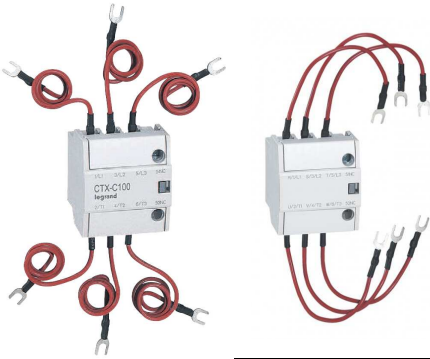


## CTX<sup>3</sup> Capacitor switching units

Cat. N°(s) : 4 168 74 / 75 / 76 / 77



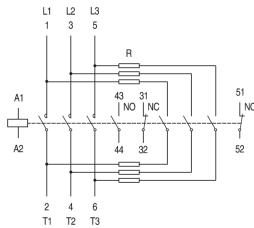
CONTENTS	PAGES
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4. Installation - Connection .....	2
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### 1. DESCRIPTION - USE

. Auxiliary blocks for capacitors switching are installed directly on CTX<sup>3</sup> 3P, 9 to 100 [A] contactors. With their discharge resistors, they reduce current peaks during capacitor banks switching.

#### Symbol:

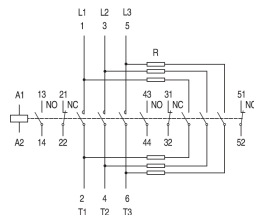
. For CTX<sup>3</sup> 22 3P 9~22 [A]



. For CTX<sup>3</sup> 40 3P 32~40 [A]

. For CTX<sup>3</sup> 65 3P 50~65 [A]

. For CTX<sup>3</sup> 100 3P 75~100 [A]



#### Technology:

. Damping resistor.

### 2. RANGE OF COMPATIBLE CONTACTORS

#### Number of Poles:

. Triple pole (3P).

#### Rated current - I<sub>e</sub>:

. 9A, 12A, 18A, 22A, 32A, 40A, 50A, 65A, 75A, 85A, 100A.

### 2. RANGE (suite)

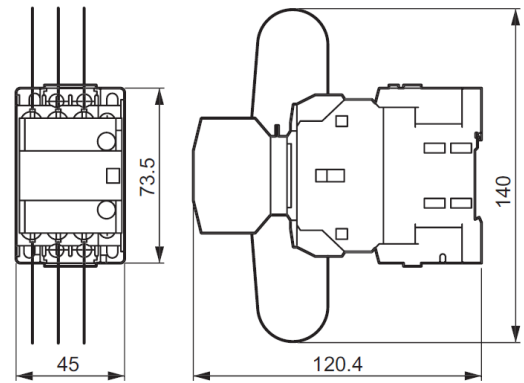
#### Rated Voltage / Frequency:

. 690 V, 50 / 60 Hz with standard tolerances.

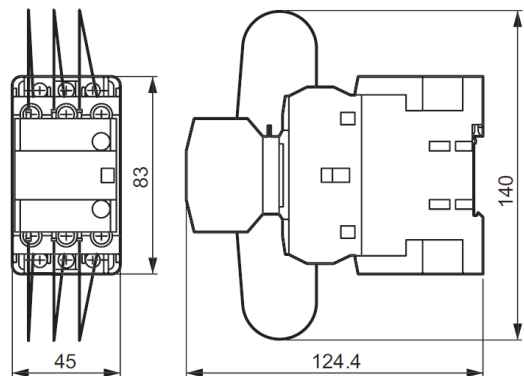
### 3. OVERALL DIMENSIONS

. Contactors equipped with CTX<sup>3</sup> switching units  
Dimension are applicable for AC controlled contactors

- For CTX<sup>3</sup> 22 3P 9~22 [A] - cat n° 4 168 74.

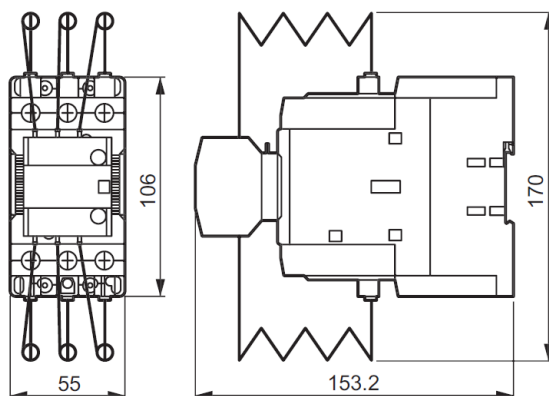


- For CTX<sup>3</sup> 40 3P 32~40 [A] - cat n° 4 168 74.

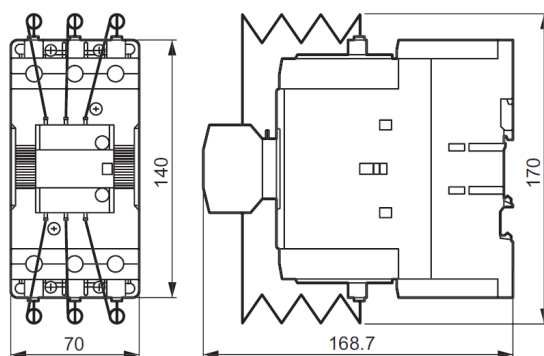


### 3. OVERALL DIMENSIONS *(continued)*

. For CTX<sup>3</sup> 65 3P 50~65 [A] - cat n° 4 168 75 and 4 168 76.



. For CTX<sup>3</sup> 100 3P 75~100 [A] - cat n° 4 168 76 and 4 168 77.



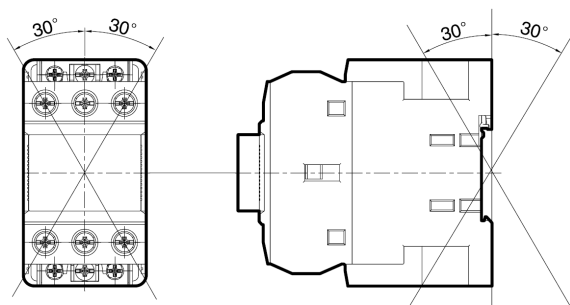
### 4. INSTALLATION - CONNECTION

#### Fixing:

- . Mounting on DIN rail or on plate.
- . 35 [mm] DIN rail for CTX<sup>3</sup> 22~CTX<sup>3</sup> 100.

#### Operating position:

- .  $\pm 30$  [°] possible, in relation to normal vertical mounting plane.
























#### Supply:

- . Either from the top or the bottom.

4. INSTALLATION - CONNECTION (continued)

Wire size and tightening torque:

Wire type		Main Terminal Size								Torque		
			(AWG / mm <sup>2</sup> )							mm(max)	[lb-in]	[Nm]
CTX <sup>3</sup> 22 - 9A		M4	18~10 / 1~6		18~10 / 1~6		18~10 / 1~6		9.6	20	2.25	23
CTX <sup>3</sup> 22 - 12A			18~10 / 1~6		16~10 / 1~6		16~10 / 1~6					
CTX <sup>3</sup> 22 - 18A			18~10 / 1~6		16~8 / 1.5~10		16~8 / 1.5~10					
CTX <sup>3</sup> 22 - 22A			18~10 / 1~6		14~8 / 2.5~10		14~8 / 2.5~10					
CTX <sup>3</sup> 40 - 32A		M5	18~10 / 1~6		12~8 / 2.5~10		12~8 / 2.5~10		12.8	20	2.25	23
CTX <sup>3</sup> 40 - 40A			18~10 / 1~6		8~6 / 10~16		8~6 / 10~16					
CTX <sup>3</sup> 65 - 50A		M6	-		10~4 / 6~25		10~4 / 6~25		14	35	4	41
CTX <sup>3</sup> 65 - 65A			-		8~3 / 10~35		8~3 / 10~35					
CTX <sup>3</sup> 100 - 75A		M8	-		8~2 / 10~35		8~2 / 10~35		17	45	5.1	52
CTX <sup>3</sup> 100 - 85A			-		8~1/0 / 10~50		8~1/0 / 10~50					
CTX <sup>3</sup> 100 - 100A			-		8~2/0 / 10~70		8~2/0 / 10~70					
CTX <sup>3</sup> 22~100 Aux./Coil		M4	20~14 / 0.5~2.5		18~12 / 0.75~2.5		18~12 / 0.75~2.5		7.6	15	1.75	18

WIRE TYPE									TORQUE	
		(AWG / mm <sup>2</sup> )							mm (Max)	[lb-in]
CTX <sup>3</sup> 65		0.75~35 / 18~2	0.75~25 / 18~4	0.75~35 / 18~2	0.75~25 / 18~4	0.75~25 / 18~4	0.75~16 / 18~6	---	35	4
CTX <sup>3</sup> 100		2.5~70 / 12~2	2.5~50 / 12~1	2.5~70 / 12~2	2.5~50 / 12~1	2.5~50 / 12~2	2.5~35 / 10~2	---	45	5.1

Type of conductors:

. Conductor type = 50/75°C Cu-wire only.

Tools required:

- . Pozidriv N°2 screwdriver recommended.
- . Flat screwdriver Ø5 to Ø6 [mm] Maximum.
- . Hexagonal key to CTX<sup>3</sup> 100 only (cage terminals).
- . Flat spanner for M6 bolt (CTX<sup>3</sup> 65).
- . Flat spanner for M8 bolt (CTX<sup>3</sup> 100).

## 5. GENERAL CHARACTERISTICS

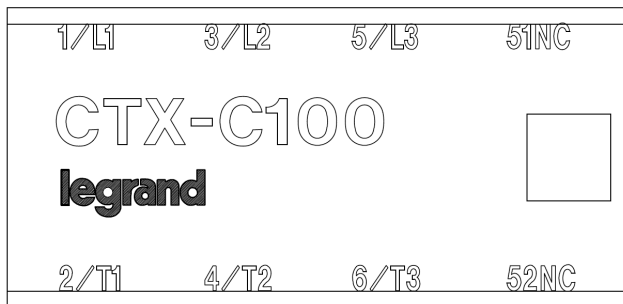
### Front side:

. By dark grey laser or pad printing:

- Brand: Legrand
- Range: CTX-C
- Marking power terminals
- Marking auxiliary terminals

### CTX<sup>3</sup> Capacitor switching units: (Example of marking)

- For CTX<sup>3</sup> 100 3P 75~100 [A] - cat n° 4 168 77.



### Left side:

. By identification label (referring to IEC standard)

**legrand** 4 168 77

**CTX-C100**

IEC 60947  
EN 60947  
VDE 0660  
BS 5424

UL US 6T21  
LISTED IND.CONTED.

CE

Terminal diagram showing connections for A1, A2, 13, 21, 14, 22, 2/L1, 4/L2, 6/L3, 43, 31, 51, 52, 2/T1, 4/T2, 6/T3, 44, 32.

AC6b

Contactor	Maximum Power (Kvar)	Torque(lbin)		AWG
	220~240V	400~440V	500~550V	
4 161 BX 4 161 9X	29.7	54	78	45
4 162 0X 4 162 1X	35	60	92	45
4 162 2X 4 162 3X	37	62	94	45

60/75°C Cu-wire only    Aux.Cont. A600/P600

R29985ZH00000  
79611613216

## 5. GENERAL CHARACTERISTICS (continued)

### Features of capacitor unit: (Pre-loading resistor)

- . Damping resistor that can limit the inrush current up to 60 x I<sub>n</sub> by closing earlier than the main contacts of the contactor.
- . Eliminates the switching surge.
- . Improves the performance of the capacitor system.

### Operation sequence:

Capacitor unit : OFF  
Contactor : OFF

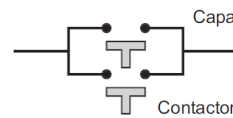


Fig.1

Capacitor unit : ON  
Contactor : OFF

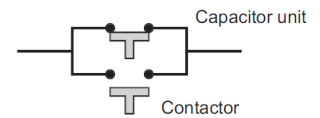


Fig.2

Capacitor unit : OFF  
Contactor : ON

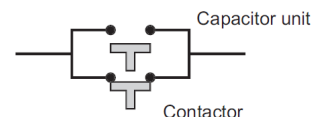


Fig.3

. Closing sequence:

- Fig.1 => Fig.2 => Fig.3

. Opening sequence:

- Fig.3 => Fig.1

### Rated operational voltage:

. U<sub>e</sub> = 690 [V] for all products.

### Rated impulse voltage and rated insulation voltage:

Type of products	Rated impulse voltage (U <sub>imp</sub> )	Rated insulation voltage (U <sub>i</sub> )
CTX <sup>3</sup> 22	6 [kV]	690 [V]
CTX <sup>3</sup> 40	8 [kV]	1 000 [V]
CTX <sup>3</sup> 65	8 [kV]	1 000 [V]
CTX <sup>3</sup> 100	8 [kV]	1 000 [V]
CTX <sup>3</sup> 150	8 [kV]	1 000 [V]

5. GENERAL CHARACTERISTICS (continued)

Electrical endurance:

Type of products	Electrical durability (operating cycles)	Maxi operating rate in operating cycles per hour
All frames	100 000	120

Weight:

CTX <sup>3</sup> Capacitor switching units	
References	Weight
4 168 74	0.096 [kg]
4 168 75	0.131 [kg]
4 168 76	0.131 [kg]
4 168 77	0.150 [kg]

Ambient operating temperature:

. Min. = -25°C. Max. = +55°C.

Derating of products depending on the ambient temperature:

		Ambient temperature			
		≤ 40 [°C] ≤ 104 [°F]	≤ 55 [°C] ≤ 131 [°F]	≤ 65 [°C] ≤ 149 [°F]	≤ 70 [°C] ≤ 158 [°F]
CTX <sup>3</sup> 3P 22 - 9A	Operational current (AC1) [A]	25	25	20	17
CTX <sup>3</sup> 3P 22 - 12A		25	25	20	17
CTX <sup>3</sup> 3P 22 - 18A		40	40	32	28
CTX <sup>3</sup> 3P 22 - 22A		40	40	32	28
CTX <sup>3</sup> 3P 40 - 32A		50	50	40	35
CTX <sup>3</sup> 3P 40 - 40A		60	60	50	42
CTX <sup>3</sup> 3P 65 - 50A		70	70	56	49
CTX <sup>3</sup> 3P 65 - 65A		100	100	80	70
CTX <sup>3</sup> 3P 100 - 75A		110	110	88	77
CTX <sup>3</sup> 3P 100 - 85A		135	135	108	94
CTX <sup>3</sup> 3P 100 - 100A		160	160	128	112
CTX <sup>3</sup> 3P 150 - 130A		160	160	130	110
CTX <sup>3</sup> 3P 150 - 150A		210	210	170	145

Ambient storage temperature:

. Min. = -50°C. Max. = +80°C.

Indice de protection: (Conformément à la norme IEC 60 529)

. IP20.

**5. GENERAL CHARACTERISTICS** *(continued)*

**Maximum operating altitude:**

. 3000 [m].

**Déclassement en altitude:**

. Coefficients de compensation à des altitudes supérieures à 1000 [m]:

Type	ANSI C37 30-1971			BS2692 PT1-1971/IEC Pub.282-1-1985			
	Rated insulation voltage	Rated current flow of current	Surrounding temperature	Voltage resistance test voltage	Rated insulation voltage	Rated current flow current	Temperature rise
1000	1.00	1.00	1.00	1.0	1.0	1.0	1.0
1200	0.98	0.995	0.992	↑ proportional	↑ proportional	↑ proportional	↑ proportional
1500	0.95	0.99	0.980	1.05	0.95	0.99	0.98
1800	0.92	0.985	0.968	↑ proportional	↑ proportional	↑ proportional	↑ proportional
2100	0.89	0.98	0.956				
2400	0.86	0.97	0.944				
2700	0.83	0.965	0.932				
3000	0.80	0.96	0.920				
3600	0.75	0.95	0.896	1.25	0.80	0.96	0.92
4200	0.70	0.935	0.872	/	/	/	/
4800	0.65	0.925	0.848				
5400	0.61	0.91	0.824				
6000	0.56	0.90	0.800				

5. GENERAL CHARACTERISTICS (continued)

Selection Table for CTX<sup>3</sup> contactors for capacitor banks:

Power (At 400 [V])	Coil voltage	Terminals	Without detuned reactors				With detuned reactors	
			With 3 terminals Alpivar <sup>3</sup> & Alpican		With 6 terminals Alpivar <sup>3</sup> (wiring inside Δ)		With 3 terminals Alpivar <sup>3</sup> & Alpican	With 6 terminals Alpivar <sup>3</sup> (wiring inside Δ)
			Contactors	Capacitor switching units	Contactors	Capacitor switching units	Contactors	Contactors
7,5 [Kvar]	24 [V]	Screw terminals	416080	416874	416080	416874	416090	416080
	110 [V]		416084		416084		416094	416084
	230 [V]		416086		416086		416096	416086
	415 [V]		416089		416089		416099	416089
12,5 [Kvar]	24 [V]	Screw terminals	416090	416874	416090	416874	416100	416090
	110 [V]		416094		416094		416104	416094
	230 [V]		416096		416096		416106	416096
	415 [V]		416099		416099		416109	416099
20 [Kvar]	24 [V]	Screw terminals	416120	416874	416110	416874	416120	416100
	110 [V]		416124		416114		416124	416104
	230 [V]		416126		416116		416126	416106
	415 [V]		416129		416119		416129	416109
25 [Kvar]	24 [V]	Screw terminals	416120	416874	416110	416874	416130	416100
	110 [V]		416124		416114		416134	416104
	230 [V]		416126		416116		416136	416106
	415 [V]		416129		416119		416139	416109
30 [Kvar]	24 [V]	Screw terminals	416130	416874	416120	416874	416140	416110
	110 [V]		416134		416124		416144	416114
	230 [V]		416136		416126		416146	416116
	415 [V]		416139		416129		416149	416119
40 [Kvar]	24 [V]	Screw terminals	416140	416875	416130	416874	416160	416130
	110 [V]		416144		416134		416164	416134
	230 [V]		416146		416136		416166	416136
	415 [V]		416149		416139		416169	416139
	24 [V]	Cage terminals	416150	416876	416150	416876	416170	416150
	110 [V]		416154		416154		416174	416154
	230 [V]		416156		416156		416176	416156
	415 [V]		416159		416159		416179	416159
50 [Kvar]	24 [V]	Screw terminals	416180	416877	416140	416875	416180	416130
	110 [V]		416184		416144		416184	416134
	230 [V]		416186		416146		416186	416136
	415 [V]		416189		416149		416189	416139
	24 [V]	Cage terminals	416190	416876	416150	416876	416190	416150
	110 [V]		416194		416154		416194	416154
	230 [V]		416196		416156		416196	416156
	415 [V]		416199		416159		416199	416159

5. GENERAL CHARACTERISTICS (continued)

Selection Table for CTX<sup>3</sup> contactors for capacitor banks: (continued)

Power (At 400 [V])	Coil voltage		Terminals	Without detuned reactors				With detuned reactors															
				With 3 terminals Alpivar <sup>3</sup> & Alpican		With 6 terminals Alpivar <sup>3</sup> (wiring inside Δ)		With 3 terminals Alpivar <sup>3</sup> & Alpican	With 6 terminals Alpivar <sup>3</sup> (wiring inside Δ)														
				Contactors	Capacitor switching units	Contactors	Capacitor switching units	Contactors	Contactors														
60 [Kvar]	24 [V] 110 [V] 230 [V] 415 [V]	Screw terminals	416220 416224 416226 416229	416877	416180 416184 416186 416189	416877	416200 416204 416206 416209	416160 416164 416166 416169															
									24 [V] 110 [V] 230 [V] 415 [V]	Cage terminals	416230 416234 416236 416239	416876	416190 416194 416196 416199	416876	416210 416214 416216 416219	416170 416174 416176 416179							
																	24 [V] 100-240 [V] AC 100-220 [V] DC 400-440 [V]	Screw terminals	NA	416180 416184 416186 416189	416877	416240 416246 416249	416160 416164 416166 416169
	24 [V] 100-240 [V] AC 100-220 [V] DC 400-440 [V]	Screw terminals	NA	416220 416224 416226 416229	416877	416260 416266 416269	416240 416246 416249																
								24 [V] 100-240 [V] AC 100-220 [V] DC 400-440 [V]	Cage terminals	NA	416230 416234 416236 416239	416876	416270 416276 416279	416250 416256 416259									



**5. GENERAL CHARACTERISTICS** *(continued)*

**Rating:** In accordance with IEC 60 947-4-1 AC 6b -  $\theta \leq 55$  [°C]

. For CTX<sup>3</sup> 3P with Capacitor switching units

CTX <sup>3</sup> Capacitor switching units	Type of Contactors	Maximum operating power						Max. peak current  [A]
		220 ~ 240 [V]		400 ~ 440 [V]		500 ~ 550 [V]		
		[kVar]	[A]	[kVar]	[A]	[kVar]	[A]	
4 168 74	CTX <sup>3</sup> 22 3P 9 [A]	5	13	9.7	14	14	16	500
	CTX <sup>3</sup> 22 3P 12 [A]	6.7	18	12.5	18	18	21	560
	CTX <sup>3</sup> 22 3P 18 [A]	8.5	22	16.7	24	24	28	850
	CTX <sup>3</sup> 22 3P 22 [A]	10	26	18	26	26	30	1600
	CTX <sup>3</sup> 40 3P 32 [A]	15	39	25	36	36	42	1800
	CTX <sup>3</sup> 40 3P 40 [A]	20	52	33.3	48	48	55	2000
4 168 75	CTX <sup>3</sup> 65 3P 50 [A]	20	52	40	58	58	67	2100
4 168 76	CTX <sup>3</sup> 65 3P 65 [A]	25	66	45.7	66	66	76	3000
4 168 77	CTX <sup>3</sup> 100 3P 75 [A]	29.7	78	54	78	78	90	3050
	CTX <sup>3</sup> 100 3P 85 [A]	35	92	60	87	92	106	3050
	CTX <sup>3</sup> 100 3P 100 [A]	37	97	62	89	94	109	3050

. When the switch is closed capacitor must be discharged before recharged (Maxi. residual voltage at terminal  $\leq 50$  [V]).

. To prevent short current, gG type fuse must be 1.5 - 2 times than rated current/

**6. CONFORMITIES AND APPROVALS**

**Compliance to standards:**

. Standards references:

- IEC/EN 60 947-1
- IEC/EN 60 947-4-1
- UL 508.

. Certifications: CE, UL.