COMELETRIC

Specialized rotary and control switches

CONTROL SWITCHES
R16

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TRADITION IN EVOLUTION

R16 Control Switches are the result of a perfect match between tradition and technological innovation.
Comeletric products have been outstanding for more than 50 years thanks to their quality. Their historical qualitative characteristics now successfully coexist with an ultra-compact and up-to-date design that makes R16 series switches highly functional and effective.

I commutatori R16 sono nati dal perfetto connubio tra tradizione ed evoluzione tecnologica. In un solo prodotto convivono le caratteristiche qualitative che da sempre contraddistinguono i prodotti COMELETRIC da oltre 50 anni, sommate ad un design ultracompatto che rende il commutatore moderno con prestazioni e caratteristiche altamente funzionali.

The layout of the insulating discs has been specifically designed to reduce to the minimum the amount of space taken by R16 Control Switches in terms of depth, making them particularly suitable for LCC panels, boxes, withdrawable boxes and for all those applications in which extremely small spaces are involved.

Il layout del diaframma isolante è stato appositamente studiato per garantire il minimo ingombro in profondità e rendere quindi il commutatore R16 particolarmente idoneo al fissaggio nei quadri LCC, in cassette, nei cassetti estraibili o in quelle applicazioni in cui gli spazi dovessero essere particolarmente ristretti.

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 the contacts.
This makes the control switches extremely reliable in highly aggressive environments with high percentages of saline dust and corrosive agents.

Sistema di contatto strisciante con effetto autopulente su entrambe le superfici; rende i commutatori particolarmente idonei ad essere utilizzati in ambienti altamente aggressivi, con presenza di polveri, alto tasso salino, ecc.

Easy access to the terminal screws. It is not necessary to remove the wires to have access to the single screw (free screws system).

Facile accesso alle viti dei terminali anche a commutatore cablato (sistema a viti libere). Non è necessario rimuovere i cavi precedentemente cablati per accedere al terminale.

IP20 Finger proof terminals , easy access to screw even when the switch is wired.
Morsetto con protezione IP20.
L'accesso al morsetto semplificato anche a commutatore cablato.

Thanks to its layout and special materials, the notching mechanism is designed to guarantee both reliability and a long-lasting mechanical life.

Gruppo scatto progettato per elevati cicli di commutazione.
Grazie al layout ed ai materiali impiegati, la lunga durata ed affidabilità sono garantiti negli anni.

Up to 23 packets of contacts can be assembled in single shaft switch.

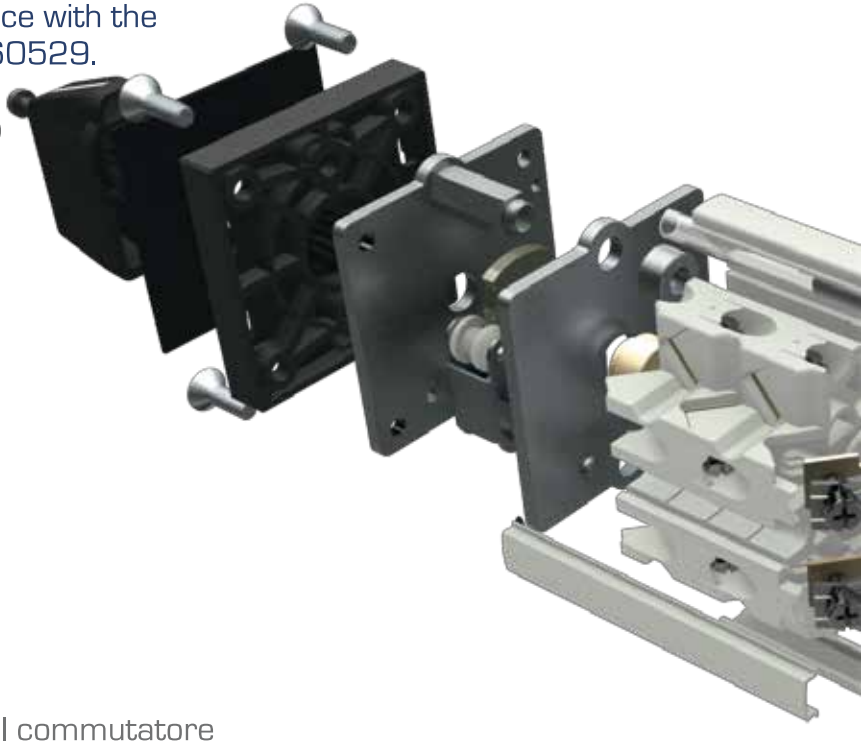
Fino a 23 pacchi di contatti posso essere assemblati in commutatori a singolo albero.

Terminals with IP20 protection, in accordance with the international standard IEC 60529/CEI EN 60529.

Morsetti con protezione IP20, in riferimento alla norma IEC 60529/CEI EN 60529.

Terminals with screws at 40° tilt angle, facilitating the access to the terminals from the rear of the switch.

Morsetti con viti inclinate a 40°.
Agevola l'accesso ai terminali dal retro del commutatore.



Low contact resistance (5mΩ) makes R16 Control Switches suitable also for low currents and low voltage electronic circuits.

Bassa resistenza di contatto (5mΩ), rende il commutatore R16 adatto all'impiego anche in circuiti per l'elettronica con bassi valori di corrente e voltaggio.

Shaft and main structure entirely made of zinc plated steel and specifically designed for the usage of the switch in tropical environments.

Albero e struttura portante interamente in acciaio zincato elettroliticamente , specificatamente studiati per l' impiego del commutatore in ambienti tropicali.

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.

R16 Control Switch can be provided with different front accessories (handles, operating keys, key locks, padlockable systems).
Escutcheon plates of two sizes (mm. 48X48 'Q4', mm.64X64 'Q7').

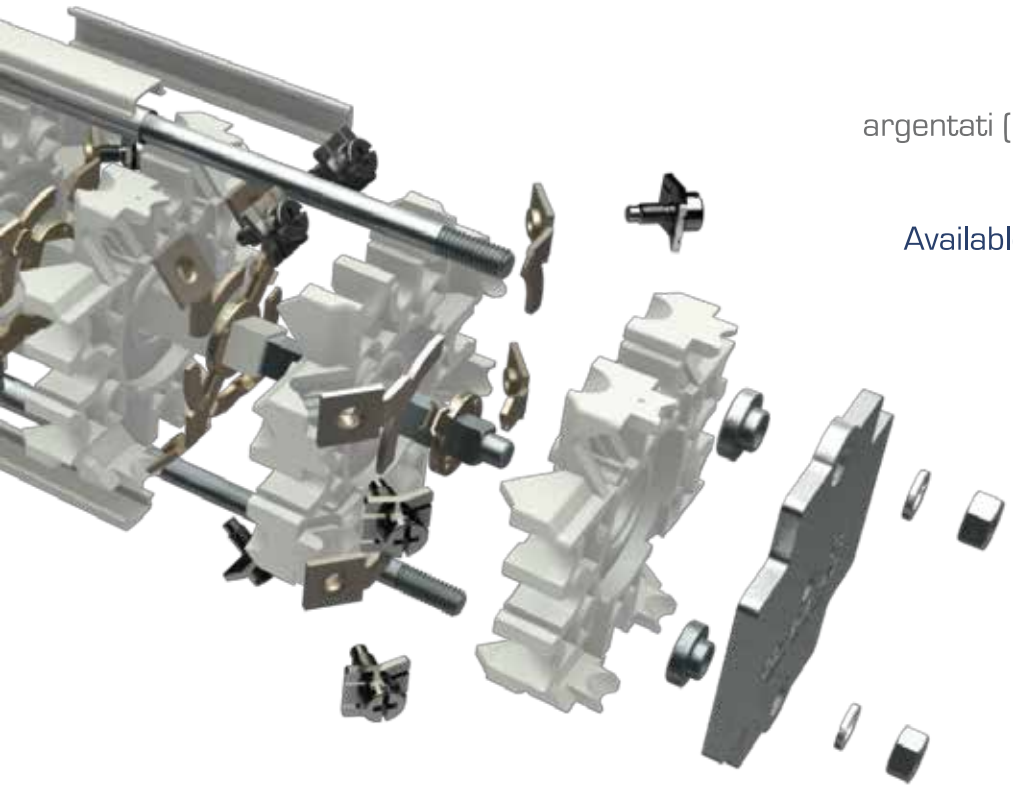
Il commutatore R16 può essere corredato da diversi attuatori di comando (manopole, chiavi di comando, serrature di blocco, sistemi lucchettabili), frontali in due dimensioni (mm.48X48 'Q4', mm.64X64 'Q7').

Insulating disc made of latest generation polymer PA66 with excellent mechanical resistance, high electrical characteristics and self-extinguishing UL94V0.

Diaframma isolante in tecnopolimero di ultima generazione PA66 con ottima resistenza meccanica,elevate caratteristiche elettriche ed autoestinguente UL94V0.

Stationary and rotor contacts are silver plated (standard) and can be gold plated on demand.

Contatti sia fissi che mobili argentati (standard) o dorati su richiesta.



Available with a wide range of different electrical switching schemes.

Ampia gamma di schemi elettrici realizzabili.

Captive plus/minus terminal M3 screw with self-lifting plate.

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

High resistance to shocks and vibrations, thanks to the specific design of the contacts.

Elevata resistenza a shock e vibrazioni, grazie allo speciale design dei contatti.

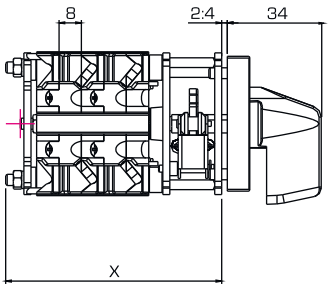
Escutcheon plate engraved and customizable by LASER MARKER.

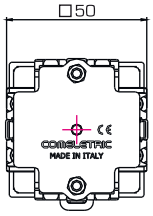
Mostrine frontali incise e personalizzabili mediante INCISIONE LASER.

Series R16

CONTROL SWITCH

Dimensions

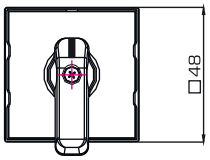




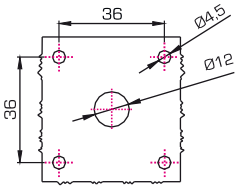
Model : R601 Stay Put Positions
R601M Spring Return Positions (Max 10 packets)

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).



Square Escutcheon plate (Q4)



Panel Drilling

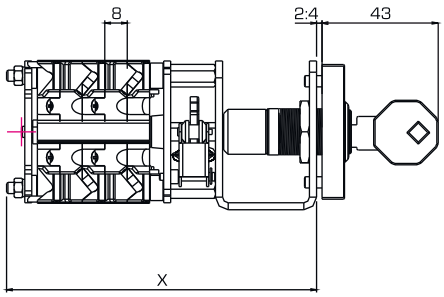
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	51	59	67	75	83	91	99	107	115	123	131	139

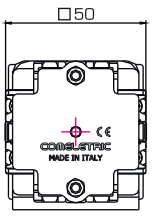
MAX 23 PACKETS

Series R16

KEY OPERATED CONTROL SWITCH

Dimensions

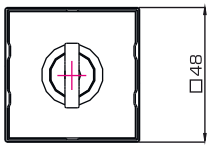




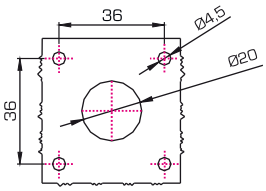
Model : R602 Stay Put Positions
R602M Spring Return Positions (Max 8 packets)

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.



Square Escutcheon plate (CQ4)



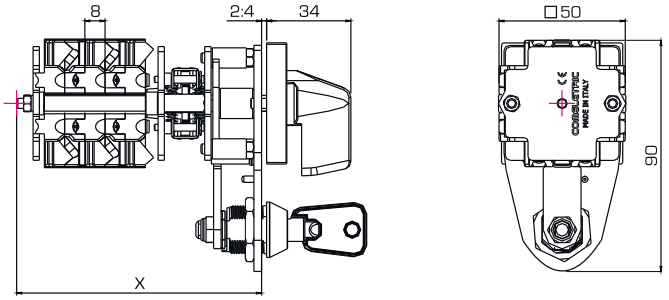
Panel Drilling

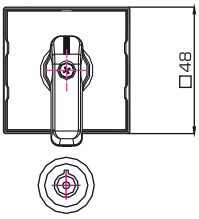
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	83	91	99	107	115	123	131	139	147	155	163	171

Series R16

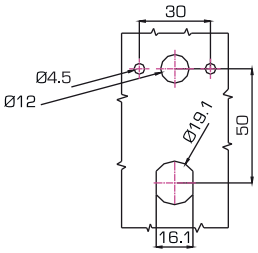
KEY LOCK CONTROL SWITCH

Dimensions





Square Frontplate (Q4)



Panel Drilling

Model : R603 Stay Put Positions
R603M 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.

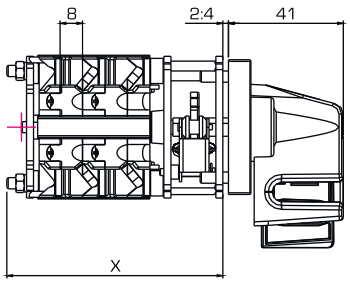
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	71	79	87	95	103	111	119	127	135	143	151	159

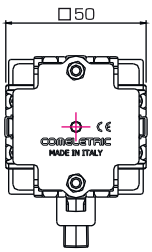
MAX 23 PACKETS

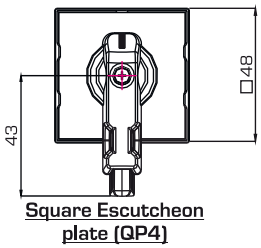
Series R16

CONTROL SWITCH WITH PADLOCKABLE HANDLE

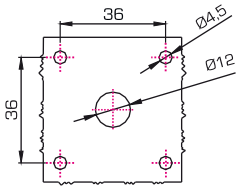
Dimensions







Square Escutcheon plate (QP4)



Panel Drilling

Model : R610 Stay Put Positions
R610M Spring Return Positions (Max 10 packets)

Switch with padlockable handle.
Pushing the red barrel in the handle, the switch can be locked in the desidered position by inserting up to three padlocks.

Commutatore con manopola lucchettabile.
Premendo la leva rossa della manopola si ottiene il blocco della manovra e l'inserimento di un massimo di tre lucchetti.

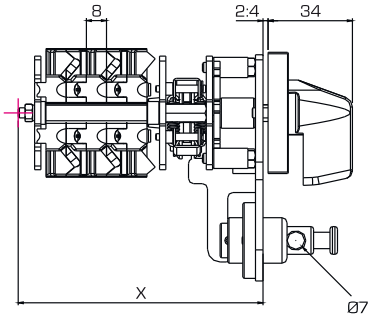
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	51	59	67	75	83	91	99	107	115	123	131	139

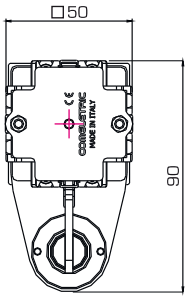
MAX 23 PACKETS

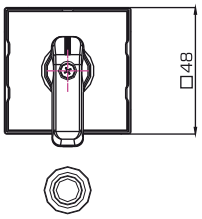
Series R16

WITH HIGH SECURITY PADLOCKABLE SYSTEM

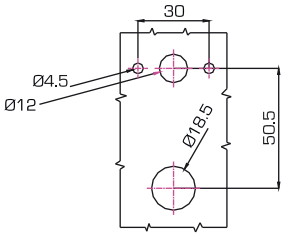
Dimensions







Square Escutcheon plate (Q4)



Panel Drilling

Model : R605 Stay Put Positions
R605M Spring Return Positions (Max 10 packets)

Switch with Padlockable system.
Pulling the pin positioned below the handle the switch can be locked in the desidered 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.

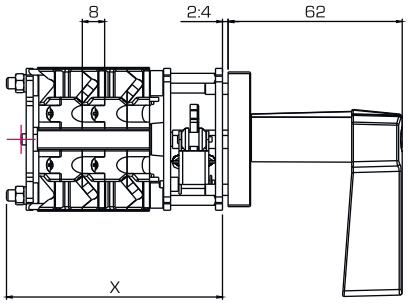
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	71	79	87	95	103	111	119	127	135	143	151	159

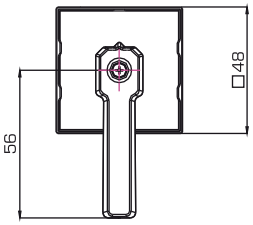
MAX 23 PACKETS

Series R16

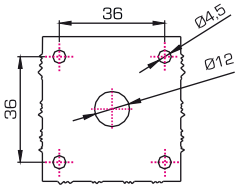
CONTROL SWITCH WITH PISTOL GRIP HANDLE

Dimensions





Square Escutcheon plate (Q4)



Panel Drilling

Model : R606 Stay Put Positions
R606M Spring Return Positions (Max 12 packets)

Switch with Pistol handle.
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).

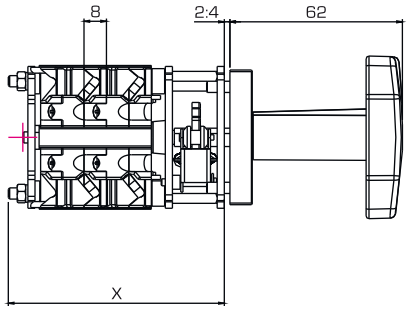
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	51	59	67	75	83	91	99	107	115	123	131	139

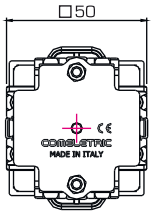
MAX 23 PACKETS

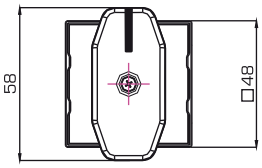
Series R16

CONTROL SWITCH WITH OVAL GRIP HANDLE

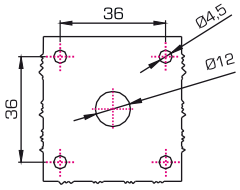
Dimensions







Square Escutcheon plate (Q4)



Panel Drilling

Model : R607 Stay Put Positions
R607M 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 handle makes operation smooth even for switches with large number of contacts. Frontplate (Q4) or (Q7).

Commutatore con manopola a Ovale.
Realizza da 2 a 8 posizioni sia fisse che con molla di ritorno.
Lo speciale design della manopola e la sua particolare impugnatura rendono maneggevole la manovra di commutatori con un elevato numero di contatti.

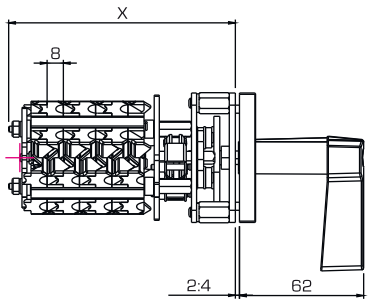
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	51	59	67	75	83	91	99	107	115	123	131	139

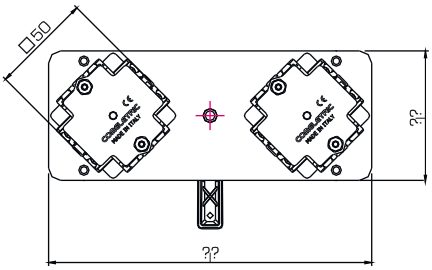
MAX 23 PACKETS

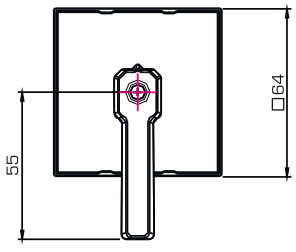
Series R16

CONTROL SWITCH WITH TANDEM DRIVE MECHANISME

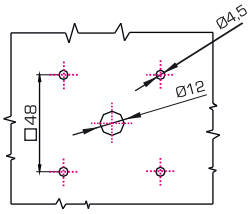
Dimensions







Square Escutcheon plate (Q7)



Panel Drilling

Model : TR601 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.

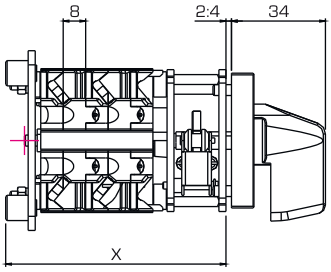
Questo dispositivo viene utilizzato per collegare più commutatori in modo che possano essere manovrati contemporaneamente. Grazie a questo sistema si possono ottenere un elevato numero di contatti riducendo al minimo l'ingombro in profondità.

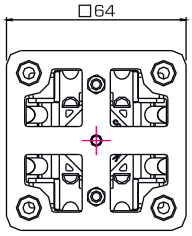
N° PACKETS N° PACCHI	10+10	11+11	12+12	13+13	14+14	15+15	16+16	17+17	18+18	19+19	20+20	21+21
X=LENGHT mm LUNGH mm	145	153	161	169	177	185	193	201	209	217	225	233

MAX 23*2 PACKETS

Series R16

BASE MOUNTING CONTROL SWITCH

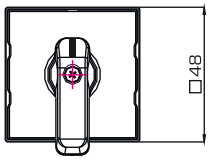




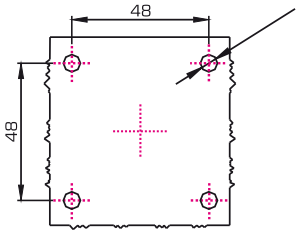
Model : R612 Stay Put Positions
R612M Spring Return Positions (Max 10 packets)

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

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



Square Escutcheon plate (Q4)



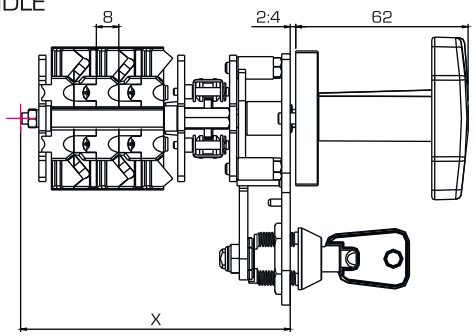
Panel Drilling

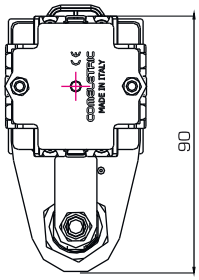
N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	55	63	71	79	87	95	103	111	119	127	135	143

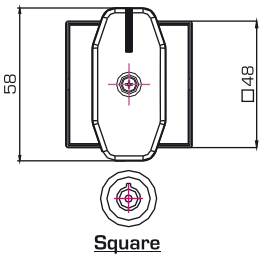
Series R16

KEY LOCK CONTROL SWITCH WITH OVAL HANDLE

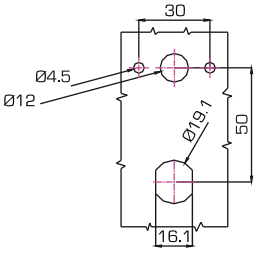
Dimensions







Square Frontplate (Q4)



Panel Drilling

Model : R611 Stay Put Positions
R611M Spring Return Positions (Max 12 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 500 different numbers). MASTER KEY System is also available.

Commutatore con manopola Ovale 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 500 combinazioni diverse tra loro.
Disponibile anche con MASTER KEY System.

N° PACKETS N° PACCHI	1	2	3	4	5	6	7	8	9	10	11	12
X=LENGHT mm LUNGH mm	71	79	87	95	103	111	119	127	135	143	151	159

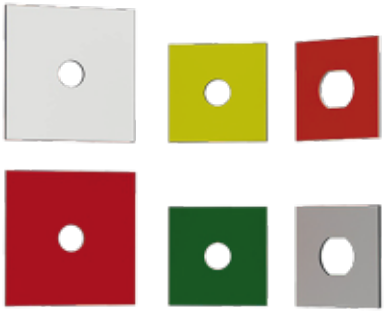
MAX 23 PACKETS

COMELETRIC ACCESSORIES AND SPARE PARTS:

COLOURED HANDLES

Knob with different shapes , Wing , Oval and Pistol for every switching application.
Available in Black , Red , White and Green Colour.
Manopola a Vela , a Pistola ed Ovale , fornibili in varie colorazioni a scelta a seconda dell'applicazione.
Disponibili in Nero, Rosso, Bianco e Verde.

SHAPE	PART NUMBER	COLOR
WING	1500/	BLACK
OVAL	1573/	R=RED
PISTOL	1572/	G=GREEN
		W=WHITE



COLOURED FRONT PLATES

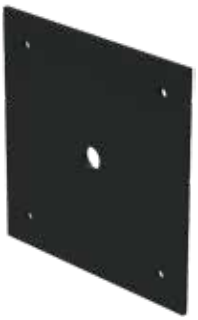
Front Plates can be supplied in Black , White , Electro Grey , Green , Red ,Yellow and Orange Colour.

Mostrine frontali in diversi colori.
Versioni disponibili: Nero, Bianco, Grigio Metallizzato, Verde, Rosso, Giallo ed Arancio.

64*64mm SIZE FRONT PLATE

Special Front Plate 64x64mm.

Mostrina maggiorata 64x64mm



GASKET IP65

To ensure IP65 degree protection in the front of the switch , a gum plate is provided to be fitted below the Front Plate Holder.

Per assicurare il grado di protezione IP65 sul fronte del commutatore, una guarnizione in gomma viene fornita.

GILDED CONTACTS

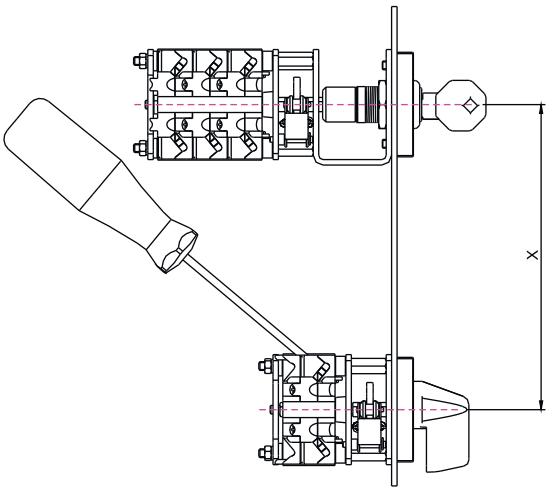
To Improve the Reliability and the Performances even in the most aggressive environments contacts can be supplied with special surface treatments, such as gold with Certificate Thickness.
Per migliorare l' Affidabilità e le Prestazioni anche negli ambienti più aggressivi, è possibile fornire i contatti con speciali trattamenti superficiali, con Spessori Certificati (es. oro)

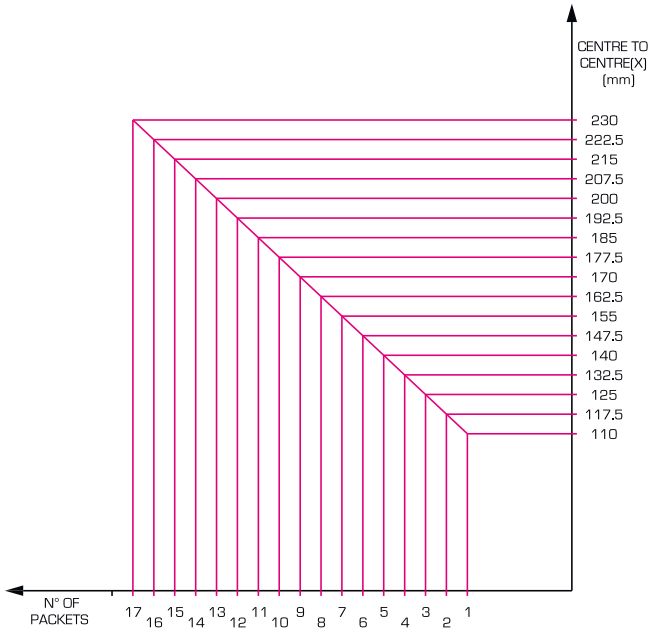
MINIMUM RECOMMENDED DISTANCES:

To ensure easy and complete access to every terminals of the switch , it is recommended to respect the minimum distances mentioned below. As R16 switch has terminals on its four sides it is important to respect those distances all around.

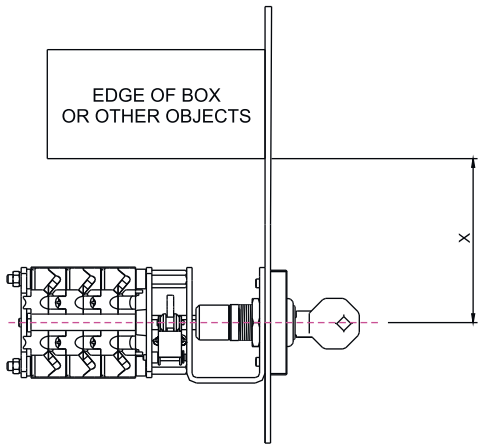
Al fine di garantire la completa accessibilità a qualsiasi terminale del commutatore è consigliabile rispettare le distanze sottoriportate. Dato che il commutatore R16 è dotato di terminali su tutti quattro i lati, le distanze indicate devono essere rispettate su tutti i lati del commutatore.

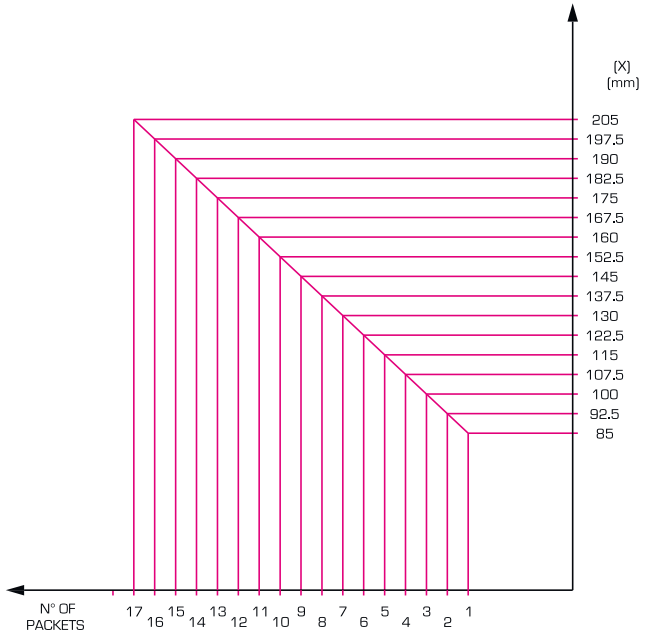
SWITCH TO SWITCH



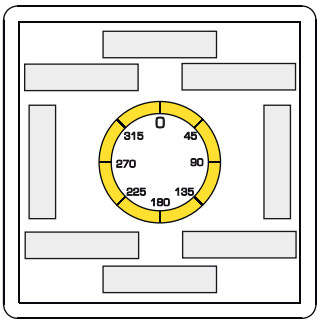


SWITCH TO OTHER INSTRUMENTS





FORM FOR SPECIAL DIAGRAM
MODULO PER SCHEMI SPECIALI



DATE: DATA:	N° ORDER: N° ORDINE:
FIRM: SOCIETA':	
MR: SIG:	
TEL:	FAX:
Q.TY: Q.TA':	DELIVERY DATE: CONSEGNA:

Removable Key ESTRAZIONE CHIAVE								
Positions **POSIZIONI**	1	2	3	4	5	6	7	8
PACKETS **PACCHI** / ENGRAVINGS **DICITURE** / TERMINALS **MORSETTI**								

	Key removable in pos. **ESTRAZIONE DELLA CHIAVE**
	Spring return **RITORNO AUTOMATICO**
X	**Closed contacts** **CONTATTO CHIUSO**

XX	**Closed without current breaking** **CHIUSO SENZA INTERRUZIONE**
X-X	**Make-before-break contacts** **STABILISCE PRIMA DI INTERROMPERE**

Model:

Accessories:
Accessori:

Pistol knob Manopola a pistola	☐	Different numbering of key Matriciatura chiavi diverse	☐
Gilded Contacts Contatti Dorati	☐	Escutcheon 64x64mm Mostrina 64x64mm	☐
Oval Handle Manopola tipo Oval	☐	Padlockable Handle Manopola Lucchettabile	☐

Description
Descrizione

CODE: (it will given by COMELETRIC)
CODICE: (sarà fornito da COMELETRIC)

Note:

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
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

	NORMAL CONDITIONS CONDIZIONI NORMALI			
	Make Chiusura	Break Interruzione		
Utilization category Categoria utilizzazione	**I/Ie**	**I/Ie**	**U/Ue**	**cos Φ**
AC14	6	1	1	0.3
AC15	10	1	1	0.3
				$T_{0,95}$ [ms]
DC13	1	1	1	6xP
DC14	10	1	1	15

	ABNORMAL CONDITIONS CONDIZIONI ANOMALE			
	Make Chiusura	Break Interruzione		
I/Ie	**I/Ie**	**U/Ue**	**cos Φ**	
6	6	1.1	0.7	
10	10	1.1	0.3	
				$T_{0,95}$ [ms]
1.1	1.1	1.1	6xP	
10	10	1.1	15	

I/Ie : 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/Ue : 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=Ue x Ie: Steady-state power consuption in W.
Potenza assorbita a regime in W.

The value "6xP" result from empirical relationship which is found to rapresent most d.c. magnetics loads to an upper limit of P =50W, i.e. 6 x P=300 ms. Load having power-consuption greater than 50W 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 60947-5-1 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 collegati in parallelo, di conseguenza 300ms è il valore massimo a prescindere dalla potenza assorbita.
(RIFERIMENTO NORMA IEC 60947-5-1 tab. 5)

RATED ELECTRICAL CHARACTERISTICS
CARATTERISTICHE ELETTRICHE NOMINALI

According to standards Conformità alle norme		**IEC 60947-1 - IEC 60947-1/A1 - IEC 60947-5-1 – IEC 60947-5-1/A1 - EN 60947-1 - EN 60947-1/A1 - EN 60947-5-1 – EN 60947-5-1/A1- VDE 0660-100 - 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	**(Ith)**	20A
Rated insulation voltage Tensione di isolamento nominale :	**(Ui)**	690V
Rated impulse withstand voltage Tensione di tenuta ad impulso nominale:	**(Uimp)**	4KV
Frequenza di impiego Frequency:		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		1400A
Rated Maximum Joule integral Integrale di Joule massimo		30 kA^2 s
Rated Short-time current (1s) Corrente nominale di breve durata	**(Icw)**	60 A
Contact Resistance Resistenza di contatto		mΩ 5

MAKING AND BREAKING CAPACITIES
POTERI DI CHIUSURA ED INTERRUZIONE

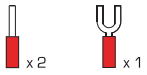
Categoria di utilizzazione Utilization Category	**(Ue)**	**(Ie)**
AC 14	400V	10A
AC 15	400V	6A
DC13	220V	6A
DC14	110V 250V	3,5A 1,5A

RESISTANCE 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).

Vibration Resistance Resistenza alle vibrazioni:	Vibration Range: 5 to 150Hz , Acceleration : 5.72m/s^2, Time: 5h (in 3 direction) Range di frequenza: 5 to 150Hz , Accelerazione : 5.72m/s^2, Tempo : 5h (in 3 direzioni)
Shock Resistance Resistenza agli urti:	Acceleration : 50 m/s^2(in 6 direction) , Time : 30ms Accelerazione : 50 m/s^2(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.

Tipo di terminale utilizzabile: Type of connecting terminals:		
Connecting Screw Vite contatto terminale		M 3
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)**	2 x 2.5 2 x AWG13
Flexible wire Cavo flessibile	**(mm^2)**	2 x 2.5 2 x AWG13

ENVIRONMENTAL DATA (IEC 60947-1 - CEI EN 60947-1)
DATI AMBIENTALI

Temperature range: Temperatura ambiente:	
Operating temperature Esercizio:	-25°C + 60°C
Storage temperature Stoccaggio:	-40°C + 80°C
Pollution Degree Grado di Inquinamento:	PLDG 2

R16 01-2015

UNI EN ISO 9001/2008

IEC 60947

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YYTL

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