

TYPE C TL & TPL SWITCHES



CONTROL AND SIGNALING SOLUTIONS FOR HARSH ENVIRONMENTS



TYPE C TL & TPL SWITCHES



Robust

Long life durability :

- A reliability recognized for more than 40 years
- Qualified according to nuclear standards IEEE 323 & 344
- A foolproof mechanical and electrical robustness
- Applications in harsh environments

Configurable

Adaptable to your applications :

- Very numerous available functions:
 - Turn Light
 - Turn-Push Light
 - Turn-Push-Turn Light
- TL, up to 30 Turn contacts. TPL, up to 20 Turn contacts and 8 Push contacts on the same device.
- Many kinds of handles, signaling socket, etc., many possibilities of special functions and diagrams
- The richest TPL offer on the market

APPLICATION

> Control and signaling of isolator and circuit breakers

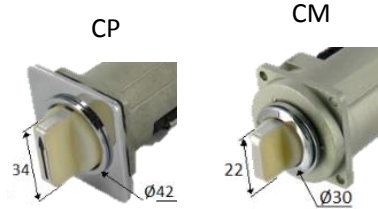
- These switches have a particularly strong design which allows them very numerous applications in severe environments (shocks, vibrations, temperature, radiations, earthquakes).
- This range of product is a reference for more than 40 years in control room of nuclear power plants worldwide. It also equips very numerous electrical distribution plants and railways electrical dispatch.
- This range allows to realize all your functions of discrepancy switches for control and signaling of ground isolators and circuit breakers. This range allows also to control contactors, valves circuits, etc. or all your control sequence that requires information feedback by light in order to secure people or equipments.

Codification of products

Types / Special assembly / Contacts ans scheme / Accessories / Signaling and lamps / Handle type / Key number /Escutcheon plate or special accessories //
 Eg : CM5 / - / F1-O1+F1+F1+70077 / 70X45+PD / E14+48V / MF / - / SCC //

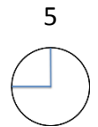
Types

- CP** Switch with handle Ø34 (Drilling Ø39)
- CM** Switch with handle Ø22 (Drilling Ø27,5)
- 5** Type of switch is followed by the function number.
 Eg : function 5 = TPL 2 fixed positions (9h-12h)
(Cf. currently used diagrams, function numbers tables)



Special assembly

- C50** Product equipped with a special front part which allow to install it on our mosaic panel □50.
 We have also the possibility to realize a special assembly in order to install the product on mosaic panel □48
- ESN** Black central nut *(in replacement of the standard chromed central nut)*



C50



ESN



Contacts and scheme

Example of reference constuction

- F1-O1** Turn function contact configuration
- F1** Push function contact configuration in initial position
- F1** Push function contact configuration in second position
- 70077** MAFELEC scheme number corresponding this function

(not used in case of non-selected contacts)

F1-O1+F1+F1+70077

F : Number of normally open contacts (NO)
 O : Number of normally close contacts (NC)

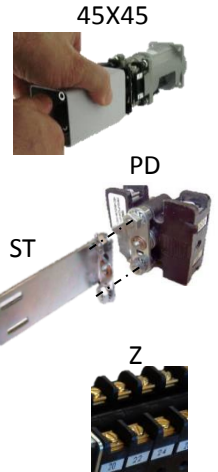
POSITIONS	TOURNER		POUS SER	
	20 020	21 021	01 1	02 2
1		X		F
3		X		F

Codification of products

Types / Special assembly / Contacts ans scheme / Accessories / Signaling and lamps / Handle type / Key number / Escutcheon plate or special accessories //
 Eg : CMS / - / F1-O1+F1+F1+70077 / 70X45+PD / E14+48V / MF / - / SCC //

Accessories

- 45X45 or 70X45** Plastic contacts cover (Included in standard)
Dimension 45X45 up to 8 contacts and 70X45 beyond
- PD** Rear plate cutted to allow rear cable outlet *(Included in standard)*
- ST** Metallic cable support for rear cable outlet
- CF** Protective cover split on one side to allow an easy placement after wiring
- Z** Use of contacts in alloy Gold-Silver in replacement of contacts in alloy Silver/Nickel
(Recommended for low current level applications)



Signaling and lamps

- Non-illuminated product or non-equipped with a lamp socket
- E10 or E14 or BA9S** Product equipped with an E10 socket for 1 lamp
Product equipped with a E14 socket for 1 lamp
Product equipped with a BA9S socket for 2 lamps (1 common point)
- 48V or LED48V** The voltage indicated in complement of socket type mean that the product will be supplied with a filament lamp working in this nominal voltage.
The indication LED before the voltage mean that the product will be supplied with a white LED lamp working in this nominal voltage.
(products can be equipped with filaments lamps, white or colored LED lamps, for most common AC/DC nominal voltage)



Codification of products

Types / Special assembly / Contacts ans scheme / Accessories / Signaling and lamps / Handle type / Key number / Escutcheon plate or special accessories //

Eg : CM5 / - / F1-O1+F1+F1+70077 / 70X45+PD / E14+48V / MF / - / - / SCC //

Handle type

M	Translucent white handle without arrow
MF	Translucent white handle with arrow Other handle colors on request (MR : Red ; MN : Black ; MV : Green; MJ : Yellow; MBU: Blue...)
TN	In complement of the handle it indicate that the strip will be black instead of the standard chromed strip (<i>often associated with ESN</i>)



Key number

This part of codification is not used, It concerns only key command switches

Escutcheon plate and accessories

SCC	Square chromed symbol (for circuit breaker) : □45 for CP and □32 for CM
SCN	Square black symbol (for circuit breaker) : □45 for CP and □32 for CM
SRC	Round chromed symbol (for isolator) : Ø44 for CP and Ø32 for CM
SRN	Round black symbol (for isolator) : Ø44 for CP and Ø32 for CM
PCC	Square chromed escutcheon (for engraving) : □58 for CP and □42 for CM
PRC	Round chromed escutcheon (for engraving) : Ø54 for CP and Ø32 for CM
G	« G » in complement of PCC or PRC indicate that product is engraved (<i>symbols cannot be engraved</i>) <i>Possibility of engraving on request</i>



Currently used diagrams

Turn Light



- **Function 4** : 2 fixed positions at 90° or 45°

CM4 or CP4.../F1-O1+73160/ ...

POSITIONS	TOURNER	
	20 020	21 021
1		X
3		X

CM4 or CP4.../F2-O2+73160/ ...

POSITIONS	TOURNER			
	20 020	21 021	22 022	23 023
1		X	X	X
3		X	X	

CM4 or CP4.../F3-O3+73160/ ...

POSITIONS	TOURNER					
	20 020	21 021	22 022	23 023	24 024	25 025
1		X	X	X	X	X
3		X	X	X	X	

CM4 or CP4.../F3-O3+73363/ ...

POSITIONS	TOURNER					
	20 020	21 021	22 022	23 023	24 024	25 025
3		X	X	X	X	
4		X	X	X	X	

CM4 or CP4.../F8-O8+75992/ ...

POSITIONS	TOURNER															
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029	30 030	31 031	32 032	33 033	34 034	35 035
2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	

i We are able to realize all others diagrams on request in the limit of 20 Turn contacts for CM switches and 30 Turn contacts for CP switches.

We can realize your 2 positions switch (function 4) for the positioning variants below :



Function 1 is the corresponding function without light (*product is not equipped with lamp socket*)

Currently used diagrams

Turn Light

- **Functions 162A and 162B : 1 fixed position + 1 impulse position at 90° or 45°**

CM162A or CP162A.../76709/ ...

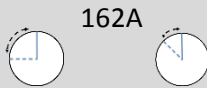
POSITIONS	TOURNER	
	20 020	21 021
1 i		X X
3		

CM162B or CP162B.../CM21215/ ...

POSITIONS	TOURNER	
	20 020	21 021
3		X
4 i		X

i We are able to realize all others diagrams on request in the limit of 10 Turn contacts

We can realize your switch for the positioning variants below :



Functions 16A and 16B are the corresponding function without light (*product is not equipped with lamp socket*)

- **Function 32 : 3 fixed positions at 90° or 45°**

CM32 or CP32.../80532/ ...

POSITIONS	TOURNER							
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027
1		X	X	X	X			X
3		X	X	X			X	
5			X	X	X		X	

CM32 or CP32.../CM20787/ ...

POSITIONS	TOURNER													
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029	30 030	31 031	32 032	33 033
1		X	X		X	X			X	X				
3				X	X			X	X			X	X	
5													X	X

i We are able to realize all others diagrams on request in the limit of 20 Turn contacts for CM switches and 30 Turn contacts for CP switches.

We can realize your 3 positions switch (function 32) for the positioning variants below :



Function 31 is the corresponding function without light (*product is not equipped with lamp socket*)

Currently used diagrams

Turn Light

- **Functions 326A and 326B** : 2 fixed positions at 90° or 45° + 1 impulse position at 45°

CM326A or CP326A.../74155/ ...

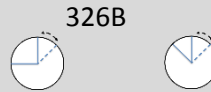
POSITIONS	TOURNER	
	20 020	21 021
2 i		X
3		
5		X

CM326B or CP326B.../75865/ ...

POSITIONS	TOURNER	
	20 020	21 021
2		
3		X
4 i		X X

i We are able to realize all others diagrams on request in the limit of 10 Turn contacts

We can realize your switch for the positioning variants below :



Functions 316A and 316B are the corresponding function without light (*product is not equipped with lamp socket*)

- **Function 362** : 1 fixed position + 2 impulse positions at 90° or 45°

CM362 or CP362.../77847/ ...

POSITIONS	TOURNER			
	20 020	21 021	22 022	23 023
2 i		X	X	
3		X		X
4 i			X	X

CM362 or CP362.../F3-O3+81129/ ...

POSITIONS	TOURNER					
	20 020	21 021	22 022	23 023	24 024	25 025
2 i		X		X	X	
3						
4 i			X	X		X

i We are able to realize all others diagrams on request in the limit of 10 Turn contacts

We can realize your switch (function 362) for the positioning variants below :



Function 36 is the corresponding function without light (*product is not equipped with lamp socket*)

Currently used diagrams

Turn Light

- **Function 44 : 4 fixed positions at 45°**

CM44 or CP44.../71609/ ...

POSITIONS		TOURNER							
		20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027
1		X			X		X		X
2			X	X			X		X
3			X		X	X			X
4			X		X		X	X	

i We are able to realize all others diagrams on request in the limit of 20 Turn contacts for CM switches and 30 Turn contacts for CP switches.
Function 41 is the corresponding function without light (*product is not equipped with lamp socket*)

- **Function 52 : 5 fixed positions at 45°**

CM52 or CP52.../79768/ ...

POSITIONS		TOURNER					
		20 020	21 021	22 022	23 023	24 024	25 025
1			X				
2		X					
3					X		
4				X			
5						X	X

i We are able to realize all others diagrams on request in the limit of 20 Turn contacts for CM switches and 30 Turn contacts for CP switches.
Function 51 is the corresponding function without light (*product is not equipped with lamp socket*)

We are able to realize non illuminated turn switches :

- 6 fixed positions (function 61) or 7 fixed positions (function 71) or 8 fixed positions (function 81)

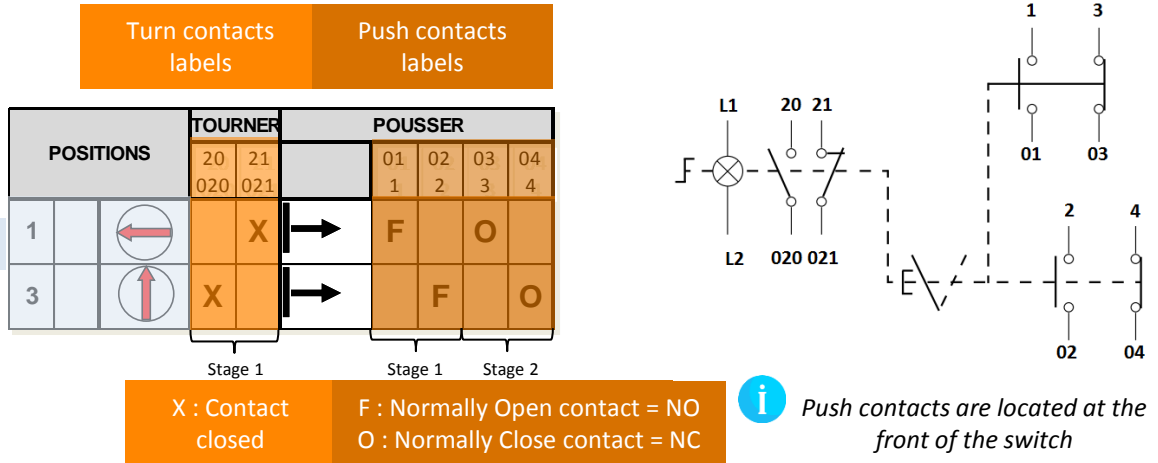


Currently used diagrams

Turn Push Light

Example of realization of TPL switch with 2 fixed positions at 90° :

- 1 Turn contact close per positions
- 1 Push contact close per positions + 1 Push contact open per positions (push selected contacts)



▪ **Function 5 : 2 fixed positions at 90°**

CM5 or CP5 .../F1-O1+F1+F1+70077/ ...

		TOURNER		POUSSER	
POSITIONS		20 020	21 021	01 1	02 2
1		X		F	
3		X		F	

CM5 or CP5 .../F1-O1+O1+F1+70079/ ...

		TOURNER		POUSSER		
POSITIONS		20 020	21 021	02 2	03 3	
1		X		F		
3		X			O	

CM5 or CP5.../F1-O1+F1-O1+F1-O1+70023/ ...

		TOURNER		POUSSER			
POSITIONS		20 020	21 021	01 1	02 2	03 3	04 4
1		X		F		O	
3		X		F		O	

CM5 or CP5.../F1-O1+F2+F2+70108/ ...

		TOURNER		POUSSER					
POSITIONS		20 020	21 021	01 1	02 2	05 5	06 6		
1		X		F	F				
3		X		F	F				

CM5 or CP5.../F1-O1+F1-O2+F1-O2+81754/ ...

		TOURNER		POUSSER					
POSITIONS		20 020	21 021	01 1	02 2	03 3	04 4	05 5	06 6
1		X		F	O			O	
3		X		F	O			O	

Currently used diagrams

Turn Push Light

- **Function 5 : 2 fixed positions at 90°**

CM5 or CP5.../F2-O2+F1+F1+70133/ ...

POSITIONS	TOURNER				POUSSER	
	20 020	21 021	22 022	23 023	01 1	02 2
1		X	X		F	
3		X	X			F

CM5 or CP5.../F2-O2+F2+F2+70027/ ...

POSITIONS	TOURNER				POUSSER			
	20 020	21 021	22 022	23 023	01 1	02 2	05 5	06 6
1		X	X		F		F	
3		X	X				F	F

CM5 or CP5.../F2-O2+F1-O1+F1-O1+70106/ ...

POSITIONS	TOURNER				POUSSER			
	20 020	21 021	22 022	23 023	01 1	02 2	03 3	04 4
1		X	X		F		O	
3		X	X				F	O

CM5 or CP5.../F2-O2+F2-O2+F2-O2+80219...

POSITIONS	TOURNER				POUSSER							
	20 020	21 021	22 022	23 023	01 1	02 2	03 3	04 4	05 5	06 6	07 7	08 8
1		X	X		F		O		F		O	
3			X	X			F		O		F	O

CM5 or CP5.../F2-O2+F3+F3+70943/ ...

POSITIONS	TOURNER				POUSSER					
	20 020	21 021	22 022	23 023	01 1	02 2	05 5	06 6	09 9	10 10
1		X	X		F			F		F
3		X	X			F			F	F

CM5 or CP5.../F3-O3+F1-O1+F1-O1+70024/ ...

POSITIONS	TOURNER					POUSSER				
	20 020	21 021	22 022	23 023	24 024	25 025	01 1	02 2	03 3	04 4
1		X	X	X			F		O	
3		X	X	X				F		O

CM5 or CP5.../F3-O3+F2-O1+F2-O1+79033/...

POSITIONS	TOURNER					POUSSER						
	20 020	21 021	22 022	23 023	24 024	25 025	01 1	02 2	03 3	04 4	05 5	06 6
1		X	X		X		F		O		F	
3		X		X	X				F		O	F



We are able to realize all others diagrams on request in the limit of 8 non-selected Push contacts or 6 selected Push contacts and 10 Turn contacts.

Currently used diagrams

Turn Push Light

- **Function 17** : 3 fixed positions at 90° or 45°

CM17 or CP17.../80230/ ...

POSITIONS		TOURNER							POUSSER					
		20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027		01 1	02 2	05 5	06 6
1			X	X				X	→	F	F	F	F	
3		X			X		X		→	F	F	F	F	
5				X		X			→	F	F	F	F	

CM17 or CP17.../84427/ ...

POSITIONS		TOURNER						POUSSER				
		20 020	21 021	22 022	25 025	26 026	27 027		01 1	02 2	05 5	
1			X				X	→	F	F		
3		X				X		→	F	F		
5				X	X			→		F		

CM17 or CP17.../72769/ ...

POSITIONS		TOURNER		POUSSER	
		20 020	21 021	01 1	02 2
2		X		→	F
3				→	
4			X	→	F

CM17 or CP17.../83098/ ...

POSITIONS		TOURNER										POUSSER			
		20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029		01 1	02 2	03 3
1				X	X							→	F	F	O
3			X		X	X	X	X				→	F	F	O
5		X	X			X			X	X		→	F	F	O

i We are able to realize all others diagrams on request in the limit of 8 non-selected Push contacts or 6 selected Push contacts and 10 Turn contacts.

We can realize your 3 positions switch (function 17) for the positioning variants below :



Currently used diagrams

Turn Push Light

- **Function 47 : 4 fixed positions at 45°**

CM47 or CP47.../82397/ ...

POSITIONS	TOURNER							POUSSER					
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	01 1	02 2	03 3	04 4	
1		X			X				→	F	F	F	F
2			X			X			→	F	F	F	F
3				X			X		→	F	F	F	F
4				X				X	→	F	F	F	F

CM47 or CP47.../83100/ ...

POSITIONS	TOURNER											POUSSER					
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029	30 030	31 031	01 1	02 2	03 3	05 5	
1		X		X	X	X		X					→	F	F	O	F
2							X						→	F	F	O	F
3			X	X				X	X	X			→	F	F	O	F
4		X		X				X			X	X	→	F	F	O	F

CM47 or CP47.../82829/ ...

POSITIONS	TOURNER									POUSSER				
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029	01 1	02 2	05 5	
1		X				X	X			X	→	F	F	F
2			X	X			X				→	F	F	F
3					X			X			→	F	F	F
4		X							X		→	F	F	F

i We are able to realize all others diagrams on request in the limit of 8 non-selected Push contacts or 6 selected Push contacts and 10 Turn contacts.

We can realize your 4 positions switch (function 47) for the positioning variants below :



Currently used diagrams

Turn Push Light

- **Function 42 : 5 fixed positions at 45°**

CM42 or CP42.../70090/ ...

POSITIONS	TOURNER					POUSSER	
	20 020	21 021	22 022	23 023		01 1	02 2
1		X	X			→	
2						→	
3				X		→	F F
4			X			→	F F
5						→	

CM42 or CP42.../74276/ ...

POSITIONS	TOURNER					POUSSER		
	20 020	21 021	22 022	23 023	24 024	25 025	01 1	02 2
1		X			X		→	F F
2			X			X	→	F F
3				X			→	F F
4			X				→	F F
5							→	

CM42 or CP42.../83191/ ...

POSITIONS	TOURNER							POUSSER		
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	01 1	02 2
1			X						→	
2				X					→	
3		X				X			→	F F
4		X			X				→	F F
5							X	X	→	

CM42 or CP42.../73771/ ...

POSITIONS	TOURNER									POUSSER		
	20 020	21 021	22 022	23 023	24 024	25 025	26 026	27 027	28 028	29 029	01 1	
1		X	X								→	F
2				X	X						→	F
3					X	X					→	F
4							X	X			→	F
5									X	X	→	F

i We are able to realize all others diagrams on request in the limit of 8 non-selected Push contacts or 6 selected Push contacts and 10 Turn contacts.

We are able to realize non illuminated turn switches :

- 6 fixed positions (function 66) or 7 fixed positions (function 76) or 8 fixed positions (function 86)



Currently used diagrams

Turn Push Turn Light

- **Function S55** : 2 fixed positions at 90° : 1 and 3 + 2 positions at impulsion at 45° : 4 and 8.
You must Push to Turn to go from position 1 to 8 or 3 to 4.



CMS55 or CPS55.../71208/...

POSITIONS	TOURNER			
	20 020	21 021	22 022	23 023
1		X		
8 i		X	X	
3			X	
4 i			X	X

CMS55 or CPS55.../83971/...

POSITIONS	TOURNER			
	20 020	21 021	22 022	23 023
1				
8 i		X	X	
3				
4 i			X	X

CMS55 or CPS55.../74957/...

POSITIONS	TOURNER				
	20 020	21 021	22 022	23 023	24 024
1		X			
8 i		X	X	X	
3			X		
4 i			X	X	X

CMS55 or CPS55.../71106/...


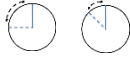
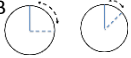


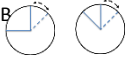













POSITIONS	TOURNER							
	5 6	7 8	9 10	11 12	1 2	13 14	3 4	15 16
1		X	X					
8 i		X	X	X	X	X	X	
3		X	X					
4 i		X	X	X	X	X	X	

CMS55 or CPS55.../77388/...

POSITIONS	TOURNER						
	20 020	21 021	22 022	23 023	24 024	25 025	26 026
1		X			X		
8 i		X	X			X	
3		X			X		
4 i		X	X				

We are able to realize all others diagrams on request in the limit of 10 Turn contacts












Turn functions summary table

Turn			
Positions	examples	functions	
		Without light	With light*
2 fixed positions	1 or 4 	1	4
2 positions including 1 impulse	16A or 162A  16B or 162B 	16A 16B	162A 162B
3 fixed positions	31 or 32 	31	32
3 positions including 1 impulse	316A/326A  316B/326B 	316A 316B	326A 326B
3 positions including 2 impulse	36 or 362 	36	362
4 fixed positions	41  44 	41	44
4 positions including 1 impulse	416A  416B 	416A 416B	-
4 positions including 2 impulse		-	55
5 fixed positions	51 or 52 	51	52
5 positions including 1 impulse	516A  516B 	516A 516B	516A 516B
5 positions including 2 impulse		516C	516C
6,7,8 positions	61  71  81 	61 71 81	-

* With light : Product equipped with a light socket (lamp not included).

Others realization on request

Turn Push functions summary table

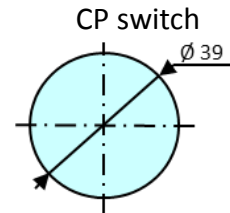
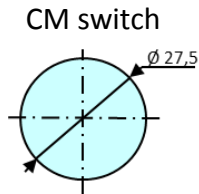
Turn Push			
Positions	examples	functions	
		Without light	With light*
2 fixed positions		-	5 10
3 fixed positions	  	-	17
4 fixed positions	46  46 or 47 	46	47
4 positions including 1 impulse		-	54
5 fixed positions		-	42
6,7,8 positions	66  76  86 	66 76 86	-

* With light : Product equipped with a light socket (lamp not included).

Others realization on request

Dimensions

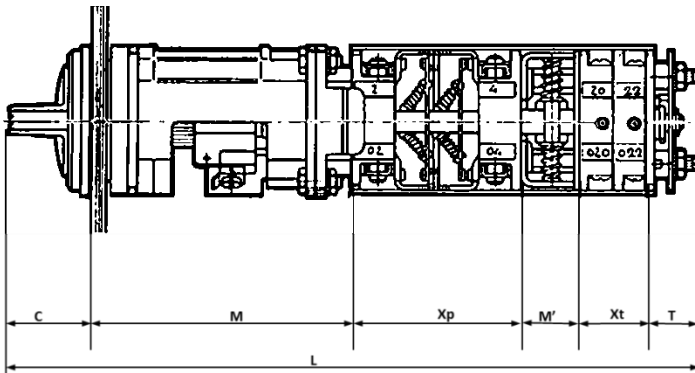
Drillings



i Refer to installation guide for type C switches for installation and maintenance.

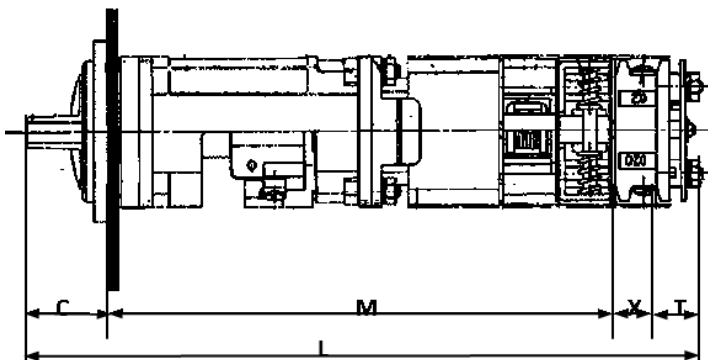
Rear length

CM or CP functions : 5,17,47,42*



C	Fixed dimension	24 mm
M	Fixed dimension	74 mm
Xp	Variable dimension: Multiply by the number of push stages	25 mm
M'	Fixed dimension	17 mm
Xt	Variable dimension: Multiply by the number of turn stages	12 mm
T	Fixed dimension	14 mm

CM or CP functions : S55*



C	Fixed dimension	24 mm
M	Fixed dimension	132 mm
Xt	Variable dimension: Multiply by the number of turn stages	12 mm
T	Fixed dimension	14 mm

* Other functions consult us

* The specifications and drawings given are subject to change and are not binding unless confirmed by our specialists.

Electrical, mechanical, environmental characteristics

Electrical characteristics

Rated thermal current (I_{th})

10A

Dielectric strength

2500V-50Hz-1min

Rated alternate current (I_e) (AC)

Standard silver contacts	Turn						Push					
	Rated working voltages (V)	220			380			220			380	
AC-11 (A)	7			5			6			4		
AC-21 (A)	10			10			10			10		
AC-22 (A)	10			10			10			10		
AC-23 (A)	8			6			7			5		
Rated direct current (I _e) (DC)												
Standard silver contacts	Turn						Push					
	Rated working voltages (V)	24	48	60	110	127	220	24	48	60	110	127
DC-11 (A)	10	5,5	4	1,2	0,8	0,25	10	8	6	2	1,5	0,5
DC-21 (A)	10	10	10	3,5	2,5	0,8	10	10	10	6,5	4,5	1,8
DC-22 (A)	10	6	4,5	1,2	0,8	0,25	10	8,5	6,5	2	1,5	0,6
DC-23 (A)	10	4,5	3	1	0,7	0,2	10	7,5	5,5	1,8	1,3	0,5

Minimum utilization characteristics

Standard silver contacts

5V-50mA

Special Gold/Silver contacts

1V-10mA

Maximum connection (Cu only)

Rigid or flexible cable
Screw/clamp

2 X 2,5 mm² max

Electrical, mechanical, environmental characteristics

Mechanical and environmental characteristics

Mechanical strength	1 000 000 cycles of semi-intensive operation
Fixing	By central nut on a 2 to 5mm panel thick (with escutcheon) or 5 to 8mm (without escutcheon) The device does not have to support the weight of the cables
Tightening torque for terminals (Recommended screwdriver : \varnothing 4mm)	0,5-0,8 N.m
Terminals protection level	IP00 (without cover) – IP2X (with cover)