provides the operator with an at-a-glance overview of switch status and parameters, as well as key diagnostic data. Real-time values for volts and frequency can be viewed via the front panel LED display, along with an indication of the power source currently in use.

The ATC-600 continuously monitors either single-phase or three-phase voltages for Source 1, Source 2 and the load. When the Source 1 voltage or frequency is detected to be below the customer-programmed set points, transfer to Source 2 is initiated. When the Source 2 voltage and frequency are detected to be within the programmed parameters, the transfer occurs.

While the load is connected to Source 2, the ATC-600 continues to monitor Source 1. As soon as the Source 1 voltage and frequency return to within the programmed limits, and after a programmed time delay, a retransfer back to Source 1 is initiated.

The ATC-600 uses microprocessor technology to provide the operator with a vast array of selections. Depending on the application, the user can "customize" the ATC-600 to meet the particular application. A summary of several key selections is listed in **Table 25.4-4.**

Application Description

The ATC-600 is equipped to display history information either via the front panel or over PowerNet™. Source 1 and Source 2 run time, available time, and connect time are available, as well as Load energized time, number of transfers, and the date, time and reason for the last 16 transfers.

For communications capability, the ATC-600 can be equipped with a PONI card that will allow the user to communicate with the unit via Series III software. All settings for purchased options can be set from the faceplate of the unit or downloaded over PowerNet. Series III software allows for charting of key historical data, as well as providing the capability to monitor and control the transfer switch from a remote location.

For further information on PowerNet products and software, see Taylor's *Volume 3—Power Distribution and Control Assemblies, CA08100004E, Tab 22*.

Standards and Certifications

- UL listed component

Technical Data

Table 25.4-7. ATC-600 Controller Specifications

Description	Specification		
Input control power range	65 Vac rms to 160 Vac rms (50/60 Hz)		
Voltage measurements of	Source 1 V_{AB} Source 1 V_{BC} Source 1 V_{CA}	Source 2 V_{AB} Source 2 V_{BC} Source 2 V_{CA}	Load V_{AB} Load V_{BC} Load V_{CA}
Voltage measurement range	0 to 790 Vac rms (50/60 Hz)		
Voltage measurement accuracy	±2% of nominal input voltage		
Frequency measurement for	Source 1 and Source 2		
Frequency measurement range	40 Hz to 80 Hz		
Frequency measurement accuracy	±0.1 Hz		
Undervoltage sensing	Source 1 and Source 2		
Undervoltage dropout range	50–90% of nominal voltage		
Overvoltage dropout range ①	105–120% of nominal voltage		
Underfrequency dropout range ①	90–100% of nominal frequency		
Overfrequency dropout range ①	100–120% of nominal frequency		
Contact Outputs Two Form A contacts for generator start Four Form A contacts for control functions Three Form C contacts for control functions	 5A 250 Vac; 5A 30 Vdc 10A 250 Vac; 10A 30 Vdc 10A 250 Vac; 10A 30 Vdc		
Communications output over PowerNet (optional)	PONI (Product-Operated Network Interface)		
Front Panel Indications Automatic mode Test mode Program mode	 Blinking LED indicates automatic operation LED illuminated indicating the unit is in the TEST mode LED illuminated indicating the unit is in the program mode blinking LED indicates user is viewing set points in program mode		
LED lights to indicate	Source 1 available (amber), Source 2 available (amber), Source 1 connected (green), Source 2 connected (red), Source 1 preferred (red), Source 2 preferred (red), load energized (red)		
LED display to indicate	History information Set points Real-time clock		
Operating temperature range	Operation: –20°C to +70°C/Storage: –30°C to +85°C		

① Optional features.

All ATC-600 programmable features and associated set point possibilities with any required explanations are presented below. Remember, only features originally ordered and factory programmed will appear in the display.

Note: Changing the system nominal voltage or frequency set points will automatically change all the pickup and dropout settings to new default values.

Table 25.4-8. ATC-600 Programming Features/Set Points ①

Programmable Feature Display	Display Explanation	Set Point Range	Factory Default Value	Measure
TDES	Time delay engine start timer	0–120 seconds	0:03	Minutes: seconds
TDNE	Time delay normal to emergency timer	0–1800 seconds	0:00	Minutes: seconds
TDEN	Time delay emergency to normal timer	0–1800 seconds	5:00	Minutes: seconds
TDEC	Time delay engine cool down timer	0–1800 seconds	5:00	Minutes: seconds
TDN	Time delay neutral timer	0–120 seconds	0:00	Minutes: seconds
PRF SRC	Preferred source	None 1 = source 1 0 = source 2	1	—
EXER	Plant exerciser enabled or disabled	0 = disabled 1 = enabled	1	—
MANTR	Re-transfer mode	0 = automatic 1 = PB return	0	—
CTDNE	Commitment to transfer in TDNE	0 = not committed 1 = committed	0	—
TMODE	Engine test with/without load transfer	0 = no load transfer 1 = load transfer 2 = disable test pattern	1	—
TPRE	Pre-transfer sub-network time delay	1–00 seconds	0:01	Minutes: seconds
PHASE	Number of system phases	1 or 3 ②	3	—
TSEQ	Time delay load sequencing	1–120 seconds	0:10	Minutes: seconds
IPHASE	In-phase transition enabled or disabled	1 = enabled 0 = disabled	0	—
IPFD	In-phase transition frequency difference (Hertz)	0.0–3.0 Hz	1.0	Hertz
SYNC	Closed/in-phase transition synchronization timer	1–60 minutes	5	Minutes
TDEF	Time delay engine failure	0–60 seconds	6	Seconds

① Complete list of programming selections found in IB ATS-1005.
② Set to order specific value.

Table 25.5-3. Magnum-Based—Automatic Transfer Switch Features

Feature Number	Description	Open Transition			Closed Transition	
		ATVIMG	NTVEMG	BIVIMG	CTVIMG	CBVIMG
		Magnum Fixed and Drawout Mount ATC-600 Controller	Magnum Fixed and Drawout Mount Non-Automatic Transfer	Bypass Isolation Magnum Drawout ATC-600 Controller	Magnum Fixed and Drawout Mount ATC-800 Closed Transition	Bypass Isolation Drawout ATC-800 Closed Transition
1 1a	Timers Time delay normal to emergency (TDNE) Fixed 2 seconds or 15 seconds	—	—	—	—	—
	Adjustable 0–1800 seconds	S	—	S	S	S
2	Time delay engine start (TDES) Fixed 3 seconds	—	—	—	—	—
	Adjustable 0–120 seconds	S	—	S	S	S
3	Time delay emergency to normal (TDEN) Fixed 1 minute	—	—	—	—	—
	Adjustable 0–1800 seconds	S	—	S	S	S
4	Time delay engine cooldown (TDEC) Fixed 5 minutes	—	—	—	—	—
	Adjustable 0–1800 seconds	S	—	S	S	S
5 5H	Emergency (S2) source sensing Phase reversal	O	—	O	O	O
5J	All-phase undervoltage/underfrequency	S	—	S	S	S
5K	All-phase overvoltage/overfrequency	S	—	S	S	S
6 6B	System or engine test System test pushbutton	S	—	S	S	S
6H	Maintained 4-position test switch	O	—	O	O	O
7	Time delay emergency fail (TDEF) Fixed 6 seconds	—	—	—	—	—
7a	Time delay emergency fail (TDEF) Adjustable 0–6 seconds)	S	—	S	S	S
8 8C	Pushbutton bypass Bypass TDEN	S	—	S	S	S
8D	Bypass TDNE	S	—	S	S	S
9 9B	Maintenance selector switch Electrical operator isolator switch	O	—	O	O	O
10 10B	Preferred source selector Utility to utility or utility to generator	S	—	S	S	S
10D	Generator to generator	S	—	S	S	S
 12C	Indicating lights Normal (S1) source connected	S	S	S	S	S
12D	Emergency (S2) source connected	S	S	S	S	S
12G	Normal (S1) source available	S	S	S	S	S
12H	Emergency (S2) source available	S	S	S	S	S
12L	Normal (S1) source tripped (requires Feature 16)	O	O	O	O	O
12M	Emergency (S2) source tripped (requires Feature 16)	O	O	O	O	O
14 14C	Auxiliary relay contacts Normal (S1) source available 4 Form C	O	O	O	O	O
14D	Emergency (S2) source available 4 Form C	O	O	O	O	O
14E	Normal (S1) source available 1 Form C	S	—	S	S	S
14F	Emergency (S2) source available 1 Form C	S	—	S	S	S
14G	Normal (S1) source available 2 Form C	—	O	—	—	—
14H	Emergency (S2) source available 2 Form C	—	O	—	—	—
15 15E	Position contacts Normal (S1) source position 1 Form C	S	—	S	S	S
15F	Emergency (S2) source position 1 Form C	S	—	S	S	S

Note: S = Standard, O = Optional

Table 25.5-3. Magnum-Based—Automatic Transfer Switch Features (Continued)

Feature Number	Description	Open Transition			Closed Transition	
		ATVIMG	NTVEMG	BIVIMG	CTVIMG	CBVIMG
		Magnum Fixed and Drawout Mount ATC-600 Controller	Magnum Fixed and Drawout Mount Non-Automatic Transfer	Bypass Isolation Magnum Drawout ATC-600 Controller	Magnum Fixed and Drawout Mount ATC-800 Closed Transition	Bypass Isolation Drawout ATC-800 Closed Transition
16 16N	Integral overcurrent protection Normal (S1) switch only	O	O	O	O	O
16E	Emergency (S2) switch only	O	O	O	O	O
16B	Normal (S1) and emergency (S2) switches	O	O	O	O	O
18	Metering	O	O	O	O	O
	IQ 130	O	O	O	O	O
	IQ 140	O	O	O	O	O
	IQ 150	O	O	O	O	O
	IQ 250	O	O	O	O	O
	IQ 260	O	O	O	O	O
	PXM 2250	O	O	O	O	O
	PXM 2260	O	O	O	O	O
	PXM 2270	O	O	O	O	O
	PX 4000	O	O	O	O	O
	PX 6000	O	O	O	O	O
	PX 8000	O	O	O	O	O
20A	Rear bus connections	O	O	O	O	O
21A	Non-standard terminals	O	O	O	O	O
22	Ground bus with provisions to attach to neutral	S	S	S	S	S
22A	18-conductor ground bus 500 or 750 kcmil	O	O	O	O	O
22B	30-conductor ground bus 500 or 750 kcmil	O	O	O	O	O
22C	Special ground bar—contact factory	O	O	O	O	O
23 23J	Plant exerciser Selectable—disabled/7 day interval, 0–600 minutes, load/no load, with fail-safe	S	—	S	S	S
23L	24-hour, 7-day, 365-day programmable programmable plant exciser	—	—	O	O	O
26 26D	Normal (S1) source sensing Go to emergency (S2) input	S	—	S	S	S
26H	Phase reversal protection	O	—	O	O	O
26J	All-phase undervoltage/underfrequency	S	—	S	S	S
26K	All-phase overvoltage/overfrequency	S	—	S	S	S
29 29G	Alternative transfer modes of operation Selector switch for automatic or non-automatic operation (switch must be labeled as non-automatic)	O	—	O	O	O
29J	Automatic transfer operation with selectable (via programming) automatic or non-automatic retransfer operation with fail-safe	O	—	O	O	O
32 32A	Delayed transfer operation modes Time delay neutral adjustable 0–120 seconds (available on 3-position contactors and breaker-based design)	S	—	S	—	—
32B	Load voltage decay adjustable	O	—	O	—	—
32C	2–30% nominal voltage In-phase monitor defaults to load voltage decay	O	—	O	—	—
32D	In-phase monitor defaults to time delay neutral	O	—	O	—	—
34F	100.00 inches (2540.0 mm) open Magnum only	O	O	—	—	—
35A	Pretransfer Sig-I contacts 1 Form C	O	—	O	—	—
36	Load shed from emergency	O	—	O	O	O

Note: S = Standard, O = Optional

Table 25.5-3. Magnum-Based—Automatic Transfer Switch Features (Continued)

Feature Number	Description	Open Transition			Closed Transition	
		ATVIMG	NTVEMG	BIVIMG	CTVIMG	CBVIMG
		Magnum Fixed and Drawout Mount ATC-600 Controller	Magnum Fixed and Drawout Mount Non-Automatic Transfer	Bypass Isolation Magnum Drawout ATC-600 Controller	Magnum Fixed and Drawout Mount ATC-800 Closed Transition	Bypass Isolation Drawout ATC-800 Closed Transition
37	Go to isolated position (not SE rated)	O	—	O	O	O
37A	Rated as suitable for use as service equipment (requires 16B or 16N or 16E) Without ground fault protection ①	O	O	O	O	O
37B	Rated as suitable for use as service equipment (requires 16B or 16N or 16E) With ground fault protection	O	O	O	O	O
38 38A	Stainless steel device covers SS cover for device plate or service equipment disconnect	O	O	O	O	O
38B	SS cover for controller	O	O	O	O	O
41 41E	Space heater with thermostat 375 watts	O	O	O	O	O
42	Seismic IBC, UBC	S	S	S	S	S
45 45A	Load sequencing contacts Load sequencing contacts (1)	O	—	O	O	O
45B	Load sequencing contacts (2)	O	—	O	O	O
45C	Load sequencing contacts (3)	O	—	O	O	O
45D	Load sequencing contacts (4)	O	—	O	O	O
45E	Load sequencing contacts (5)	O	—	O	O	O
45F	Load sequencing contacts (6)	O	—	O	O	O
45G	Load sequencing contacts (7)	O	—	O	O	O
45H	Load sequencing contacts (8)	O	—	O	O	O
45I	Load sequencing contacts (9)	O	—	O	O	O
45J	Load sequencing contacts (10)	O	—	O	O	O
47 47C	Closed transition operation-l modes (user must specify mode) Closed transition in-phase with default to load voltage decay	—	—	—	O	O
47D	Closed transition	—	—	—	O	O
47E	Closed transition in-phase with defaults to time delay neutral	—	—	—	O	O
48 48A	Communications IPONI module (INCOM communications)	O	—	O	O	O
48D	Ethernet communication 10Base-T only (PXG-400 Gateway)	O	—	O	O	O
48F	EPONI module (10Base-T and 10Base-FL) MPONI module (Modbus)	O	—	O	O	O
48R	Remote annunciator	O	—	O	O	O
48RAC	Remote annunciator with control	O	—	O	O	O
49a	Sensing isolation transformer Magnum	O	—	O	—	—

① Ground fault protection is required for service disconnects rated 1000A or more if the electrical service is a solidly grounded wye system of more than 150V to ground but not exceeding 600V phase to phase.

Note: S = Standard, O = Optional

Table 25-5-3. Magnum-Based—Automatic Transfer Switch Features (Continued)

Feature Number	Description	Open Transition			Closed Transition	
		ATVIMG	NTVEMG	BIVIMG	CTVIMG	CBVIMG
		Magnum Fixed and Drawout Mount ATC-600 Controller	Magnum Fixed and Drawout Mount Non-Automatic Transfer	Bypass Isolation Magnum Drawout ATC-600 Controller	Magnum Fixed and Drawout Mount ATC-800 Closed Transition	Bypass Isolation Drawout ATC-800 Closed Transition
51S1B	50 kA SPD standard source 1	O	O	O	O	O
51S2B	80 kA SPD standard source 1	O	O	O	O	O
51S3B	100 kA SPD standard source 1	O	O	O	O	O
51S4B	120 kA SPD standard source 1	O	O	O	O	O
51S5B	160 kA SPD standard source 1	O	O	O	O	O
51S6B	200 kA SPD standard source 1	O	O	O	O	O
51S7B	250 kA SPD standard source 1	O	O	O	O	O
51S8B	300 kA SPD standard source 1	O	O	O	O	O
51S9B	400 kA SPD standard source 1	O	O	O	O	O
51S1C	50 kA SPD standard with surge counter source 1	O	O	O	O	O
51S2C	80 kA SPD standard with surge counter source 1	O	O	O	O	O
51S3C	100 kA SPD standard with surge counter source 1	O	O	O	O	O
51S4C	120 kA SPD standard with surge counter source 1	O	O	O	O	O
51S5C	160 kA SPD standard with surge counter source 1	O	O	O	O	O
51S6C	200 kA SPD standard with surge counter source 1	O	O	O	O	O
51S7C	250 kA SPD standard with surge counter source 1	O	O	O	O	O
51S8C	300 kA SPD standard with surge counter source 1	O	O	O	O	O
51S9C	400 kA SPD standard with surge counter source 1	O	O	O	O	O
51SC8	Remote display panel cable (8 feet standard)	O	O	O	O	O
51SC12	Remote display panel cable (12 feet)	O	O	O	O	O
51SC4	Remote display panel cable (4 feet)	O	O	O	O	O
54a	Front-access cabinet (Magnum design only)	O	O	O	O	O
55b	Source 1 bottom mounting	O	—	O	O	O
57a	Magnum breaker lift device (1)	O	O	O	O	O
57b	Magnum breaker lift device (2)	O	O	O	O	O
58a	Shutterless cassette	S	S	S	S	S
58b	Shuttered casette	O	O	O	O	O
59a	Silver-plated bus	S	S	S	S	S
59b	Tin-plated bus	O	O	O	O	O
80A	Emergency (S2) inhibit contact	O	—	O	O	O
81A	General alarm indicator contact	O	—	O	O	O

Note: S = Standard, O = Optional

Feature Description

Timers

1. Time Delay Normal to Emergency (TDNE)

Provides a time delay to allow for the generator to warm up before transferring the load to the emergency source. Timing begins only after the Emergency Source becomes available and is deemed good based on the programmable voltage and frequency set points in the controller.

2. Time Delay Engine Start (TDES)

Provides a time delay before initiating the generator start cycle. This is to account for momentary power outages or voltage fluctuations of the normal source. Provides a Form C contact to the generator starter circuit.

3. Time Delay Emergency to Normal (TDEN)

Provides a time delay of the retransfer operation to permit stabilization of the normal source. Timing begins only after the normal source becomes available and is deemed good based on the programmable voltage and frequency set points in the controller. This function is fail-safe protected.

4. Time Delay Engine Cooldown (TDEC)

Provides a time delay before initiating the generator stop cycle after the retransfer operation. This allows the generator to cool down by running unloaded. Timing begins on completion of the retransfer cycle.

Source 2 Sensing

5. Source 2—Monitoring and Protection

Provides monitoring and protection based on the Source 2 voltage and/or frequency set points. All **Feature 5** monitoring and protection functions are fail-safe operations.

5J. All-Phase Undervoltage/ Underfrequency Protection

Provides undervoltage/underfrequency monitoring and protection based on programmable set points in the controller.

5K. All-Phase Overvoltage/ Overfrequency Protection

Provides overvoltage/overfrequency monitoring and protection based on programmable set points in the controller.

5H. Three-Phase Rotation Protection

Provides three-phase reversal sensing in order to protect against transferring to an out-of-phase source. The controller will treat the opposite source as unavailable if the sources are out of phase, based on programmable set points in the controller.

5L. Three-Phase Voltage Unbalance/ Phase Loss

Provides phase loss detection from blown fuses on the Source 2 supply circuit.

6B. Test Operators

Automatic transfer switches are provided with a controller faceplate test pushbutton that simulates a loss of the Source 1 as standard. All programmed time delays (TDNE, TDEN, etc.) will be performed as part of the test. Engine run time of the test is equal to the plant exerciser programmed set point. All tests are fail-safe protected.

6H. 4-Position Test Selector Switch (FPSS)

Provides a door-mounted 4-position, maintained contact selector switch marked "Auto," "Test," "Engine Start," and "Off." The FPSS is fail-safe protected, except for the "Off Position." Transfer switch operation is determined by the switch position. Transfer switch operations are as follows:

"Auto"—Automatic operation mode.

"Test"—A load test is performed until the switch is moved to another position.

"Engine Start"—A no-load test is performed until the switch is moved to another position.

"Off"—The automatic transfer controller and engine start contact are disabled. A white pilot light is provided to indicate that the FPSS is in the "Off" position.

7. Time Delay Emergency Fail (TDEF)

Provides a time delay that prevents a connected emergency source from being declared "unavailable" based on the customer's set points. This is to account for momentary generator fluctuations. If the Source 2 remains in a failed state, then 0.5 second after the TDEF timer expires the transfer switch will proceed with the programmed sequence for retransfer if Source 1 is available. This time delay is only implemented when Source 2 is a generator.

Note: This feature is also enabled when large loads cause generator output to drop below customer set points.

8. Time Delay Bypass Pushbutton

Provides a momentary contact pushbutton to bypass the TDNE (**Feature 1**) and/or TDEN (**Feature 3**) time delays. The Time Delay Bypass Pushbutton contact, when closed, will reduce any or all of the programmed time delay to zero. Must be executed when TDNE or TDEN timer is displayed on the controller.

8C. Bypass Time Delay Emergency to Normal (TDEN)

8D. Bypass Time Delay Normal to Emergency (TDNE)

9B. Maintenance Selector Switch (MSS)

Provides a 2-position, maintained contact selector switch marked "Operate" and "Disable." When the MSS is placed in the "Disable" position, the controller logic will be disconnected from the transfer motor circuit. The MSS is placed in the "Operate" position for normal automatic operation.

10. Preferred Source Selector

Provides a means to designate either Source 1 or Source 2 as the "Preferred" source. The "Preferred" source is the source that the transfer switch will connect the load to if it is available.

Note: This is a programmable software feature not an actual switch.

10B. Preferred Source Selector

Provides a programmable source selector for use on systems comprised of dual utility or utility and engine/ generator power sources.

10D. Preferred Source Selector

Provides a programmable source selector for use on systems comprised of dual engine/generator power sources. (Dual engine starting circuits are provided.)

12C. Source 1—Load Connected

Provides a green indication that indicates the load is connected to Source 1 when lit.

12D. Source 2—Load Connected

Provides a red indication that indicates the load is connected to Source 2 when lit.

Feature Description (Continued)

12G. Source 1—Present

Provides a white or amber indication "Depending on the Controller" that Source 1 has power; however, this does not indicate whether Source 1 is acceptable.

12H. Source 2—Present

Provides an amber indication that Source 2 has power; however, this does not indicate whether Source 2 is acceptable.

Overcurrent Trip Indication

Available only with integral overcurrent protection (**Feature 16**) (shown on automatic transfer controller display).

12L. Source 1 Trip Indication

The automatic transfer controller display will read "Lockout" if the Source 1 circuit breaker is in the "tripped" position.

12M. Source 2 Trip Indication

The automatic transfer controller display will read "Lockout" if the Source 2 circuit breaker is in the "tripped" position.

14. Relay Auxiliary Contacts

14C. Source 1 Present

Provides 4 Form C relay auxiliary contacts. The relay is energized when Source 1 is present.

14D. Source 2 Present

Provides 4 Form C relay auxiliary contacts. The relay is energized when Source 2 is present.

14E. Source 1 Available

Provides 1 Form C relay auxiliary contact. The relay is energized when Source 1 is available and within the controller's programmable set points.

14F. Source 2 Available

Provides 1 Form C relay auxiliary contact. The relay is energized when Source 2 is available and within the controller's programmable set points.

14G. Source 1 Present

Provides 2 Form C relay auxiliary contacts. The relay is energized when Source 1 is present.

14H. Source 2 Present

Provides 2 Form C relay auxiliary contacts. The relay is energized when Source 2 is present.

15. Switch Position Indication Contact

Provides a contact that indicates if the power switching device is in the "open" or "closed" position.

15E. Source 1 Position Indication Contact

Provides 1 Form C contact that indicates the position of the Source 1 power switching device.

15F. Source 2 Position Indication Contact

Provides 1 Form C contact that indicates the position of the Source 2 power switching device.

15M. Source 2 Load Shed Contacts

Provides 4 Form C contacts to initiate a load circuit disconnect while on Source 2. This gives the user the capability of selectively choosing not to run certain loads while on Source 2.

16B. Integral Overcurrent Protection on Both Power Source Switching Devices

Provides integral overcurrent protection on both Source 1 and Source 2 power switching devices.

16E. Integral Overcurrent Protection on the Source 2 Power Switching Device

Provides integral overcurrent protection on the Source 2 power switching device.

16N. Integral Overcurrent Protection on the Source 1 Power Switching Device

Provides integral overcurrent protection on the Source 1 power switching device.

16S. External Overcurrent Protection on the Source 1 Power Switching Device

Provides overcurrent protection on the Source 1 power switching device.

18. Metering

The ATS controller provides voltage and frequency readings. If additional metering functions are required, Taylor offers a series of digital meters that may be added to the ATS. The meter type can provide simple current and voltage readings or more capable meters providing Power, Demand and energy readings.

Available with an optional communications interface. (See **Feature 48**—Communications for available communication modules.)

Feature 18 metering options include all required external devices (CTs, etc.) for a fully functioning metering system.

IQ 130/140/150

IQ 130

This digital meter provides basic current and voltage per phase (L-L, L-N) and min./max. readings (I, V). Optional communication RS-485, Modbus RTU.

IQ 140

In addition to basic current and voltage, will provide frequency, power measurements real, reactive and apparent power, total (W, VAR, VA). Optional communication RS-485, Modbus RTU.

IQ 150

In addition to basic current/voltage/frequency and power readings, will provide Energy Real reactive and apparent (Wh, VAR, Vah). Optional communication RS-485, Modbus RTU.

IQ 250/260

IQ 250

This digital meter provides current per phase and current demand, voltage (L-L, L-N) and frequency. Power, energy and demand readings. Real, reactive and apparent power and energy, power factor. RS-485 communications, Modbus RTU or ASCII. Optional I/O slots available.

IQ 260

In addition to all of the features of the IQ 250, power quality analysis is available with THD voltage and current per phase.

Power Xpert 2000

Provides either a Power Xpert PXM 2250, PXM 2260 or PXM 2270 meter.

Power Xpert 4000, 6000, 8000

Provides one of the Power Xpert Meters with or without graphic displays.

18W. Ammeter Side Metering

Provides an ammeter for monitoring the load side circuit.

20A. Rear Bus Provisions

Provides Source 1, Source 2 and Load Circuit rear accessible bus stabs with provision for bus bar connection. Taylor transfer switches are provided with either front or rear (dependant on switch type) connected solderless screw-type terminals for power cable connection as standard.

Feature Description (Continued)

21A. Optional Power Cable Connection Terminals

Taylor transfer switches are provided as standard with Source 1, Source 2 and load circuit solderless screw-type terminals for power cable connection. Alternate terminal wire sizes, and compression lug provisions may be available dependant on transfer switch type and ampere rating.

Plant Exerciser

23A. Plant Exerciser With Fail-Safe

Provides a means for automatic testing of the engine generator set or standby power system. All programmed time delays in the controller will be performed during plant exerciser operations.

Programmable set points for test intervals are start time, either disabled, daily, 7, 14 or 28 days.

15-minute fixed engine test time.

Test may be performed with or without load transfer. Test may be manually cancelled during the operation. This function is fail-safe protected.

23J. Plant Exerciser (PE) With Fail-Safe

Provides a means for automatic testing of the engine generator set or standby power system. All programmed time delays in the controller will be performed during the plant exerciser operation.

Programmable set points for test interval are start time, either disabled or 7 days, and engine test time.

Test may be performed with or without a load transfer. Test may be manually cancelled during the operation. This is a fail-safe operation.

23K. Plant Exerciser With Fail-Safe

Provides a means for automatic testing of the engine generator set or standby power system. All programmed time delays in the controller will be performed during plant exerciser operations.

Programmable set points for test intervals are start time, either disabled, daily, 7, 14 or 28 days, engine test time.

Test may be performed with or without load transfer. Test may be manually cancelled during the operation. This function is fail-safe protected.

26D. Go to Emergency (Source 2)

Provides the capability for an external contact closure to initiate a transfer to the Source 2 power source. This includes starting the generator, performing the programmed time delays and the transfer operation. Retransfer will occur when the external contact is opened. This is a fail-safe function.

Source 1 Sensing

26. Source 1—Monitoring and Protection

Provides Source 1 monitoring and protection functions. If Source 1 fails, then the automatic transfer controller will begin the sequence of operations necessary to transfer the load to Source 2. All **Feature 26** monitoring and protection functions are fail-safe operations.

26H. Three-Phase Rotation Protection

Provides three-phase reversal sensing in order to protect against transferring to an out-of-phase source. The controller will treat the opposite source as unavailable if the sources are out of phase, based on programmable set points in the controller.

26J. All-Phase Undervoltage/ Underfrequency Protection

Provides all-phase undervoltage/ underfrequency monitoring and protection based on programmable set points in the controller.

26K. All-Phase Overvoltage/ Overfrequency Protection

Provides all-phase overvoltage/ overfrequency monitoring and protection based on programmable set points in the controller.

26L. Three-Phase Voltage Unbalance/ Phase Loss

Provides phase loss detection from blown fuses on the Source 1.

26M. Generator Utility Sensing

Allows for the switch to operate with generators that have internal utility sensing. This option comes as a kit that needs to be field installed.

26N. All-Phase Undervoltage Protection

Provides undervoltage protection for Source 1 (ATC-100 Controller only).

29. Transfer Operation Modes

Provides standard or optional transfer modes, mode selection devices and operational methods for transfer switches.

29J. Automatic Transfer or Automatic Transfer With Non-Automatic Retransfer Operation

Provides a field-selectable programmable set point that permits the transfer switch to operate in one of the following two transfer modes (A or B):

A. Fully automatic operation.

B. Automatic engine/generator startup and automatic transfer operation from Source 1 to Source 2. Manual pushbutton operation is required to initiate the retransfer operation and engine/generator shutdown. The pushbutton for manual retransfer operation is included. This is fail-safe protected.

29G. Automatic/Manual Operation With Selector Switch

Provides 2-position selector switch (labeled Auto/manual) that permits selection of the automatic or manual transfer. When in the “Auto” position, the transfer switch operates with fully automatic transfer, retransfer and generator startup and shutdown operations. When in the “Manual” position, manual operation is required to initiate the generator startup or retransfer with generator shutdown operations.

Note: Transfer switches with **Feature 29** must be labeled as non-automatic transfer switch equipment.

32. Delayed Transition Transfer Modes for Open Transition Transfer Switches

Provides delayed transition transfer modes for an open transition transfer switch. Often used in systems with inductive loads, a delayed transition transfer switch may prevent or reduce inrush currents due to out-of-phase switching of inductive loads.

32A. Time Delay Neutral

Provides a time delay in the neutral position during the transfer and retransfer operations during which both Source 1 and Source 2 are disconnected from the load circuit. This allows inductive loads time to reach a safe voltage and eliminate back EMF. The time delay is programmable and is the same for both transfer and retransfer operations. This is a passive feature that requires the consulting engineer/installer to determine the settings based on how the user will operate the facility. Adjustable 0–120 seconds.

Feature Description (Continued)

32B. Load Voltage Decay
Provides load voltage measurement to sense back EMF that is generated when the transfer switch is the neutral position. It provides a delay in transfer in either direction if an unacceptable level is sensed as established by a programmed set point. This is an active feature that adapts to how the facility is operating in order to minimize neutral position wait time, but ensure safety. Adjustable 2–30% of nominal voltage.

32C. In-Phase Transition With Default to Load Voltage Decay
Provides in-phase transition, which is a feature that will permit a transfer or retransfer between two available sources that have a phase angle difference near zero. The in-phase transition feature includes permissible frequency difference and synchronization time set points. In the event Source 1 and Source 2 fail to synchronize within the permitted frequency difference and time, then the controller defaults to the load voltage decay operation as described in **Feature 32B**. Adjustable frequency difference 0.0–3.0 Hz. Adjustable synchronization time allowance 1–60 minutes.

32D. In-Phase Transition With Default to Time Delay Neutral
Provides in-phase transition, which is a feature that will permit a transfer or retransfer only between two available sources that have a phase angle difference near zero. The in-phase transition feature includes permissible frequency difference and synchronization time set points. In the event Source 1 and Source 2 fail to synchronize within the permitted frequency difference and time, then the controller defaults to the time delay neutral operation as described in **Feature 32A**. Adjustable frequency difference 0.0–3.0 Hz. Adjustable synchronization time allowance 1–60 minutes.

32E. Delayed Transition
The transfer and re-transfer operations during which both Source 1 and Source 2 are disconnected from the load circuit. The time delay is programmable and the same for both transfer and re-transfer operation. Adjustable 3–60 seconds.

32F. In-Phase Transition
Provides in-phase transition, this feature will permit a transfer or retransfer between two available sources that have a phase angle difference of 8 degrees or less. The in-phase transition feature includes permissible frequency difference and synchronization time set points. In the event Source 1 and Source 2 fail to synchronize within the permitted frequency difference and time, the Alarm relay will energize and "Failed to Sync" will be displayed on Line 1 of the controller. After resetting the alarm, another in-phase transition may be attempted or a non-synchronized transfer may be initiated by failing the connected source. The adjustable frequency difference is 0.0 to 3.0 Hz. If the synchronization does not occur within a specified amount of time, the Alarm relay will energize and the failure will be logged into the transfer history as either "Sync Fail - Freq" or "Sync Fail - Phase" depending on whether the frequency difference or the phase difference was excessive.

32G. Time Delay Neutral
This feature provides a time delay in the neutral position during the transfer and retransfer operations during which both the utility source and the generator source are disconnected from the load circuit. TDN cannot be implemented on a transfer switch using a 2-position contactor.

Jumper selectable at disable (0 seconds) or enable (2 seconds).

Logic Extender Cable

34A. 48 Inches (1219 mm)
Provides logic extension cable with connectors.

34C. 96 Inches (2438 mm)
Provides logic extension cable with connectors.

34E. 144 Inches (3658 mm)
Provides logic extension cable with connectors.

34F. 100 Inches (2540 mm)
Provides logic extension only for open Magnum ATS.

35A. Pretransfer Signal With 1 Form C Contact
Provides a signal prior to the transferring of the load. Will not transfer until the programmable delay set point in the controller is reached. If both sources are not available, this option will ignore the time delay set in the controller.

36. Load Shed From Emergency
Provides the capability for an external NC contact to initiate a load circuit disconnection from the Source 2 power source. If the load circuit is connected to Source 2 and the contact is opened, then a retransfer to Source 1 is completed if Source 1 is available. If Source 1 is not available, then the transfer switch will transfer to neutral. If the load circuit is connected to Source 1 and the contact is open, then a transfer Source 2 is prohibited.

37. Service Equipment Rated Transfer Switch
Provides the label "suitable for use as service equipment" and the features necessary to meet the requirements for the label. Includes service disconnect with visible indication and neutral assembly with removable |link. **Feature 16B** or **16N** must be selected separately.

37A. Service Equipment Rated Transfer Switch Without Ground Fault Protection
Provides service equipment rating for an application that does not require ground fault protection.

37B. Service Equipment Rated Transfer Switch With Ground Fault Protection
Provides service equipment rating for an application that requires ground fault protection.

38. Steel Cover
Provides protection for a device panel as option 38a and protection for the controller as option 38b.

39. Distribution Panel
The distribution panel feature utilizes a panelboard design with bolt-on circuit breakers type EHD. Bolt-on breakers are designed to hold up to the changes in temperature and humidity that an industrial application calls for. (240/120 Vac single-phase systems only.)

39A. 225A With (2) 200A Feeders

39B. 300A With (3) 200A Feeders

39C. 400A With (4) 200A Feeders

Feature Description (Continued)

41. Space Heater With Thermostat
Provides a space heater and adjustable thermostat. External control power is not required. Availability is dependent on transfer switch type.

41A. Space Heater With Thermostat—100 Watt
Provides 100-watt space heater with an adjustable thermostat.

41E. Space Heater With Thermostat—375 Watt
Provides 375-watt space heater with an adjustable thermostat.

42. Seismic Certification
Provides a seismic certified transfer switch with certificate for application that is seismic Zone 4 under the California Building Code (CBC), the Uniform Building Code (UBC) and BOCA, and International Building Code (IBC).

45. Load Sequencing Capability
Provides the capability for sequential closure of up to 10 addressable relays after a transfer. Each addressable relay provides (1) Form C contact. A single adjustable time delay between each of the relay closures is provided. Operates via a sub-network. Adjustable 1–120 seconds.

45A. Load Sequencing Contact
Provides (1) addressable relay.

45B. Load Sequencing Contact
Provides (2) addressable relays.

45C. Load Sequencing Contact
Provides (3) addressable relays.

45D. Load Sequencing Contact
Provides (4) addressable relays.

45E. Load Sequencing Contact
Provides (5) addressable relays.

45F. Load Sequencing Contact
Provides (6) addressable relays.

45G. Load Sequencing Contact
Provides (7) addressable relays.

45H. Load Sequencing Contact
Provides (8) addressable relays.

45I. Load Sequencing Contact
Provides (9) addressable relays.

45J. Load Sequencing Contact
Provides (10) addressable relays.

47. Transfer Modes for Closed Transition Transfer Switches
Provides available transition transfer modes for a closed transition transfer switch. Closed transition is a "make before break" transfer and retransfer scheme that will parallel (a maximum of 100 ms) Source 1 and Source 2 providing a seamless transfer when both sources are available. The closed transition feature includes permissible voltage difference frequency difference and synchronization time allowance set points. The phase angle difference between the two sources must be near zero for a permitted transfer. These are all programmable set points in the controller.

47C. Closed Transition With Default to In-Phase Transition With Default to Load Voltage Decay
Provides a closed transition transfer as the primary transfer mode. In the event Source 1 and Source 2 fail to synchronize within the permitted voltage difference, frequency difference, phase angle difference and time, then the controller defaults to the in-phase transition with default to load voltage decay operations as described in **Feature 32C** and **32B**. Adjustable frequency difference 0.0–0.3 Hz. Adjustable voltage difference 1–5% volts. Adjustable synchronization time allowance 1–60 minutes.

47D. Closed Transition
Provides a closed transition transfer as the primary transfer mode. Only under a fail-safe condition (i.e., loss of the connected source) will the controller transfer to the alternate source using the load voltage decay operation as described in **Feature 32B32B**. Adjustable frequency difference 0.0–0.3 Hz. Adjustable voltage difference 1–5% V.

47E. Closed Transition With Default to In-Phase Transition With Default to Time Delay Neutral
Provides a closed transition transfer as the primary transfer mode. In the event Source 1 and Source 2 fail to synchronize within the permitted voltage difference, frequency difference, phase angle difference and time, then the controller defaults to the in-phase transition with default to time delay neutral operation as described in **Features 32D** and **32A32B32A**. Adjustable frequency difference 0.0–0.3 Hz. Adjustable voltage difference 1–5 percent volts. Adjustable synchronization time allowance 1–60 minutes.

47F. Closed/Load Voltage Decay
ATC-800 controllers equipped with Feature Set 47F will perform a closed transition when both sources are synchronized in frequency, phase and voltage. Failure to synchronize will result in an open transition Time Delay Load Voltage Decay transfer. Time Delay Load Voltage Decay uses the load voltage measurements to sense back EMF that is generated when the transfer switch is in the Neutral position. It provides a delay in transfer in either direction if an unacceptable level is sensed as established by a customer programmed level. The transfer will not take place until the back EMF decays below the acceptable programmed level. This feature has a separate setting of enabling or disabling the operation. If disabled, the transfer switch will not delay in the Neutral position and will transfer between the sources as fast as possible. This feature is not available with the Time Delay Neutral Optional **Feature 32A**.

47G. Closed/Time Delay Neutral
ATC-800 controllers equipped with Feature Set 47F will perform a closed transition transfer when both sources are synchronized in frequency, phase and voltage. Failure to synchronize will result in an open transition Time Delay Neutral transfer. Time Delay Neutral provides a time delay in the transfer switch neutral position when both sources are open. This delay takes place when the load is transferred in either direction to prevent excessive in-rush currents due to out-of-phase switching of large motor loads.

48. Communication Modules
Provides communications modules for the ATC-300, ATC-600 and ATC-800 transfer switch controllers.

48A. INCOM
Communication (IPONI) Provides Taylor's proprietary INCOM protocol communications modules.

48D. Ethernet

Communication (PXG400 Gateway)
Translates Modbus RTU, QCPort or INCOM to Modbus TCP. The PXG400 Gateway includes embedded Web server monitoring of up to 64 connected devices. (Includes the IPONI with the ATC-600 and ATC-800 controllers.)

Feature Description (Continued)

48F. Modbus

Communication (MPONI)

Provides Modbus RTU protocol via communications module.

48R. Remote Annunciator

Provides remote monitoring of source availability, source position and test status for the ATC-600 and ATC-800 controllers. Operates via the controller sub-network.

48RAC. Remote Annunciator with Control

Provides remote monitoring and control via a color touch screen display for the ATC-300, ATC-600 and ATC-800 controllers. Operates using Modbus protocol (MPONI required for the ATC-600 and 800).

Option 51. Surge Protection Device

Two types of surge protection devices are used in Taylor automatic transfer switches. Both types meet the requirements for UL 1449 3rd Edition for surge suppression devices and are CE marked. The type CVX is used on Taylor wallmount ATS designs and the Taylor type SPD are used on floor-standing designs.

CVX

The CVX device features a Thermally Protected Metal Oxide Varistor technology and comes with high intensity LED phase status indicators.

SPD

The SPD features a Thermally Protected Metal Oxide Varistor technology. It comes with dual-colored protection status indicators for each phase and for neutral-ground protection mode. It comes with an audible alarm with silence button and a Form C contact.

An optional SPD with surge counter feature package is available. This provides six-digit surge counter with reset button.

51S1B. 50 kA—SPD standard source 1

51S2B. 80 kA—SPD standard source 1

51S3B. 100 kA—SPD standard source 1

51S4B. 120 kA—SPD standard source 1

51S5B. 160 kA—SPD standard source 1

51S6B. 200 kA—SPD standard source 1

51S7B. 250 kA—SPD standard source 1

51S8B. 300 kA—SPD standard source 1

51S9B. 400 kA—SPD standard source 1

51S1C. 50 kA—SPD standard with surge counter source 1

51S2C. 80 kA—SPD standard with surge counter source 1

51S3C. 100 kA—SPD standard with surge counter source 1

51S4C. 120 kA—SPD standard with surge counter source 1

51S5C. 160 kA—SPD standard with surge counter source 1

51S6C. 200 kA—SPD standard with surge counter source 1

51S7C. 250 kA—SPD standard with surge counter source 1

51S8C. 300 kA—SPD standard with surge counter source 1

51S9C. 400 kA—SPD standard with surge counter source 1

51SC8. Remote display panel (8 feet standard)

51SC12. Remote display panel (12 feet)

51SC4. Remote display panel (4 feet)

54. Front Access

54A. Front access cabinet available for all Magnum products. This option will add an additional pull section mounted on the side of the switch.

59a. Silver-Plated Bus

Silver-plated bus is a standard feature for all Magnum-based designs.

59b. Tin-Plated Bus

Tin-plated bus is available as an option for Magnum-based designs.

Glossary

With respect to their use in this document and as they relate to switch operation, the following terminology is defined:

Available—A source is defined as "available" when it is within its undervoltage/overvoltage/underfrequency/overfrequency (if applicable) set point ranges for the nominal voltage and frequency setting.

Fail-safe—A feature that prevents disconnection from the only available source and will also force a transfer or retransfer operation to the only available source.

Retransfer—Retransfer is defined as a change of the load connection from the secondary to primary source.

Source 1—is the primary source or normal source or normal power source or normal. (Except when Source 2 has been designated the "Preferred Source.")

Source 2—is the secondary source or emergency source or emergency power source or emergency or standby or backup source. (Except when Source 2 has been designated the "Preferred Source.")

Source 1—Failed or fails—Source 1 is defined as "failed" when it is outside of its undervoltage or overvoltage or underfrequency or overfrequency (if applicable) set point ranges for the nominal voltage and frequency setting.

Source 2—Failed or fails—Source 2 is defined as "failed" when it is outside of its undervoltage or overvoltage or under-frequency or overfrequency (if applicable) set point ranges for the nominal voltage and frequency setting for a time exceeding 0.5 seconds after the time delay emergency fail (TDEF) time delay expires.

Transfer—"Transfer" is defined as a change of the load connection from the primary to secondary source except when specifically used as "Transfer to Neutral."

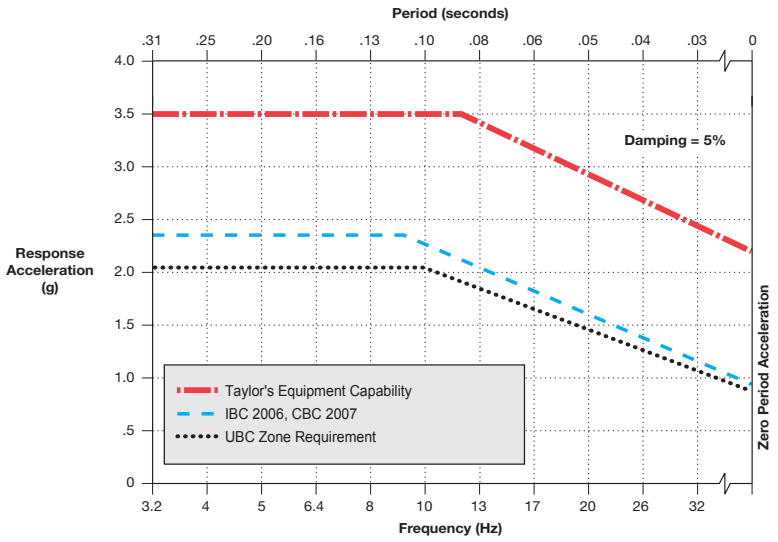
Transfer to Neutral—"Transfer to Neutral" is defined as when the load circuits are disconnected from both Source 1 and Source 2.

SEISMIC QUALIFIED

TEST CERTIFICATE OF SEISMIC WITHSTAND CAPABILITY

Taylor 's equipment identified below was tested for seismic withstand capability and tested in accordance with the combined requirements specified in the International Building Code, California Building Code and the Uniform Building Code. As required by the codes, the equipment demonstrated its ability to function after the seismic tests. The seismic capability of the equipment exceeds the worst-case required levels, as illustrated in the figure below.

UL 1008 Low Voltage Transfer Switches—Floor Mounted (Magnum DS Breakers and Contactor Type)



The frequency sweep tests revealed that the lowest equipment natural frequency is:

6.2 Hz

Mostafa A. Ahmed

3RD PARTY TEST ENGINEER IN CHARGE

TAYLOR POWER SYSTEMS ®