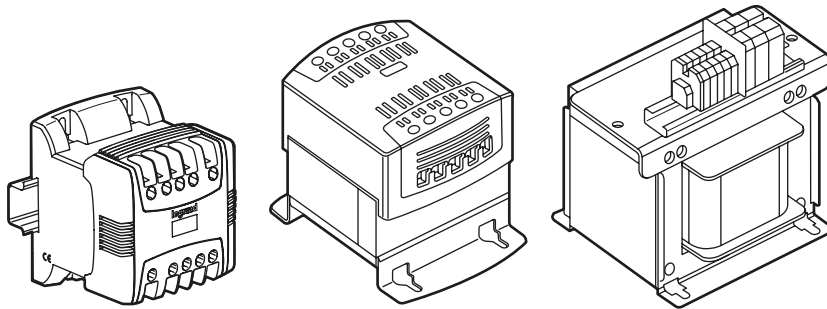


# Single-phase control and signaling transformer

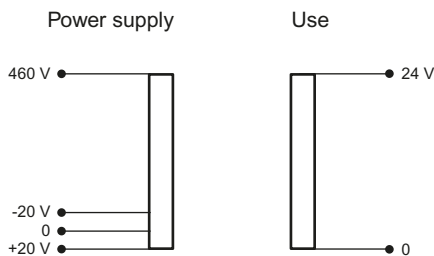
Cat. Nos.: 0 442 41/42/43/44/45/46/47/48/49/50  
0 442 81/82/83/84/85/86/87/88/89/90/91



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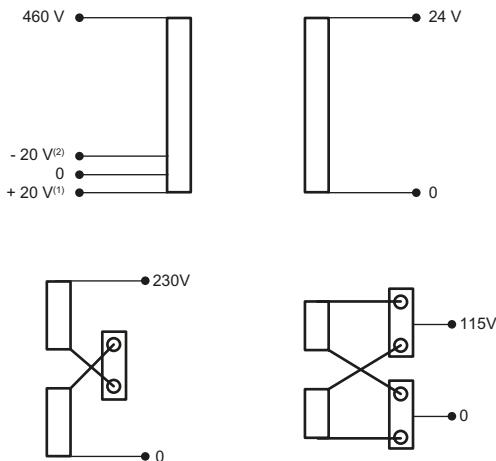
## 1. OPERATING PRINCIPLE

This transformer is intended to supply control and signalling equipment housed inside an enclosure (contactors, relays, automation systems, etc...).



Certain equipment needs to be supplied with a specific voltage.

Transformers are fitted with adjustment taps of + and - 20 V on the terminal strip of the primary circuit, to adjust the secondary voltage, which is influenced by the voltage of the power supply network and/or by a device under-loaded.



(1) Up terminal: 480 V or load lower than the rated power,  
(2) Up terminal: 440 V or load lower than the rated power.

## 2. GENERAL CHARACTERISTICS

Single-phase 50-60 Hz class I.  
IP2x up to 400 VA without connection strip  
IP 00 with connection strip - IK 04.  
Insulation voltage between windings: 4680 V.  
Maximum ambient operating temperature: 50° C.  
Protected against involuntary or accidental contacts with live parts up to 1000 VA.

### 2.1 Conformities

Conform to IEC EN 61558-2-2 and 2-4 or 2-6.  
UL 5085 / CSA C22-2 n°66 agreements c us.  
Products suitable for the construction of equipment compliant with EN 61131-2, EN 60204-1 and EN 60439-1.  
Marking

### 2.2 Transformer protection

Transformers can be protected by a gG type fuse or by a C type circuit-breaker.  
Supplied with a connecting strip 0 V / earth up to 1000 VA.

### 2.3 Casing

Covered up to 1000 VA.  
Bare as from 1600 VA.

#### 2.3.1 Cover

Polyamide 6/6.  
RAL 7 035.  
Information : Laser-engraved on the front face cover guaranteeing indelibility :  
- product Cat. No.,  
- voltages,  
- rated power / instantaneous power,  
- protection device rating (fuses or circuit-breakers),  
- compliances and agreements,  
- terminal strip marking.

Front face : flat surface 25 x 10 mm allowing marking by:  
- labels or adhesive label holders,  
- inscription : manual,  
- .....

#### 2.3.2 base

- 40 to 400 VA: polyamide 6/6, glass-filled, flame-retardant fixing by screws or clips up to 250 VA on rail ,  
- 400 VA fixing by screw only,  
- 630 to 1000 VA: metal base with epoxy-polyester coating RAL 7 000,  
- 1600 to 8000 VA: metal base with anti-corrosion coating.

# Single-phase control and signaling transformer

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## 2. GENERAL CHARACTERISTICS (continued)

### 2.3 Casing (continued)

#### 2.3.3 Circuit

In silicon magnetic steel sheet.  
Coating: matte black paint as from 630 VA.

#### 2.3.4 Connection terminal strip

- 40 VA to 400 VA: terminal fitted with a cable clamp plate with slotted cross-head type Z screw.
- from 630 VA to 1000 VA: cage terminals with slotted cross-head type Z screw.
- 1600 to 8000 VA: connection to Viking terminal block.

## 3. RANGE

Primary 460 V ± 20 V (440 - 460 - 480)

Secondary 24 V - 115 / 230 V

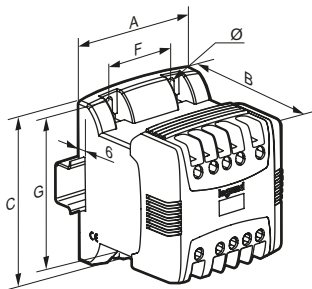
Power according to IEC and CSA	Prim: 460 ± 20 V Sec: 24 V	Prim: 460 ± 20 V Sec: 115/230 V
40 VA	0 442 41	0 442 81
63 VA	0 442 42	0 442 82
100 VA	0 442 43	0 442 83
160 VA	0 442 44	0 442 84
250 VA	0 442 45	0 442 85
400 VA	0 442 46	0 442 86
630 VA	0 442 47	0 442 87
1000 VA	0 442 48	0 442 88
1600 VA	0 442 49	0 442 89
2500 VA	0 442 50	0 442 90
4000 VA	-	0 442 91

Interference filtering.

## 4. MECHANICAL CHARACTERISTICS

### 4.1 Mechanical characteristics

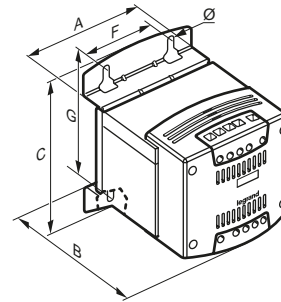
#### 4.1.1 Transformers 40 - 63 - 100 - 160 - 250 - 400 VA



Catalogue number	Power (VA)	Dimensions (mm)			Fixing (mm)			Weight (Kg)
		A	B	C	F	G	Diameter	
0 442 41/81	40	94	78	113	50	100	5.2	1.23
0 442 42/82	63	94	85	113	50	100	5.2	1.56
0 442 43/83	100	94	94	113	50	100	5.2	1.94
0 442 44/84	160	94	112	113	50	100	5.2	2.6
0 442 45/85	250	106	123	115	50	100	5.2	3.82
0 442 46/86	400	120	140	140	62.5	125	5.2	5.62

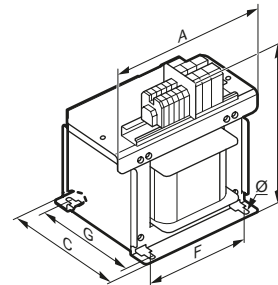
(1) Reminder: transformers 40 - 63 - 100 - 160 - 250 VA can also be fixed on rail 3 L.

#### 4.1.2 Transformers 630 - 1000 VA



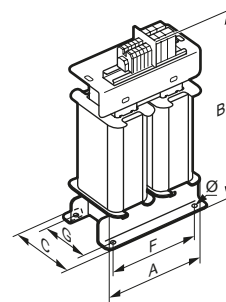
Catalogue number	Power (VA)	Dimensions (mm)			Fixing (mm)			Weight (Kg)
		A	B	C	F	G	Diameter	
0 442 47/87	630	132	155	175	75	150	5.5	8
0 442 48/88	1000	150	199	206	100	175	7	14.9

#### 4.1.3 Transformers 1600 - 2500 VA



Catalogue number	Power (VA)	Dimensions (mm)			Fixing (mm)			Weight (Kg)
		A	B	C	F	G	Diameter	
0 442 49/89	1600	220	245	191	150	153	9	25.6
0 442 50/90	2500	260	292	171	200	124	9	30

#### 4.1.4 Transformer 4000 VA



Catalogue number	Power (VA)	Dimensions (mm)			Fixing (mm)			Weight (Kg)
		A	B	C	F	G	Diameter	
0 442 91	4000	230	340	205	180	130	11	31

# Single-phase control and signaling transformer

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## 4. MECHANICAL CHARACTERISTICS (continued)

### 4.2 Connection

Power VA	Secondary	Connection PRI Cable mm <sup>2</sup>		Connection SEC Cable mm <sup>2</sup>	
		Flexible	Rigid	Flexible	Rigid
40	115 / 230 V 24 V	1 to 4	1 to 4	1 to 4	1 to 4
63	-	1 to 4	1 to 4	1 to 4	1 to 4
100	-	1 to 4	1 to 4	1 to 4	1 to 4
160	-	1 to 4	1 to 4	1 to 4	1 to 4
250	-	1 to 4	1 to 4	1 to 4	1 to 4
400	-	1 to 4	1 to 4	1 to 4	1 to 4
630	115 / 230 V	1 to 4	1 to 4	1 to 4	1 to 4
	24 V	1 to 4	1 to 4	1 to 10	1 to 10
1000	-	1 to 16	1 to 16	1 to 16	1 to 16
1600	115 / 230 V	2.5 to 10	1.5 to 16	2.5 to 10	1.5 to 16
	24 V	2.5 to 10	1.5 to 16	-	70
2500	115 / 230 V	2.5 to 10	1.5 to 16	2.5 to 10	1.5 to 16
	24 V	4 to 16	1.5 to 25	-	70
4000	115 / 230 V	4 to 16	1.5 to 25	4 to 16	1.5 to 25

## 5. DETERMINATION OF TRANSFORMER'S POWER

### 5.1 Determination of transformer power

Start with the inrush power calculated previously and use the table below.

Control and safety transformer (24 V),  
Primary 460 V ± 20 V - Secondary 24 V.

Catalogue number	Power (VA)	P.I.A to cos φ of								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
0 442 41	40	63	60	58	55	50	48	48	49	60
0 442 42	63	110	102	94	90	83	79	77	78	91
0 442 43	100	200	180	160	150	140	130	130	130	150
0 442 44	160	400	340	300	270	230	220	210	210	230
0 442 45	250	550	490	450	420	400	380	370	370	430
0 442 46	400	1800	1300	1100	870	800	700	600	600	500
0 442 47	630	2200	1700	1400	1000	960	900	820	760	720
0 442 48	1000	3400	2800	2400	2000	1800	1600	1500	1320	1200
0 442 49	1600	12800	10900	9500	9100	8500	8100	6700	6400	6600
0 442 50	2500	4300	3900	3600	3300	3100	3000	2900	2900	3400

Control and isolating transformer,  
Primary 460 V ± 20 V - Secondary 115 / 230 V.

Catalogue number	Power (VA)	P.I.A to cos φ of								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
0 442 81	40	64	60	57	53	50	47	46	47	57
0 442 82	63	120	110	100	92	82	78	76	76	90
0 442 83	100	200	180	160	150	140	140	130	130	150
0 442 84	160	330	300	270	250	240	230	220	220	250
0 442 85	250	560	510	460	450	410	390	380	370	430
0 442 86	400	2200	1700	1400	1220	1000	910	830	760	730
0 442 87	630	2300	1800	1500	1300	1100	1000	910	840	810
0 442 88	1000	7300	5800	4900	4200	3700	3400	3100	2900	2800
0 442 89	1600	9700	8700	7500	6700	6400	5400	4700	4500	4400
0 442 90	2500	8700	7300	6300	5600	5000	4600	4300	4200	4100
0 442 91	4000	16500	14300	13700	12800	10500	9800	9200	8900	9500

### 5.2 Checking

Check that the transformer's power is at least equal to the sum of the contactors' and indicator lights' holding powers when powered up simultaneously.

## 6. ELECTRICAL CHARACTERISTICS

Catalogue number	Power (VA)	No-load losses (w)	Total losses at full load iron + copper	Drop voltage (%) to cos φ of			Efficiency (%) to cos φ of			Ucc %
				0,3	0,6	1	0,3	0,6	1	
0 442 41	40	3.9	7.3	8.7	10.5	8.5	62	77	84	10.0
0 442 42	63	6.0	14.2	7.5	9.4	8.5	57	73	82	9.0
0 442 43	100	8.2	15.1	7.3	9.3	8.9	66	80	87	8.9
0 442 44	160	11.2	24.6	5.8	7.6	7.7	66	80	87	7.2
0 442 45	250	14.9	31.4	5.2	6.6	6.2	70	83	89	6.1
0 442 46	400	18.3	46.3	2.1	3.7	5.6	72	84	90	4.2
0 442 47	630	25.5	81	2.3	4.0	4.7	70	82	89	3.8
0 442 48	1000	44.2	74.4	1.3	1.9	2.9	80	89	93	2.4
0 442 49	1600	65.5	94.7	1.1	1.6	1.9	84	91	94	1.7
0 442 50	2500	86.5	143.4	1.8	2.2	2.0	84	91	95	1.9

Catalogue number	Power (VA)	No-load losses (w)	Total losses at full load iron + copper	Drop voltage (%) to cos φ of			Efficiency (%) to cos φ of			Ucc %
				0,3	0,6	1	0,3	0,6	1	
0 442 81	40	3.9	7.4	8.7	10.5	8.8	62	76	84	10.1
0 442 82	63	6.0	11.8	7.6	9.6	8.9	62	76	84	9.2
0 442 83	100	8.2	17.3	7.2	9.2	8.6	63	78	85	8.7
0 442 84	160	11.2	23.4	5.8	7.4	7.1	67	80	87	6.9
0 442 85	250	14.9	31.7	5.2	6.6	6.2	70	83	89	6.1
0 442 86	400	18.3	43.9	2.1	3.6	4.8	73	85	90	3.8
0 442 87	630	25.5	76	2.1	3.5	4.6	71	83	89	3.4
0 442 88	1000	44.2	73.6	1.3	2.0	2.7	80	89	93	2.2
0 442 89	1600	65.5	95.3	1.1	1.5	1.8	83	91	94	1.5
0 442 90	2500	86.5	150.1	1.8	2.3	2.2	83	91	94	1.7
0 442 91	4000	87.4	234.8	2.1	2.9	3.3	84	91	94	2.7

Duration of the admissible installed power: 50 ms.

Secondary	Cat. No.:	Max. on-load dissipated powers (watts)	Admissible instantaneous power at cos φ 05	Power in VA according to UL
24 V	0 442 41	7.5	55	40
	0 442 42	14.3	90	63
	0 442 43	17.9	150	100
	0 442 44	25	270	140
	0 442 45	31.6	420	210
	0 442 46	46.3	870	300
	0 442 47	81	1000	450
	0 442 48	73.9	2000	700
	0 442 49	94.7	9100	700
	0 442 50	144	3300	1400
115/230 V	0 442 81	7.4	53	40
	0 442 82	11.8	92	63
	0 442 83	17.3	150	100
	0 442 84	23.4	250	140
	0 442 85	31.7	450	210
	0 442 86	43.9	1220	300
	0 442 87	76	1100	450
	0 442 88	73.6	4200	700
	0 442 89	95.3	6700	700
	0 442 90	150.1	5600	1300
0 442 91	234.8	12800	2400	

# Single-phase control and signaling transformer

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## 6. ELECTRICAL CHARACTERISTICS (continued)

LINE PROTECTION:

Min. rating of protections for primary supply of.

Power	460 V single phase / aM type cart fuse
40 VA	13092 / 0.25 A
63 VA	13095 / 0.5 A
100 VA	13001 / 1 A
160 VA	13001 / 1 A
250 VA	13002 / 2 A
400 VA	13002 / 2 A
630 VA	13004 / 4 A
1000 VA	13004 / 4 A
1600 VA	13006 / 6 A
2500 VA	13010 / 10 A
4000 VA	13016 / 16 A

Technical characteristics of transformers at secondaries.

Rating power	24 V		115 V		230 V	
	Rating	M.C.B. Cat. No.	Rating	M.C.B. Cat. No.	Rating	M.C.B. Cat. No.
IEC and CSA						
40 VA	2	T2AL <sup>(1)</sup>	04	T0.4AL <sup>(1)</sup>	02	T0.2AL <sup>(1)</sup>
63 VA	3.15	T3.15AL <sup>(1)</sup>	0.63	T0.63 <sup>(1)</sup>	0.315	T0.315AL <sup>(1)</sup>
100 VA	4	4 076 95	1	4 076 92	0.5	4 076 91
160 VA	8	4 076 97	2	4 076 93	1	4 076 92
250 VA	10	4 076 98	2	4 076 93	1	4 076 92
400 VA	16	4 077 00	4	4 076 95	2	4 076 93
630 VA	25	4 077 02	6	4 076 96	3	4 076 94
1000 VA	40	4 077 04	8	4 076 97	4	4 076 95
1600 VA	63	4 077 90	13	4 076 99	8	4 076 97
2500 VA	100	4 092 29	20	4 077 01	10	4 076 98
4000 VA	-	-	32	4 077 03	16	4 077 00

(1) Fuses IEC 127 (cartridges 5 x 20 T type)  
T: time delay fuse  
L: low breaking capacity

## 7. CHARACTERISTICS OF INSULATING MATERIALS

Cover and base

Cover, polyamide 6/6 Ral 7 035.

Base, polyamide 6/6 glass filled Ral 7 000.

- operating temperature ..... - 30 to +100 °C,
- flame resistance UL94 NFT 51-072 ..... VO,
- resistance to glow wire test NFC 20-455 ..... 960 °C,
- tensile strength NFT 51-034 ..... 110 N/mm<sup>2</sup>,
- resistance to Charpy impact test NFT 51-035 ..... 33 kJ/m<sup>2</sup>,
- dielectric strength VDE 0303/2 ..... 20 kV/mm,
- tracking current resistance CEI 112 ..... 300 V,
- resistance to molds and tropical and fungi ..... good.

Resistance to chemicals at a temperature of 23° C,

+: excellent resistance 0: moderate resistance -: low resistance.

Acids:

- Mineral: hydrochloric 10% ..... 0
- sulphuric 10% ..... -
- nitric - all concentrations ..... -
- Organic: acetic 10% ..... 0
- formic 10% ..... -

Bases:

- Mineral ..... +
- Organic ..... +
- Oils ..... +
- Greases ..... +
- Oil products ..... +
- Chlorinated solvents ..... +
- Phenols ..... -
- Alcohols ..... +
- Hydrocarbons ..... +
- Mineral salts ..... +