

Typical Automatic Transfer Switch diagrams



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- TRANSFER BETWEEN 2 SOURCES - 2 Bus bars	
- TRANSFER BETWEEN 2 SOURCES - 3 Bus bars	
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Standard ATS Diagrams

Purpose of the document

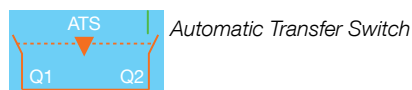
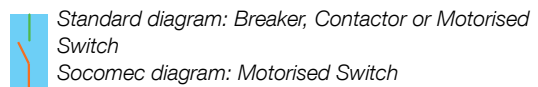
The purpose of this document is to propose a technical solution based on SOCOMEC motorised changeovers and switches to answer the greatest number of standard ATS diagrams made with others technologies.

Choosing the right changeover switch

Socomec changeover switches aim at ensuring ever more efficient ways to guarantee the continuity of distribution and, therefore, the rate of availability of your energy. Those changeover switches can be used not just for Normal/ Backup operation, but also for managing the switching of loads or the connection of equipment to earth. In addition to the rating and the related electrical breaking specifications, the selection criteria are:

- . type of control
- . installation constraints inside the enclosure...

Glossary

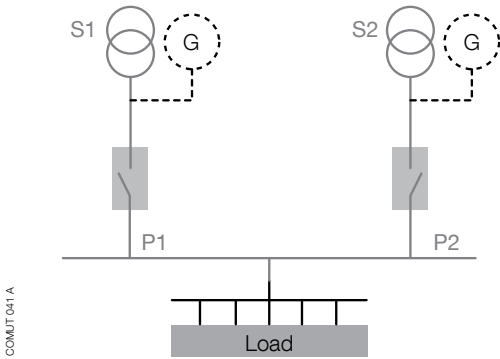


Standard Diagrams

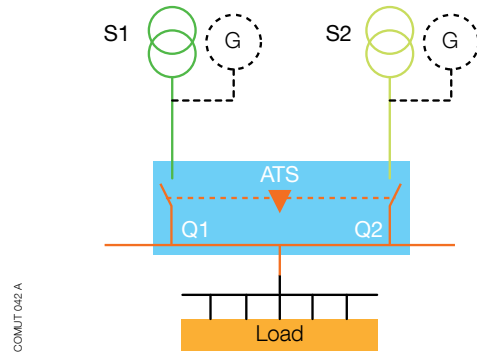
Transfer between 2 sources - 1 Bus bar

$$S1 \text{ (kVA)} = S2 \text{ (kVA)}$$

Standard solution



SOCOMEK solution



Operating table

S1	S2	STD	SOCOMEK	Load
0	0	X	X	Off
0	1	P2	Q2	On
1	0	P1	Q1	On
1	1	*	*	On

* Depending on networks priority

Socomec products

Mains/Mains – Mains/Gen :

- ATyS M6s or M6e, ATyS t, g or p



Gen/Gen

- ATyS M3s, ATyS or ATyS d, ATyS S + C40



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30



Advantage of Socomec solution

Operation

- Only one emergency handle
- Secured padlocking system

Implementation

- Only one product (built-in solution)
- Compacity
- Plug and play
- Mechanical and electrical interlocking are in build

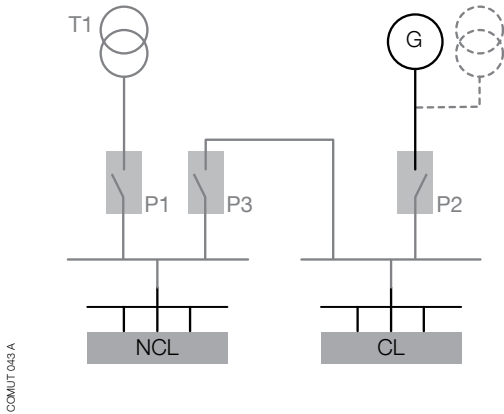
Standard Diagrams

Transfer between 2 sources - 2 Bus bars

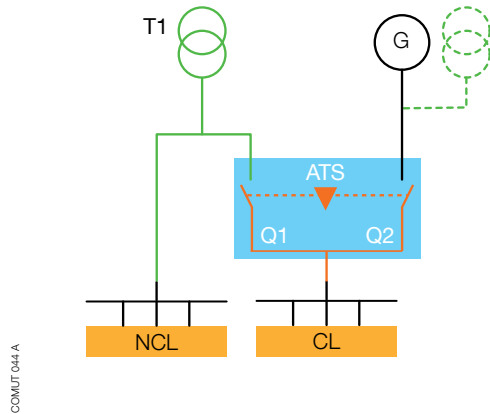
1) Sources are usually 1 transformer and 1 genset : loads are split between critical and non critical

First type of architecture : $S1 \text{ (kVA)} > SG \text{ (kVA)}$

Standard solution

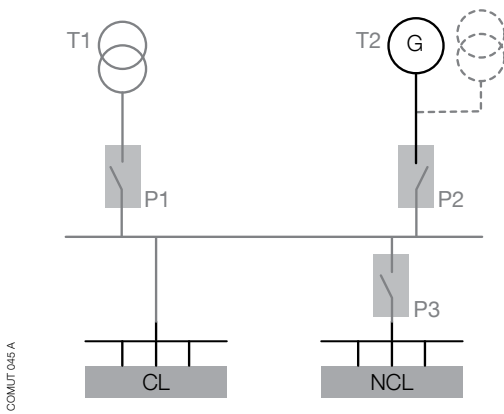


SOCOMEK solution

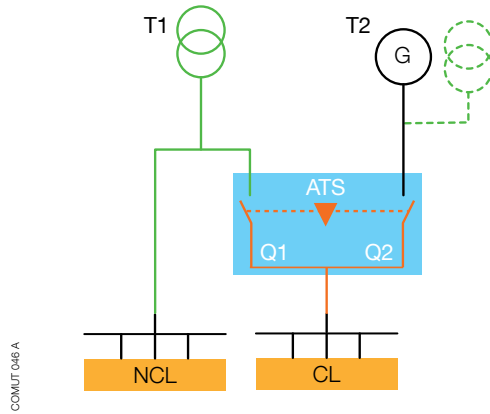


Second type of architecture : $S1 \text{ (kVA)} > S2 \text{ (kVA)}$

Standard solution



SOCOMEK solution



Operating table

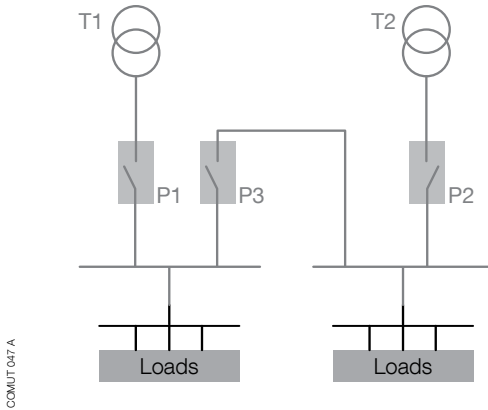
T1	G	STD	SOCOMEK	NCL	CL
0	0	X	X	Off	Off
0	1	P2	Q2	Off	On
1	0	P1 + P3	Q1	On	On

Transfer between 2 sources - 2 Bus bars (continued)

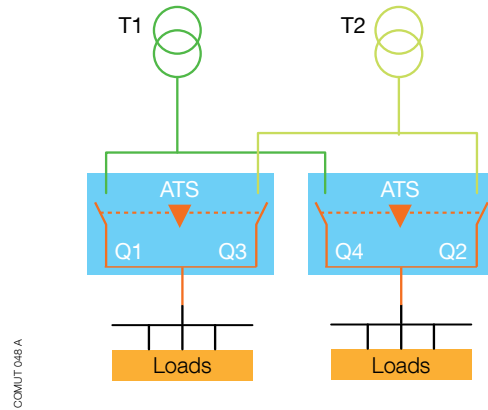
2) Sources are 2 transformers : loads aren't differentiated

$$S1 \text{ (kVA)} = S2 \text{ (kVA)}$$

Standard solution



SOCOMEK solution



Operating table

T1	T2	STD	SOCOMEK	L
0	0	X	X	Off
0	1	P2 + P3	Q2 + Q3	On
1	0	P1 + P3	Q1 + Q4	On
1	1	P1 + P2	Q1 + Q2	On

Socomec products

Mains/Mains – Mains/Gen :

- ATyS M6s or M6e, ATyS t, g or p

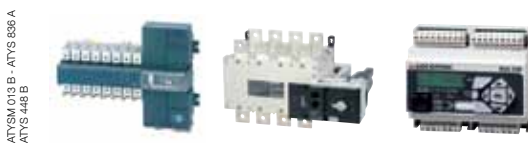


Motorised switch as option on Non Critical Loads

- SIRCO MOT AT



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30



Advantage of Socomec solution

Operation

- Only one emergency handle (2 in the last case)
- Secured padlocking system
- In the first case (between transformer and genset), a motorised switch can be added on the Non Critical Loads for optional disconnection

Implementation

- Fewer products
- Compacity (built -in solution)
- Plug and play
- Mechanical and electrical interlocking are in build.

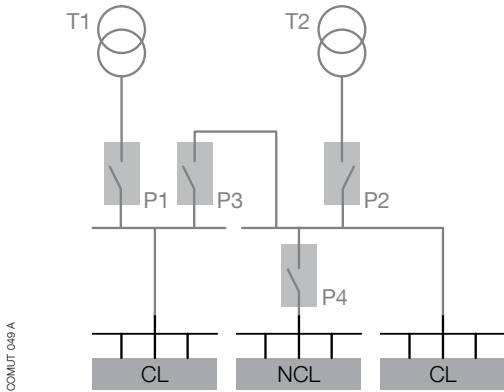
Standard Diagrams

Transfer between 2 sources - 3 Bus bars

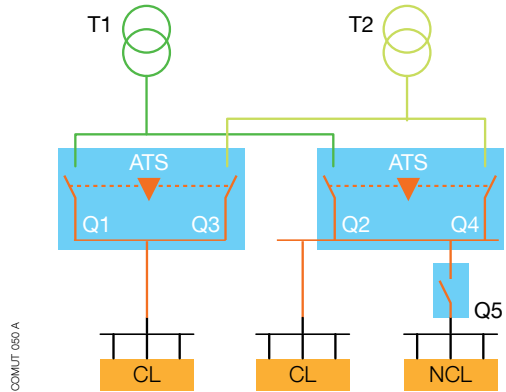
1) Sources are 2 transformers

$$S1 \text{ (kVA)} = S2 \text{ (kVA)}$$

Standard solution



SOCOMEK solution



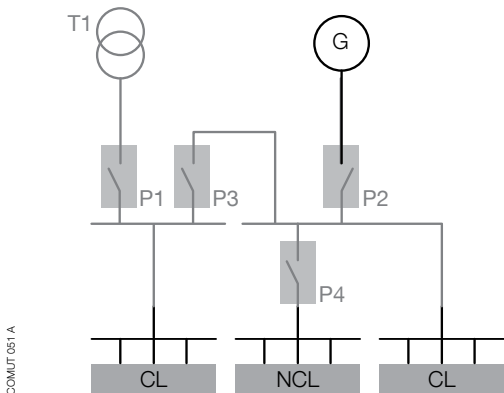
Operating table

T1	T2	STD	SOCOMEK	CL	NCL
0	0	X	X	Off	Off
0	1	P2 + P3	Q3 + Q4	On	Off
1	0	P1 + P3	Q1 + Q2	On	Off
1	1	P1 + P2 + P4	Q1 + Q4 + Q5	On	On

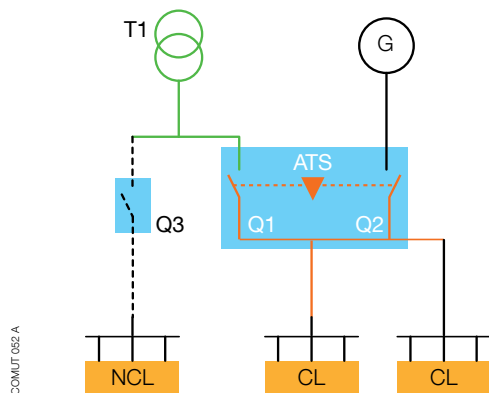
2) Sources are 1 transformer and 1 genset

$$S1 \text{ (kVA)} > S2 \text{ (kVA)}$$

Standard



SOCOMEK



Operating table

T1	T2	STD	SOCOMEK	CL	NCL
0	0	X	X	Off	Off
0	1	P2 + P3	Q2	On	Off
1	0	P1 + P3 + P4	Q1 + Q3	On	On

Transfer between 2 sources - 3 Bus bars (continued)

Socomec products

Mains/Mains – Mains/Gen :

- ATyS M6s or M6e, ATyS t, p, g

ATYSM 007 A - ATYS 1001 A



Motorised switch as option on Non Critical Loads

- SIRCO MOT AT

SIRCO 310 B



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30

ATYSM 013 B - ATYS 808 A
ATYS 448 B



Advantage of Socomec solution

Operation

- Only 2 or 3 emergency handles instead of 4
- Redundancy of P3
- Secured padlocking system
- In the second case (between transformer and genset), a motorized switch can be added on the Critical Loads for optional disconnection

Implementation

- Fewer products
- Compactness (built-in solution)
- Plug and play
- Mechanical and electrical interlocking are in build

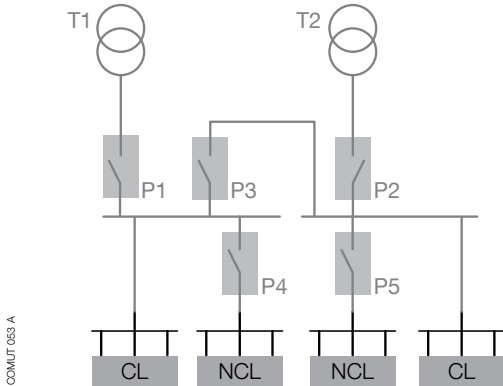
Standard Diagrams

Transfer between 2 sources - 4 Bus bars

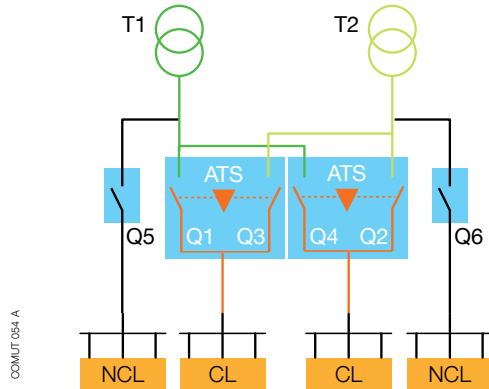
1) Sources are 2 transformers

S1 (kVA) = S2 (kVA)

Standard solution



SOCOMEC solution



Operating table

T1	T2	STD	SOCOMEC	CL	NCL
0	0	X	X	Off	Off
0	1	P2 + P3	Q2 + Q3	On	Off
1	0	P1 + P3	Q1 + Q4	On	Off
1	1	P1 + P2 + P4 + P5	Q1 + Q2 + Q5 + Q6	On	On

Socomec products

Mains/Mains – Mains/Gen :

- ATyS M6s or M6e, ATyS t, g or p



Motorised switch as option on Non Critical Loads

- SIRCO MOT AT



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30



Advantage of Socomec solution

Operation

- Only 4 emergency handles instead of 5
- Redundancy of P3
- Secured padlocking system

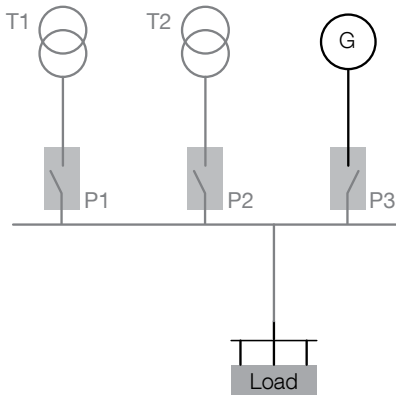
Implementation

- Fewer products
- Compactness (built-in solution)
- Plug and play
- Mechanical and electrical interlocking are in build

Transfer between 3 sources - 1 Bus bar

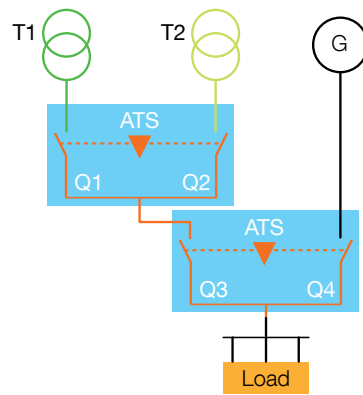
$$S1 \text{ (kVA)} = S2 \text{ (kVA)} = SG \text{ (kVA)}$$

Standard solution



COMJUT 055 A

SOCOMEK solution



COMJUT 056 A

Operating table

Standard

T1	T2	G	STD	SOCOMEK	Load
0	0	0	X	X	Off
1	0	0	P1	Q1 + Q3	On
0	1	0	P2	Q2 + Q3	On
0	0	1	P3	Q4	On

Socomec products

Mains/Mains – Mains/Gen :

- ATyS M6s or M6e, ATyS t, g or p

ATYSM 007 A - ATYS 1 001 A



Gen/Gen

- ATyS M3s, ATyS or ATyS d, ATyS S + C40

ATYSM 013 B - ATYS 836 A
ATYS 448 B



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30

ATYSM 013 B - ATYS 836 A
ATYS 448 B



Advantage of Socomec solution

Operation

- Only 2 emergency handles instead of 3
- Secured padlocking system

Implementation

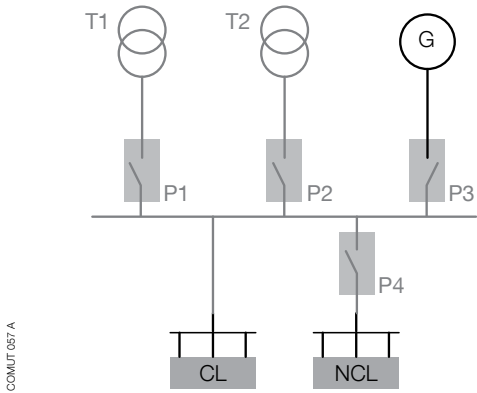
- Compactness (built-in solution)
- Plug and play
- Mechanical and electrical interlocking are in build

Standard Diagrams

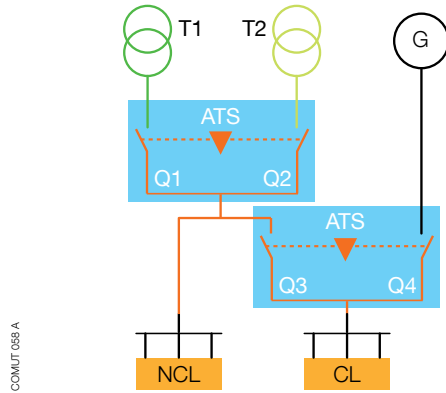
Transfer between 3 sources - 2 Bus bars

First type of architecture : $S1 \text{ (kVA)} = S2 \text{ (kVA)} > SG \text{ (kVA)}$

Standard solution

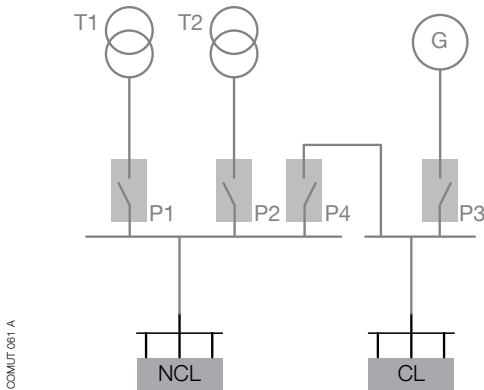


SOCOMEK solution

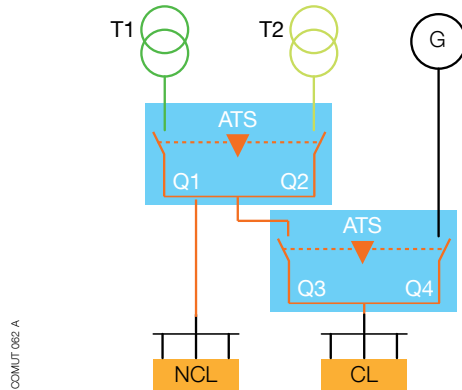


Second type of architecture : $S1 \text{ (kVA)} = S2 \text{ (kVA)} > SG \text{ (kVA)}$

Standard solution



SOCOMEK solution



Operating table

T1	T2	G	STD	SOCOMEK	CL	NCL
0	0	0	X	X	Off	Off
1	0	0	P1 + P4	Q1 + Q3	On	On
0	1	0	P2 + P4	Q2 + Q3	On	On
0	0	1	P3	Q4	On	Off

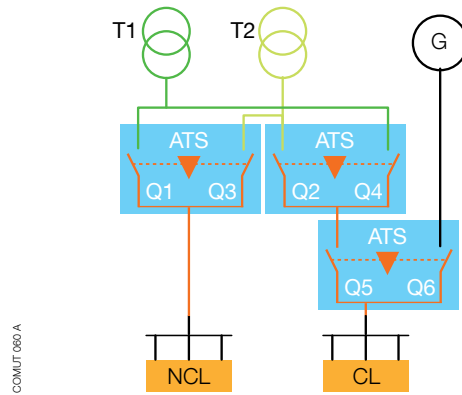
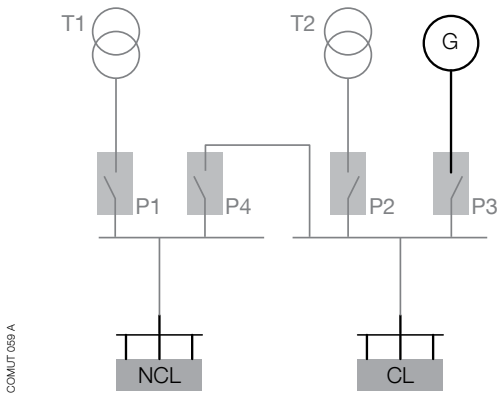
Loads legend : C: Critical - NCL: Non Critical

Transfer between 3 sources - 2 Bus bars (continued)

Third type of architecture : $S1 \text{ (kVA)} = S2 \text{ (kVA)} > SG \text{ (kVA)}$

Standard

SOCOMECS



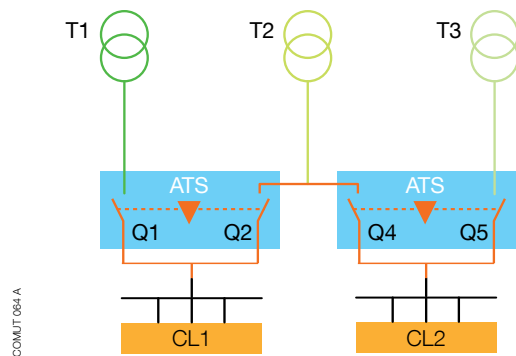
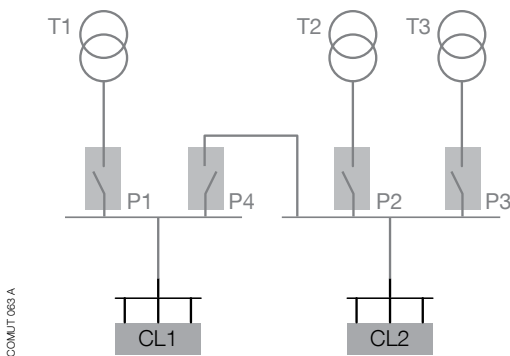
Operating table

T1	T2	G	STD	SOCOMECS	CL	NCL
0	0	0	X	X	Off	Off
1	0	0	P1 + P4	Q1 + Q4 + Q5	On	On
0	1	0	P2 + P4	Q3 + Q2 + Q5	On	On
0	0	1	P3	Q6	On	Off
1	1	0	P1 + P2	Q1 + Q2 + Q5	On	On

Fourth type of architecture : $S2 \text{ (kVA)} > S1 \text{ (kVA)}$ and $S2 \text{ (kVA)} > S3 \text{ (kVA)}$

Standard solution

SOCOMECS solution



Operating table

T1	T2	T3	STD	SOCOMECS	CL1	CL2
0	0	0	X	X	Off	Off
1	0	0	P1	Q1	On	Off
0	1	0	P2 + P4	Q2 + Q4	On	On
0	0	1	P3	Q5	Off	On
1	0	1	P1 + P3	Q5 + Q1	On	On

Standard Diagrams

Transfer between 3 sources - 2 Bus bars (continued)

Socomec products

Mains/Mains – Mains/Gen

- ATyS M6s or M6, ATyS t, g or p

ATYSM007 A - ATYS1001 A



Motorised switch as option on Non Critical Loads

- SIRCO MOT AT

SIRCO 310 B



- ATyS M3s, ATyS or ATyS d, ATyS S + C20 or C30

ATYSM013 B - ATYS 838 A
ATYS 448 B



Advantage of Socomec solution

Operation

- Only 2 or 3 emergency handles instead of 4 or 5
- A motorized switch can be added on the Non Critical Loads for optional disconnection
- Secured padlocking system

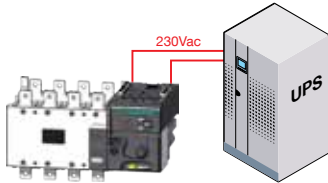
Implementation

- Compacity (built -in solution)
- Plug and play
- Mechanical and electrical interlocking are in build

ATyS and ATyS M benefits

Changeover Systems: SOCOMEC technologies Benefits, fully compliant with IEC 60947-6-1

- Power supply taken from an existing UPS



ATyS 620 A

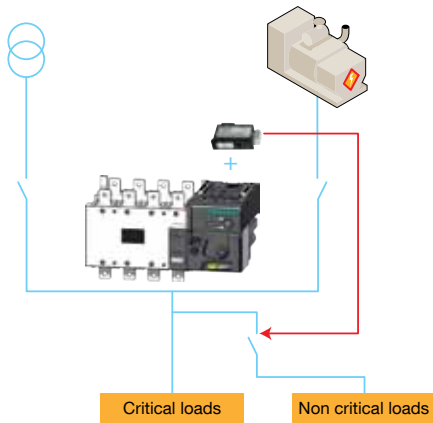
- Inherently double throw switch for low voltage applications



ATyS M 038 A

- Load shedding principle diagram:

ATyS p associated to an Input/Output Module can deliver a signal to the motorised switch in order to realise the load shedding.



ATyS 821 A

- Secured disconnection integrated for load isolation thanks to a double switching technology per pole with fully visualized breaking.

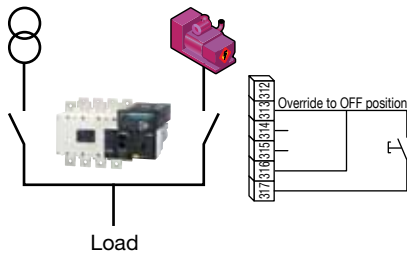
- High number of operations according to IEC 60947-6-1.

- On load Making & Breaking capacity



ATyS 502 A

- Emergency stop on ATyS

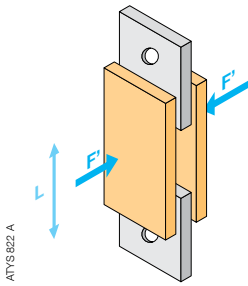


catloc_274_a_gb - catloc_275_a_gb

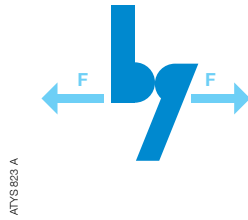
ATyS and ATyS M benefits

Changeover Systems : SOCOMEC technologies Benefits, fully Compliant with IEC-60947-6-1

- **Constant pressure** on the contacts not affected by voltage variations, vibrations or repulsive force during short-circuits.



ATyS 8822 A
SOCOMEC sliding contacts



ATyS 8823 A
Contactors & Circuit breakers

- **Integrated Mechanical and Electrical Interlocking system.**



atysem_239_A

- **Silver plated & Self cleaning contacts.** Maintenance free, No inspection & replacement needed.
- **High dynamic short circuit withstand** (result after 10 short-circuits).



caltec_2772_a

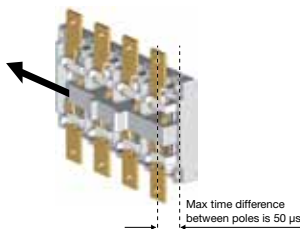


caltec_2773_b



atyS_239B_A

- **Synchronised neutral closing.** The neutral contact is fitted on the same moving contact bar. Ensure neutral referencing & avoid surges.



sico_445_a_1_gd_cat

All the big brands are using the synchronised neutral closing technology...

- **The electric mechanism is a single operator** momentarily energized.

- **Stable positions** not affected by voltage fluctuations & vibrations.

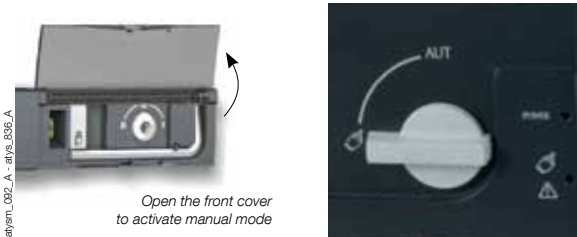


- **Product not powered in stable positions.** Operator is a momentarily energized mechanism. No consumption & extended operating life.

- **Neutral is fully rated** in comparison with phases contacts.
- **Fully rated** : In order to avoid inrush currents in case of motor load.

Changeover Systems : SOCOMEC technologies Benefits, fully Compliant with IEC-60947-6-1

- **Operating mode selector** (Auto / Manual) with interlocking.



Handle housing not possible in Auto mode to secure manual operation.

- **Built-in Mechanical Padlocking System** in manual mode in 0 position (3 positions on request).

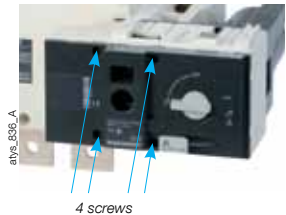


Auto & Manual mode are disabled and not possible in padlocked Mode.

- **Emergency manual operation facilities** with a single handle.



- **Ease of maintenance:**
Motor & Control relay can be replaced on load = no power loss!
During maintenance operations, changeover is always possible manually.



SOCOMEK Products Range

Manual Changeover (MTSE)

como 107 A - scom 124 A - sircov 138 A - sircov 137/133 A



COMO C

Commut SIRCO M

Commut SIRCO VM1

SIRCOVER

SIRCOVER By-Pass

SIRCOVER ATS By-Pass

Motorised changeover (RTSE) & Automatic (ATSE)

atys 001 A - atys 836 A - atys 4001 A
atys 001 A - atys 1001 A - atys 1001 A
atysm 019 B - atysm 12 A - atysm 159 A



ATyS M 3s

ATyS M 6s

ATyS M 6e

ATyS s

ATyS

ATyS d

ATyS t

ATyS g

ATyS p

Controller and interfaces

atys 612 B - atys 453 B - atys 450 A - atys 599 C
atys 594 C - atys 595 C



DPS

C20

C30

C40

D10

D10

Enclosed solutions

coff 298 B - coff 335 A - coff 306 B - habco 032 A



SIRCOVER

ATyS M

ATyS

By-Pass

ATS By-Pass Systems, SOCOMEC solution

Generalities

- The ATS By-Pass function is a solution which allows on normal/emergency changeover installation to isolate the Automatic Transfer Switch Equipment (ATSE) during the maintenance periods, & keep the power supply availability for the installation.
- The ATSE, which is subject on high number of operations and risks of damages (lightning, high voltage fluctuation) due to the permanent connection to the mains, can be controlled or replaced without any threat for the operator and without affecting the continuity of the power supply.

186b 023 A



186b 028 A



ATS By-Pass Systems, SOCOMEC solution

Functions & Compositions

SOCOMECC can provide a complete enclosed range Single or Double Line

	Single Line				Double line				
Range from 40A to 3200A									
Switching Equipments	FUNCTIONS	Qties	40 A to 125 A	250 A to 3200 A	FUNCTIONS	Qties	40 A to 125 A	250 A to 3200 A	
	ATS Automatic Transfer Switch	1	ATyS M 6e 	ATyS p 	ATS Automatic Transfer Switch	1	ATyS M 6e 	ATyS p 	
	LBS Load Break Switch	1	SIRCO M 8P 	SIRCO 8P 	LBS Load Break Switch	1	SIRCO M 8P 	SIRCO 8P 	
	MTS Manual Transfer Switch	1	SIRCO M 	SIRCOVER 	MTS Manual Transfer Switch	2	SIRCO M 	SIRCOVER 	
HMI Human Machine Interface	1	Mimic Diagram + ATyS D20 	Mimic Diagram + ATyS D20 	HMI Human Machine Interface	1	Mimic Diagram + ATyS D20 	Mimic Diagram + ATyS D20 		
References	RATINGS	POLES	REFERENCES	RATINGS	POLES	REFERENCES	RATINGS	POLES	REFERENCES
	40 A	4P	1785 4004	40 A	4P	1786 4004	40 A	4P	1786 4004
	63 A	4P	1785 4006	63 A	4P	1786 4006	63 A	4P	1786 4006
	80 A	4P	1785 4008	80 A	4P	1786 4008	80 A	4P	1786 4008
	100 A	4P	1785 4010	100 A	4P	1786 4010	100 A	4P	1786 4010
	125 A	4P	1785 4012	125 A	4P	1786 4012	125 A	4P	1786 4012
	160 A	4P	1785 4016	160 A	4P	1786 4016	160 A	4P	1786 4016
	250 A	4P	1785 4025	250 A	4P	1786 4025	250 A	4P	1786 4025
	400 A	4P	1785 4040	400 A	4P	1786 4040	400 A	4P	1786 4040
	630 A	4P	1785 4063	630 A	4P	1786 4063	630 A	4P	1786 4063
	800 A	4P	1785 4080	800 A	4P	1786 4080	800 A	4P	1786 4080
	1000 A	4P	1785 4100	1000 A	4P	1786 4100	1000 A	4P	1786 4100
	1250 A	4P	1785 4120	1250 A	4P	1786 4120	1250 A	4P	1786 4120
	1600 A	4P	1785 4160	1600 A	4P	1786 4160	1600 A	4P	1786 4160
2000 A	4P	1785 4200	2000 A	4P	1786 4200	2000 A	4P	1786 4200	
2500 A	4P	1785 4250	2500 A	4P	1786 4250	2500 A	4P	1786 4250	
3200 A	4P	1785 4320	3200 A	4P	1786 4320	3200 A	4P	1786 4320	

Changeover Systems : Applications

Markets

Tertiary sector / Building

- High Rise Buildings & Public Buildings.
- Hospitals (Surgery, Intensive cars, Hospitalisation, ...).
- Computer rooms (Data centre, Banks, Insurances, Hosting, ...).
- Shopping centres.

Infrastructures

- Airports (navigation, signalisation, ...).
- Commercial and military navy.
- Highways (Tunnels, tolls, ...).
- Railways.
- Telecom.

Industry

- Power production.
- Continuous process.
- OEM.



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