



COMELETRIC

Specialized rotary and control switches

CONTROL SWITCHES AND
DISCREPANCY SWITCHES
R20 - DR20



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THE ADVANTAGES ARE YOURS

The new switches/discrepancy switches "R20-DR20" have special characteristics that make them very different from the normal switches on the market. Listed below are some of the many advantages they provide.

I Nuovi commutatori / manipolatori serie "R20-DR20" hanno caratteristiche particolari che li rendono molto differenti dai commutatori comunemente in commercio, elenchiamo di seguito quali sono ed i vantaggi che garantiscono.



Double bridge Rotor contact Knife type Fixed contacts with self-cleaning effect.
Contatto mobile a doppio ponte contatti fissi a coltello con effetto strisciante autopulente.

* Contact system with self-cleaning action on both sides of contact, suitable for being used in highly aggressive environments, with presence of high percentage of saline dust and corrosive agents

* Sistema contatto strisciante con effetto autopulente su entrambe le superfici di contatto particolarmente idonei ad essere utilizzati in ambienti altamente aggressivi, presenza di polvere alto tasso salino ecc....

* High resistance to shock and vibration, due to the clip and blade contact design.

*Elevata resistenza a Shock e Vibrazioni. Poiché il contatto fisso è posizionato tra le due lame, il contatto viene premuto su una lama nel caso la forza sull'altra diminuisca.

* Terminals with protection IP20 according to IEC 60529 with two entries.

* Morsetti con protezione IP20 in conformità alla normativa IEC 60529 con doppio ingresso.

* Easy access to the screws of each terminal even when the switch is wired.

* Accesso alla vite del singolo morsetto anche a commutatore cablato per facilitare le operazioni di manutenzione.

* High mechanical strength, shaft and main structure in zinc plated steel, suitable for tropical climates.

* Elevata robustezza meccanica, albero e struttura portante interamente in acciaio zincato elettroliticamente, idoneo ad essere montato anche in zone tropicali.



IP20 terminal screw with two entries .
Easy access to screws even when the switch is wired.
Morsetto con protezione IP20 a doppio ingresso. L'accesso alla vite garantito anche a commutatore cablato.

* Terminals screws at 45° for ease of access.

* Morsetti con viti inclinate a 45° per accessi difficoltosi [facilità di accesso al morsetto anche dal retro del commutatore].

* Last generation polymer with high mechanical strength and excellent electrical characteristics. Self-extinguishing UL94V0.

* Tecnopolimero di ultima generazione con ottima resistenza meccanica, elevate caratteristiche elettriche ed autoestinguente UL94V0.



Terminal easy to access from the rear of the switch thanks to the inclined screw 45°.
Morsetto con viti inclinate a 45° facilità di accesso al morsetto anche dal retro del commutatore.

* Wide range of accessories available.

* Ampia gamma di accessori disponibili.

* Captive plus/minus terminal screws M3.5.

* Vite M3.5 con cavaliere serrafilo autosollevante e viti captive taglio +/-.

* Terminals supplied opened for fast and easy installation.

* Terminali forniti aperti per velocizzare le operazioni di cablaggio.



Horizontal Wiring
Cablaggio orizzontale dei cavi.



Vertical Wiring
Cablaggio verticale dei cavi

* Double choice of location of the cables. Possibility of wiring horizontally or vertically on a single model of switch.

* Doppia scelta di ubicazione dei cavi con possibilità di cablaggi verticali ed orizzontali in un unico commutatore.

* Numbered plastic cover, customizable and replaceable in case of failure without removing the wires to the switch.

* Tegolino con numerazione morsetti personalizzabile e sostituibile in caso di errore senza scablare il commutatore.



Double access to terminals allows close mounting of switches.
Possibilità di montaggio ravvicinato dei commutatori possibile grazie al morsetto con doppia accessibilità.

* Geometric body insulation allows economizing space allowing close mounting of switches.

* Geometria dell'isolante permette una economicizzazione degli spazi permettendo il montaggio ravvicinato dei commutatori.

* A wide range of realizable switching schemes

* Ampia gamma di schemi elettrici realizzabili

* Same parts used for base or panel mounting (upside down mounting).

* Stesse parti utilizzate per fissaggio base o fissaggio retroquadro (montaggio ribaltato).

* Up to 23 packets of contacts assembled in a single switch.

* Fino a 23 pacchi di contatti assemblati in un unico commutatore.

* Version tandems switch 2-3-4 series switches operated by a single handle.

* Versione Tandem switch 2-3-4 commutatori in serie manovrati da un unico attuatore.

* 2/3 positions switch with the possibility of an internal common (avoids external bridges).

* Commutatori a 2/3 posizioni con possibilità di comune interno (evita di eseguire ponti esterni).



Same parts used for base or panel mounting (upside down mounting).
Per il Commutatore Base Mounting vengono utilizzate le medesime parti ma montate up-side down

Series R20

CONTROL SWITCH

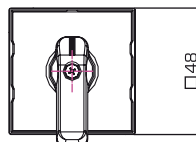
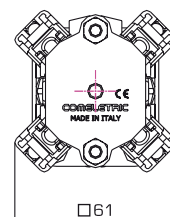
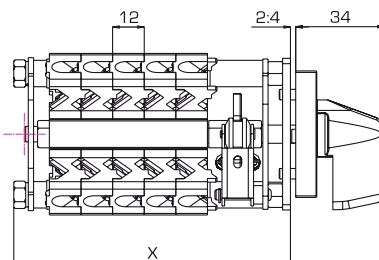


Model : R101 Stay Put Positions
R109 Spring Return Positions (Max 10 packets)

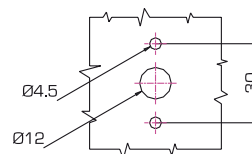
It can have from 2 to 8 positions fixed or with automatic return.
It may be supplied with frontplate size
48x48mm (Q4) or 64x64mm (Q7)

Realizza da 2 a 8 posizioni sia fisse che con molla di ritorno.
Può essere fornito con mostrina frontale
48x48mm (Q4) o 64x64mm (Q7).

Dimensions



Square
Frontplate (Q4)



Panel Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	69	81	93	105	117	129	141	153	165	177	189	201

MAX 23 PACKETS

Series R20

KEY OPERATED SWITCH

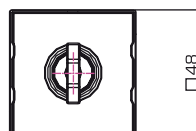
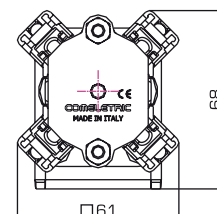
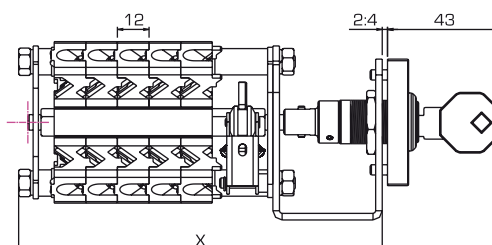


Model : R102 Stay Put Positions
R148 Spring Return Positions (Max 6 packets)

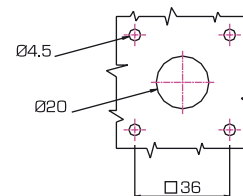
Key Operated rotary switch.
Available with keys equal to each other and up to
200 different combinations.

Commutatore con operatore a chiave
Disponibile con chiavi uguali tra loro e fino a 200 combinazioni
diverse tra loro.

Dimensions



Square
Frontplate (CQ4)

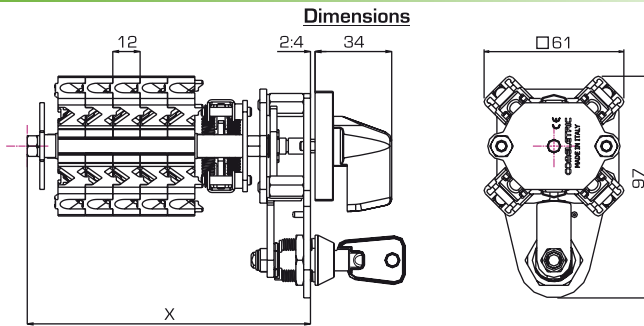


Panel Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8
X=LENGHT mm LUNGH mm	102	114	126	138	150	162	174	186

Series R20

KEY LOCK CONTROL SWITCH



**Square
Frontplate (Q4)**

Panel Drilling



Model : R103 Stay Put Positions
R115 Spring Return Positions (Max 10 packets)

Key Lock rotary switch.

Available with keys, that can be both equals or different one from the other (up to 500 different numbers).
MASTER KEY System is also available.

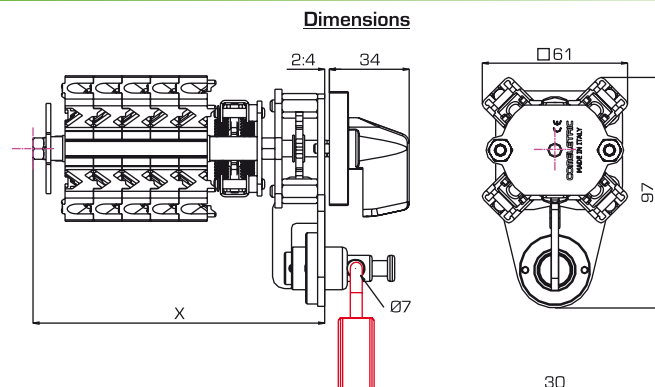
Commutatore con serratura di blocco.
Disponibile con chiavi uguali tra loro o fino a 500 combinazioni diverse tra loro. Disponibile anche con MASTER KEY.

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	89	101	113	125	137	149	161	173	185	197	209	221

MAX 23 PACKETS

Series R20

CONTROL SWITCH WITH PADLOCKABLE FACILITY



**Square
Frontplate (Q4)**

Panel Drilling



Model : R193L Stay Put Positions
R167L Spring Return Positions (Max 10 packets)

Switch with padlockable system.

Pulling the pin positioned below the handle, the switch can be locked in the desired position by inserting the padlock.

Commutatore con dispositivo lucchettabile.
Tirando il perno posto sotto la manopola, si ottiene il blocco della manovra e l'inserimento del lucchetto.

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	87	99	111	123	135	147	159	171	183	195	207	219

MAX 23 PACKETS

Series DR20

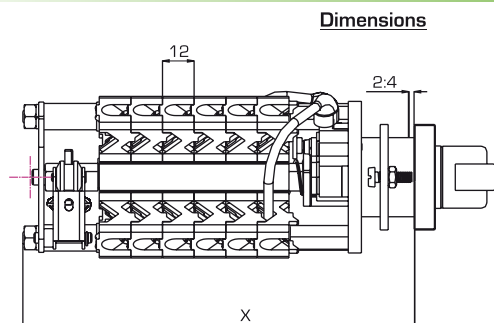
CONTROL DISCREPANCY SWITCH



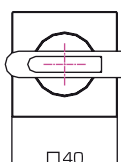
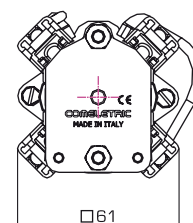
Model : DR105 Turn - Push to turn

Discrepancy switch for indicating and control HV Circuit Breakers or Disconnector Switches status.

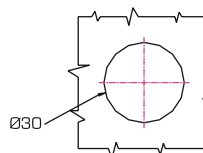
Manipolatore comando e conferma, idoneo a comandare e visualizzare lo stato di Interruttori e Sezionatori AT.



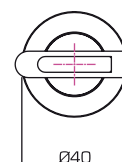
Dimensions



Square Frontplate (MQ1)



Panel Drilling



Round Frontplate (MT1)

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10
X=LENGHT mm LUNGH mm	114	126	138	150	162	174	186	198	210	222

Series DR20

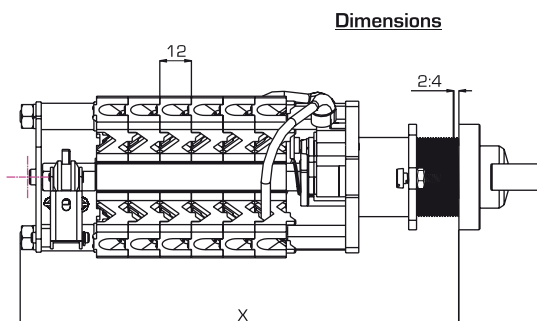
CONTROL DISCREPANCY SWITCH WITH OPALINE HANDLE



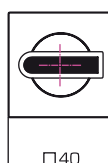
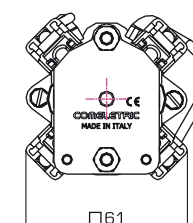
Model : DR108 Turn - Push to turn

Discrepancy switch with opaline handle. Light Provided by means of a LED lamp bayonet type BA9s.

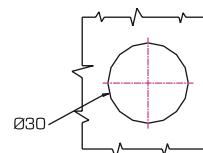
Manipolatore comando conferma con manopola opalina. La segnalazione luminosa avviene mediante lampada LED con attacco BA9s.



Dimensions



Square Frontplate (MQ1)



Panel Drilling



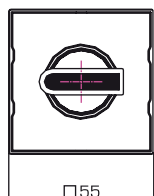
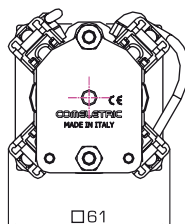
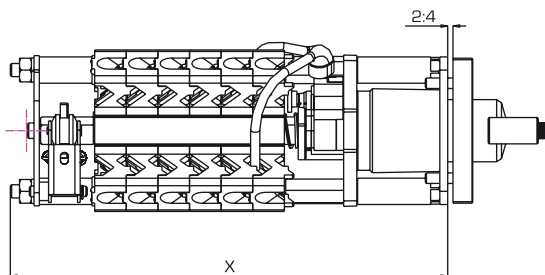
Round Frontplate (MT1)

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10
X=LENGHT mm LUNGH mm	130	142	154	166	178	190	202	214	226	238

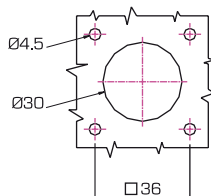
Series DR20

CONTROL DISCREPANCY SWITCH 5 HOLE MOUNTING

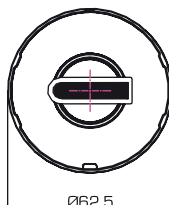
Dimensions



**Square
Frontplate (MQ5)**



Panel Drilling



**Round
Frontplate (MT5)**

Model : DR110 Turn - Push to turn

Discrepancy switch.
New fitting system facilitated by the 5 holes.
Escutcheon plates available in different colours.

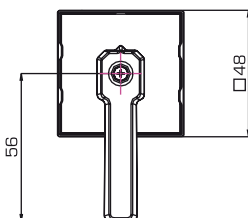
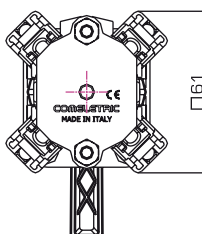
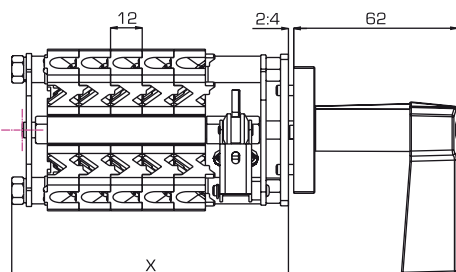
Manipolatore comando conferma.
Il nuovo sistema di fissaggio al pannello a 5 fori agevola
l'operazione di fissaggio. Targhette disponibili in varie colorazioni.

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10
X=LENGHT mm LUNGH mm	130	142	154	166	178	190	202	214	226	238

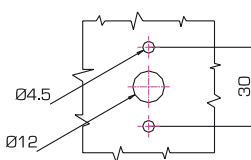
Series R20

CONTROL SWITCH WITH PISTOL GRIP HANDLE

Dimensions



**Square
Frontplate (Q4)**



Panel Drilling

Model : R101P Stay Put Positions
R109P Spring Return Positions (Max 10 packets)

Switch with pistol knob.
It may have from 2 to 8 positions fixed or with automatic return.
It can be supplied with frontplate 48X48mm (Q4) or 64X64mm (Q7).

Commutatore con manopola a pistola.
Realizza da 2 a 8 posizioni sia fisse che con molla di ritorno.
Realizzabile con mostrina frontale 48x48mm(Q4) o 64x64mm(Q7).

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	69	81	93	105	117	129	141	153	165	177	189	201

MAX 23 PACKETS

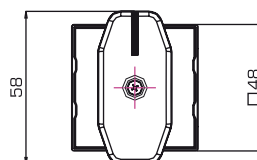
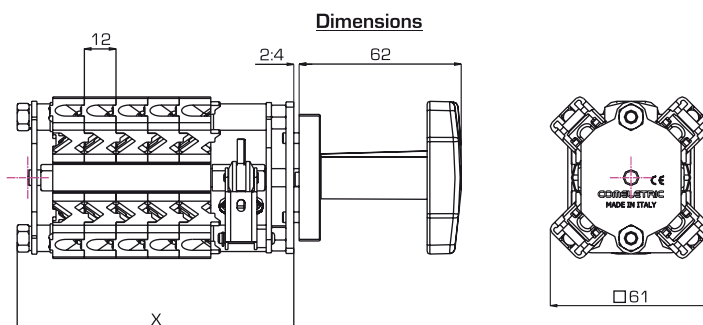
Series R20

CONTROL SWITCH WITH OVAL HANDLE

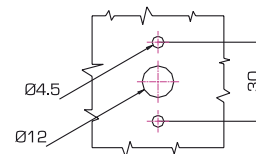


Model : R101V Stay Put Positions
R109V Spring Return Positions (Max 10 packets)

Switch with oval handle.
It may have from 2 to 8 positions fixed or with automatic return.
Special design of the knob makes operation smooth even for switches with large number of contacts.
Commutatore con manopola Oval.
Realizza da 2 a 8 posizioni sia fisse che con molla di ritorno.
Lo speciale design della manopola grazie alla particolare impugnatura rende maneggevole anche la manovra di commutatori con un elevato numero di pacchi.



Square
Frontplate (Q4)



Panel Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	69	81	93	105	117	129	141	153	165	177	189	201

MAX 23 PACKETS

Series R20

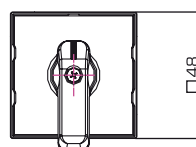
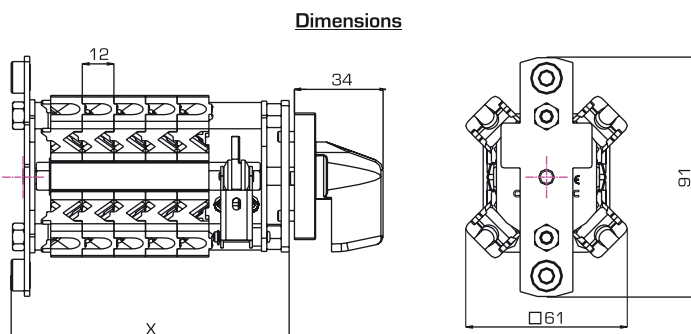
BASE MOUNTING CONTROL SWITCH



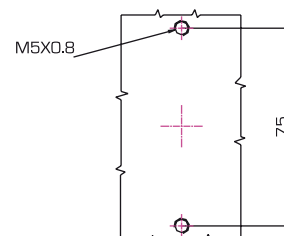
Model : R141 Stay Put Positions
R149 Spring Return Positions (Max 10 packets)

Switch suitable for fitting at the bottom of the panel.
Access to screw from the front of the switch.

Commutatore idoneo al montaggio sul fondo del quadro.
L'accesso alle viti avviene dal fronte del commutatore.



Square
Frontplate (Q4)



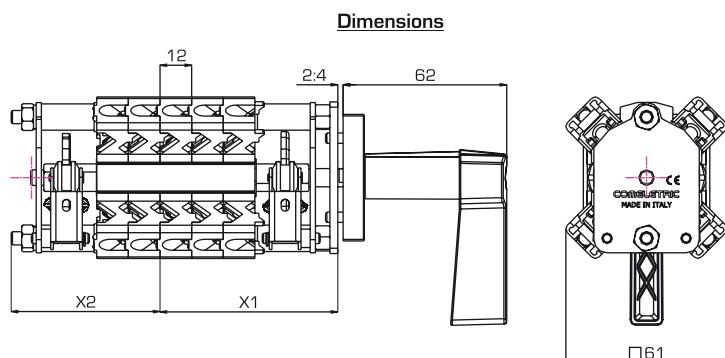
Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	70	82	94	106	118	130	142	154	166	178	190	202

MAX 15 PACKETS

Series R20

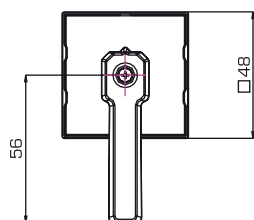
CIRCUIT BREAKER CONTROL SWITCH



Model : R118 Circuit Breaker Control Switch

Designed for the Circuit Breaker control. It consists of two main groups of contacts and a dragging joint. The group dragged contacts is used as an alarm or indication. Available also with frontplate 64x64mm with TRIP INDICATOR (SQ7).

Progettato per il comando interruttori. Esso è formato da due gruppi di contatti uno principale ed uno trascinato. Il gruppo contatti trascinato viene utilizzato come allarme o indicazione. Disponibile anche con mostrina 64x64mm con TRIP INDICATOR (SQ7).

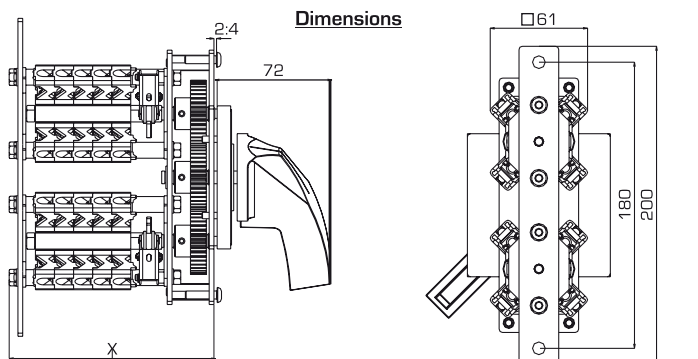


Square Frontplate (Q4)

	X1=Main Switch					+	X2=Dragged Switch				
N° PACKETS N° PACCHI	1	2	3	4	5		1	2	3	4	5
X=LENGHT mm LUNGH mm	56	68	80	92	104		57	69	81	93	105

Series R20

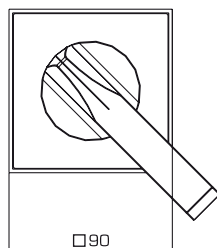
TANDEM DRIVE MECHANISME (TANDEM SWITCH)



Model : TR101 Stay Put Positions

This device is used to connect several switches so that they can be operated simultaneously, thanks to this system a large number of contacts can be obtained in a minimal space.

Questo dispositivo viene utilizzato per collegare più commutatori in modo che possano essere manovrati contemporaneamente. Grazie a questo sistema si possono ottenere un elevato numero di contatti riducendo al minimo l'ingombro.



Square Frontplate (Q9)

N° PACKETS N° PACCHI	10+10	11+11	12+12	13+13	14+14	15+15	16+16	17+17	18+18	19+19	20+20
X=LENGHT mm LUNGH mm	202	214	226	238	250	262	274	286	298	310	322

MAX 23*2 PACKETS

Series R20

AUXILIARY SWITCH

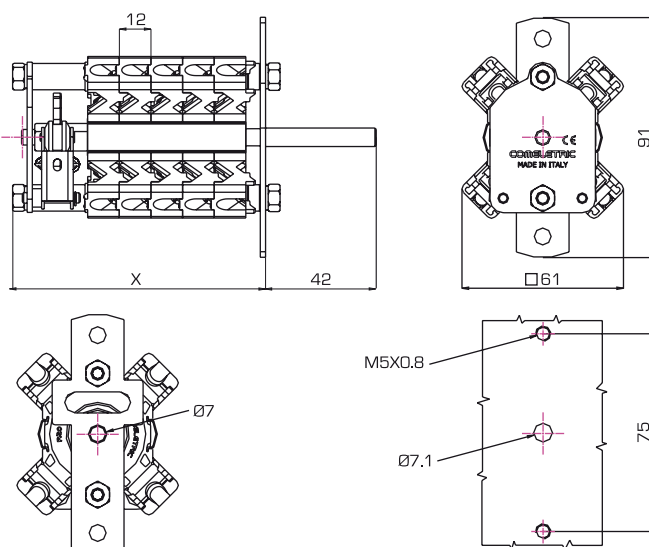


Model : R113 Stay Put Positions

Auxiliary switches are specially designed for use in the auxiliary circuit breakers or disconnectors.

I commutatori ausiliari forniscono contatti ausiliari che vengono utilizzati come segnalazione e interblocco nel circuito principale in sezionatori / interruttori.

Dimensions



Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	64	76	88	100	112	124	136	148	160	172	184	196

MAX 23 PACKETS

Series R20

KEY LOCK CONTROL SWITCH WITH OVAL HANDLE

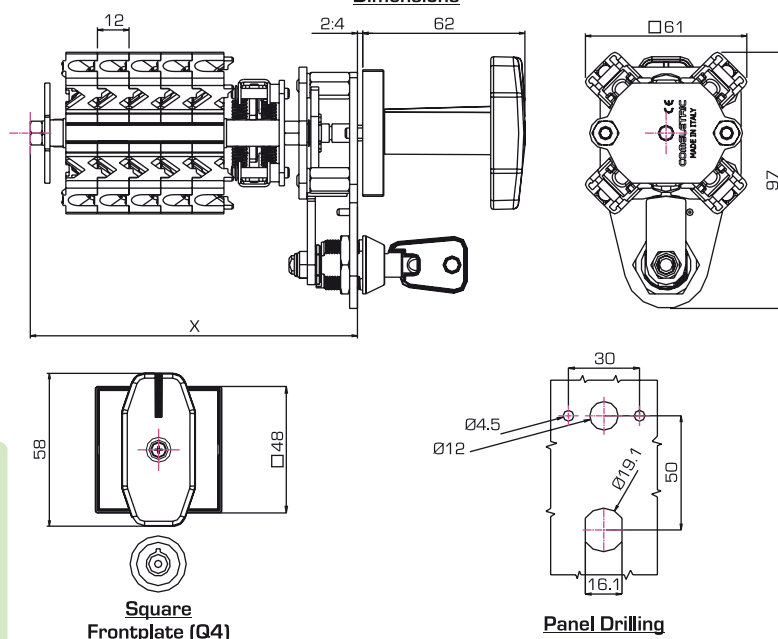


Model : R103V Stay Put Positions
R115V Spring Return Positions (Max 10 packets)

Switch with oval handle and key lock.
It may have from 2 to 8 positions fixed or with automatic return.
Available with keys, that can be both equals or different one from the other (up to XXX different numbers). MASTER KEY System is also available.

Commutatore con manopola Oval e serratura di blocco.
Realizza da 2 a 8 posizioni sia fisse che con molla di ritorno.
Disponibile con chiavi uguali tra loro o fino a XXX combinazioni diverse tra loro.
Disponibile anche con MASTER KEY System.

Dimensions



Square Frontplate (Q4)

Panel Drilling

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	89	101	113	125	137	149	161	173	185	197	209	221

MAX 23 PACKETS

	Key removable in pos. ESTRAZIONE DELLA CHIAVE		Closed without current breaking CHIUSO SENZA INTERRUZIONE
	Spring return RITORNO AUTOMATICO		Make-before-break contacts STABILISCE PRIMA DI INTERROMPERE
	Closed contacts CONTATTO CHIUSO		Maintained action contact CONTATTO TRASCINATO

Accessories:
Accessori:

Pistol knob Manopola a pistola		Push Button Interlock. Pulsante di Blocco Manovra.	
Gilded Contacts Contatti Dorati		Manopola Ovale Oval Handle	
Chiave Master Key Master Key		Mostrina 64x64mm Escutcheon 64x64mm	
Different numbering of key Matriciatura chiavi diverse		Electromagnetical Interlock Interblocco elettromagnetico	

Description Descrizione	CODE: { it will given by COMELETRIC } CODICE: { sarà fornito da COMELETRIC }
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Note:

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TECHNICAL DATA

DATI ELETTRICI

Standard utilization categories
Categorie di Utilizzazione normalizzate

Kind of current Tipo di corrente	Category Categoria	Typical applications Applicazioni tipiche
Alternative current Corrente alternata	AC14	Control of small electromagnetic load with rated power = 72VA Comando di piccoli carichi elettromagnetici con potenza = 72VA
	AC15	Control of electromagnetic load with rated power > 72VA Comando di carichi elettromagnetici con potenza > 72VA
	AC22	Switching of mixed resistive and inductive loads, including moderate overload Manovra di carichi misti, resistivi e induttivi con sovraccarichi di modesta entità
	AC23	Switching of motor loads or other highly inductive loads Manovra di motori o altri carichi altamente induttivi.
Direct current Corrente continua	DC13	Control of electromagnets Comando di elettromagneti
	DC14	Control of electromagnetic loads having economy resistor in circuit Comando di carichi elettromagnetici aventi resistori economizzatori nel circuito
	DC21	Switching of resistive loads including moderate overloads Manovra di carichi resistivi con sovraccarichi di moderata entità
	DC23	Switching of highly inductive loads (e.g. Series Motor) Manovra di carichi altamente induttivi (es. Motori in serie)

NORMAL CONDITIONS CONDIZIONI NORMALI				
Utilization category Categoria utilizzazione	Make Chiusura I/I _e	Break Interruzione I/I _e	U/U _e	cos Φ
AC14	6	1	1	0.3
AC15	10	1	1	0.3
AC22	1	1	1	0.8
AC23	1	1	1	0.65
				T _{0.95} [ms]
DC13	1	1	1	6xP
DC14	10	1	1	15
				L/R ms
DC21	1	1	1	1
DC23	1	1	1	7.5

ABNORMAL CONDITIONS CONDIZIONI ANOMALE			
Make Chiusura I/I _e	Break Interruzione I/I _e	U/U _e	cos Φ
6	6	1.1	0.7
10	10	1.1	0.3
3	3	1.05	0.65
10	8	1.05	0.45
			T _{0.95} [ms]
1.1	1.1	1.1	6xP
10	10	1.1	15
			L/R ms
1.5	1.5	1.05	1
4	4	1.05	15

- I/I_e : Current to be made or broken and Rated operational current ratio;
rapporto tra la corrente che l'apparecchiatura è in grado di stabilire o interrompere e la corrente d'impiego;
- U/U_e : Voltage before make and Rated operational voltage ratio;
rapporto tra la tensione prima della chiusura e la tensione d'impiego;
- T_{0.95} : Time to reach 95% of the steady-state current;
Tempo per raggiungere il 95% della corrente di regime;
- P=U_e x I_e: steady-state power consumption in W;
potenza assorbita a regime in W;

The value "6xP" result from empirical relationship which is found to represent most d.c. magnetics loads to an upper limit of P =50W, i.e. 6 x P=300 ms. Load having power -consumption greater than 50 W are assumed to consist of smaller loads in parallel. Therefore,300 ms is to be an upper limits irrespective of the power. [REFERENCE STANDARD IEC 947-5-1 tab. 5].

La relazione matematica "6xP" è valida per tutti carichi induttivi rappresentativi fino ad un massimo di P pari a 50W cioè 6xP = 300ms. Si assume che i carichi aventi una potenza assorbita superiore a 50W siano costituiti da piccoli carichi in collegati in parallelo di conseguenza 300ms è il valore massimo a prescindere dalla potenza assorbita.
[RIFERIMENTO NORMA CEI EN 60947-5-1 tab. 5]

RATED ELECTRICAL CHARACTERISTICS CARATTERISTICHE ELETTRICHE NOMINALI

According to standards
Conformità alle norme

IEC 60947-3 - IEC 60947-5-1 - IEC 60947-1 - CEI EN 60947-3 - CEI EN 60947-5-1 - CEI EN 60947-1 - VDE 0660-100 - VDE 0660-107 - VDE 0660-200 - 2006/95/EC (Low Voltage Directive) - 2004/108/EC (EMC Directive) - 2011/65/EU (ROHS Directive).

Conventional free air thermal current Corrente convenzionale termica in aria:	(I _{th})	25 A
Rated insulation voltage Tensione di isolamento nominale:	(U _i)	690 V
Rated impulse withstand voltage Tensione di tenuta ad impulso nominale:	(U _{imp})	4 kV
Dielectric test voltage corresponding to the rated insulation Voltage Tensione di prova corrispondente alla tensione di isolamento nominale:		2500 V/60s (50Hz)
Frequency: Frequenza di impiego		50/60Hz
Relevant information about the associated Short Circuit Protective Device Dati relativi al dispositivo di protezione contro il corto circuito associabile		
Rated conditional short-circuit current (Max Peak current) Massima Corrente di picco ammissibile:		1550 A
Rated Maximum Joule integral Integrale di Joule massimo:		38 kA ² s
Rated Short-time current Corrente nominale di breve durata: (1s) (I _{cw})		300 A
Contact Resistance Resistenza di contatto:		2.5 mΩ

MAKING AND BREAKING CAPACITIES POTERI DI CHIUSURA ED INTERRUZIONE

Utilization Category Categoria di utilizzazione	(U _e)	(I _e)
AC 14	400 V	16 A
AC 15	400 V	10 A
AC 22A (3 poli - 3 phase)	415 V	25 A
AC 23A (3 poli - 3 phase)	415 V	20 A
DC13	220 V	6 A
DC14	110 V 250 V	6 A 2.5 A
DC21A	220 V	16 A
DC23A	220 V	6 A

RESISTENCE TO SHOCK AND VIBRATION (IEC 61373 - CEI EN 61373 Railway applications ,Rolling stock equipment)

RESISTENZA VIBRAZIONI E URTI (IEC 61373 - CEI EN 61373 Applicazioni Ferroviarie , Materiale rotabile).
(Excluding models DR105-DR108-DR110) - (Esclusi modelli DR105-DR108-DR110)

Vibration Resistance
Resistenza alle vibrazioni:

Vibration Range: 5 to 150Hz , Acceleration : 5.72m/s² , Time: 5h (in 3 direction)
Range di frequenza: 5 to 150Hz , Accelerazione : 5.72m/s² , Tempo : 5h (in 3 direzioni)

Shock Resistance
Resistenza agli urti:

Acceleration : 50 m/s² (in 6 direction) , Time : 30ms
Accelerazione : 50 m/s² (in 6 direzioni) , Tempo : 30ms



Recommended tightening torque to avoid thread stripping
Don't exceed torque more than indicated.

Coppia di serraggio consigliata per evitare di rovinare il filetto della vite
Non superare la coppia più di quanto indicato.

Connecting Screw Vite contatto terminale		M 3.5
Tightening Torque Coppia serraggio viti	(Nm)	1.2
Permissible Wire Gage Sezione del conduttore		
Single - core or stranded wire Cavo rigido o intrecciato	(mm ²)	1.5 - 6 AWG15 - AWG9
Flexible wire Cavo flessibile	(mm ²)	1.5 - 6 AWG15 - AWG9

ENVIRONMENTAL DATA DATI AMBIENTALI

Temperature range:
Temperatura ambiente:

Operating temperature
Esercizio:

-25°C + 60°C

Storage temperature
Stoccaggio:

-40°C + 80°C



R20 01/14



UNI EN ISO 9001/2008



IEC 60947



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