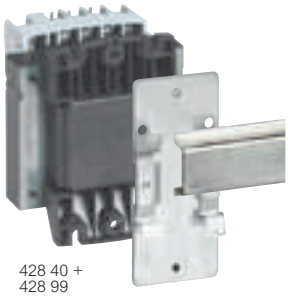
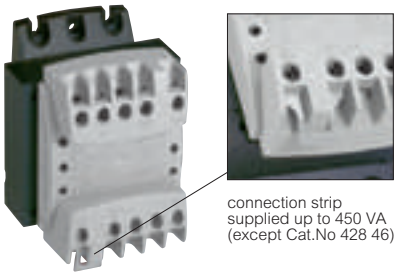
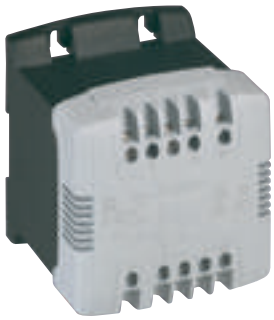
equipment transformers
single-phase


428 40 +
428 99



428 41
supplied with
connection strip


428 75


427 92

IP 2X or XXB up to 450 VA (up to 310 VA in 12-24 V) - IK 04
Clip on fixing possibility up to 160 VA with accessories Cat.No 044 16 or 428 99
Transformers with 2 secondary voltage supplied with coupling strip
Transformers up to 450 VA supplied with isolated strip for 0 V connection secondary / earth (except Cat.No 428 46)
Conform to IEC EN 61558-2-6 for 12 V and 24 V and conform to IEC EN 61558-2-4 for 48 V, 115 V and 230 V
Products suitable for building equipment conforming to standards EN 61131-2, EN 60204-1 and EN 60439-1

Safety

12 - 24 V
230-400 V (primary) / 12 - 24 V (secondary)

Pack	Cat.Nos	Power (VA)	Primary terminal flexible cable (mm²)	Secondary terminal flexible cable (mm²)
1	428 40	40	1 to 4	1 to 4
1	428 41	63	1 to 4	1 to 4
1	428 42	100	1 to 4	1 to 4
1	428 43	160	1 to 4	1 to 4
1	428 44	220	1 to 4	1 to 4
1	428 45	310	1 to 4	1 to 16
1	428 46	450	1 to 4	1 to 16
1	428 47	630	1 to 4	1 to 16
1	428 49	1000	0.25 to 6	4 to 35

Safety (24 V) or isolation (48 V)

24 - 48 V
230-400 V (primary) / 24 - 48 V (secondary)

Pack	Cat.Nos	Power (VA)	Primary terminal flexible cable (mm²)	Secondary terminal flexible cable (mm²)
1	428 70	40	1 to 4	1 to 4
1	428 71	63	1 to 4	1 to 4
1	428 72	100	1 to 4	1 to 4
1	428 73	160	1 to 4	1 to 4
1	428 74	220	1 to 4	1 to 4
1	428 75	310	1 to 4	1 to 4
1	428 76	450	1 to 4	1 to 4
1	428 77	630	1 to 4	1 to 16

Circuits isolation

115 - 230 V
230-400 V (primary) / 115 - 230 V (secondary)

Pack	Cat.Nos	Power (VA)	Primary terminal flexible cable (mm²)	Secondary terminal flexible cable (mm²)
1	427 85	40	1 to 4	1 to 4
1	427 86	63	1 to 4	1 to 4
1	427 87	100	1 to 4	1 to 4
1	427 88	160	1 to 4	1 to 4
1	427 89	220	1 to 4	1 to 4
1	427 90	310	1 to 4	1 to 4
1	427 91	450	1 to 4	1 to 4
1	427 92	630	1 to 4	1 to 4

Accessories



		For clip on rail (90° mounting) of transformers up to 160 VA with 2 claws
5	428 99	Plate
10	044 16	Claw witdh 10 mm Threaded hole For M4 screw

440 to 480 voltage on request

control and signalling transformers
single-phase

■ Dimensions

Fig. 1: 40 to 400 VA

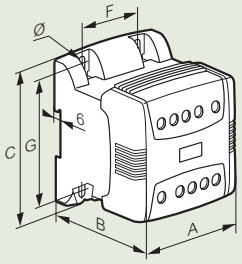


Fig. 2: 630-1000 VA

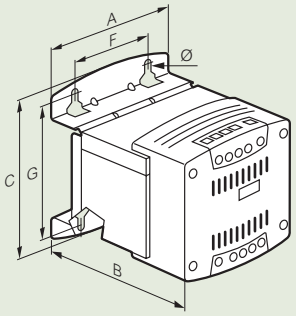


Fig. 3: 1600-2500 VA

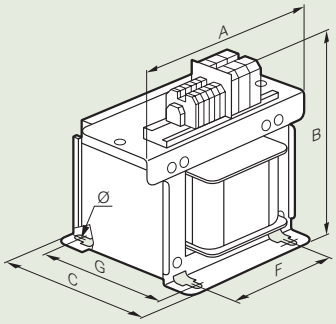
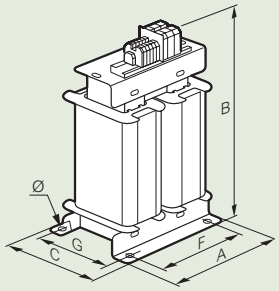


Fig. 4: 4000 to 8000 VA



Cat.Nos	Power (VA)	Fig.	Dimensions (mm)			Fixing(1)			Weight (Kg)
			A	B	C	F	G	Ø	
442 11/31/41/61/81	40	1	94	78	113	50	100	5.2	1.23
442 12/32/42/62/82	63	1	94	85	113	50	100	5.2	1.56
442 13/33/43/63/83	100	1	94	94	113	50	100	5.2	1.95
442 14/34/44/64/84	160	1	94	112	113	50	100	5.2	2.6
442 15/35/45/65/85	250	1	106	123	115	50	100	5.2	3.82
442 16/36/46/66/86	400	1	120	140	140	62.5	125	5.2	5.62
442 17/37/47/67/87	630	2	132	155	175	75	150	5.5	8
442 18/38/48/68/88	1000	2	150	199	206	100	175	7	14.9
442 39/49/69/89	1600	3	220	245	191	150	153	9	25.6
442 40/50/70/90	2500	3	300	292	171	200	114	9	33.1
442 71/91	4000	4	230	340	205	180	130	11	31
442 72	5000	4	240	390	205	180	130	11	40
442 73	6300	4	240	390	205	180	130	11	45
442 74	8000	4	240	390	280	180	140	11	64

(1) Direct fixing possibility on symmetrical rail ⎓ up to 250 VA

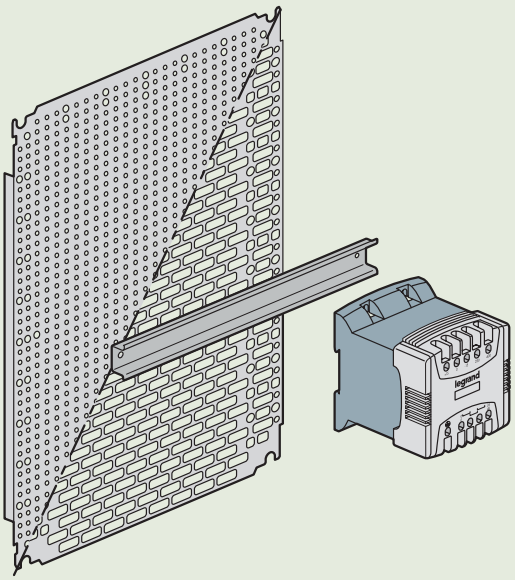
■ Associated protection

Nominal power (VA) acc. to IEC and CSA	24 V		48 V		115 V		230 V	
	Rating	MCBs Cat.Nos	Rating	MCBs Cat.Nos	Rating	MCBs Cat.Nos	Rating	MCBs Cat.Nos
40	2	T2AL(1)	1	T1AL(1)	0 4	T0.4AL(1)	0.2	T0.2AL(1)
63	3.15	T3.15AL(1)	1.6	T1.6AL(1)	0.63	T0.63AL(1)	0.315	T0.315AL(1)
100	4	063 91	2	063 89	1	063 88	0.5	063 86
160	8	063 93	4	063 91	2	063 89	1	063 88
250	10	063 94	6	063 92	2	063 89	1	063 88
400	16	063 96	8	063 93	4	063 91	2	063 89
630	25	063 98	13	063 95	6	063 92	3	063 90
1000	40	064 00	20	063 97	8	063 93	4	063 91
1600	63	064 74	32	063 99	13	063 95	8	063 93
2500	100	064 76	50	064 73	20	063 97	10	063 94
4000					32	063 99	16	063 96
5000					40	064 00	20	063 97
6300					50	064 73	25	063 98
8000					63	064 74	32	063 99

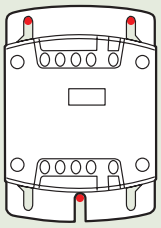
(1) Fuse IEC 127 (5x20 T type cartridge fuse) - T: Time - lag fuse - L: Low breaking capacity

■ Fixing

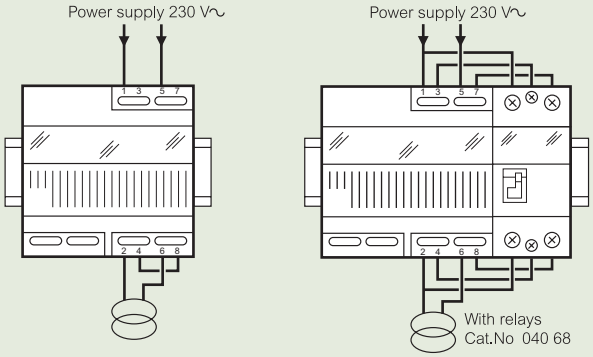
On perforated plates Lina 25 and on Lina 12.5 plates
On symmetrical rail ⎓ up to 250 VA
fixing centres pitch 25 mm up to 1000 VA



Attachment at 3 points possible with through oblong on the secondary side

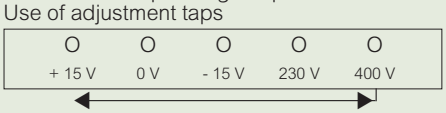


■ Wiring diagram for inrush current limiter Cat.No 442 96



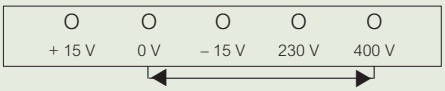
■ Characteristics

Single - phase 50-60 Hz - class I
Insulation voltage between windings: 4 510 V
Max. ambiant operating temperature without derating: 50 °C
Use of adjustment taps



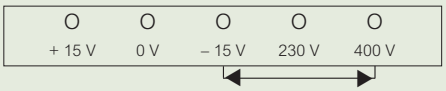
Connected to mains supply (U1) between terminals + 15 V and 230 or 400 V

1) If $U_1 > 230$ or 400 V
2) If $I_2 < I_{2n}$ (if load is lower than rated load, the secondary voltage must be reduced)



Connected to mains supply (U1) between terminals 0 V and 230 or 400 V

If $U_1 = 230$ or 400 V with a load $I_2 = I_{2n}$



Connected to mains supply (U1) between terminals - 15 V and 230 or 400 V

If $U_1 < 230$ or 400 V with a load $I_2 = I_{2n}$

Transformer sizing

P inrush = 0.8 (Σ Pm + Σ Pr + Pa)
Σ Pm = Sum of all contactors holding powers
Σ Pr = Sum of all indicators light powers
Pa = Inrush power of the largest contactor

Cat.Nos	Power (VA)	Admissible instantaneous power (VA) at cos φ of:									No-load loss (W)	Loss at rated voltage(1) (W)	Voltage drop (%) with cos φ of:			Efficiency (%) with cos φ of:			Ucc (%)	Connection			
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1			0.3	0.6	1	0.3	0.6	1		Primary cable (mm²)		Secondary cable (mm²)	
																				flexible	rigid	flexible	rigid
Primary 230-400 V ± 15 V - Secondary 24 V and Primary 230 V + 15 V - Secondary 24 V																							
442 11	40	62	57	53	50	48	47	46	47	58	3.9	7.5	8.9	10.8	8.9	62.0	76.0	84.0	10.3	1 to 4	1 to 4	1 to 4	1 to 4
442 12	63	110	100	94	88	83	80	78	78	91	6.0	14.3	7.6	9.5	8.6	57.0	73.0	81.0	9.1	1 to 4	1 to 4	1 to 4	1 to 4
442 13	100	230	210	180	170	150	140	140	130	150	8.2	17.9	6.3	8.6	9.2	63.0	77.0	85.0	8.5	1 to 4	1 to 4	1 to 4	1 to 4
442 14	160	340	300	270	250	230	220	210	210	230	11.2	25.0	5.9	7.8	7.9	66.0	79.0	86.0	7.4	1 to 4	1 to 4	1 to 4	1 to 4
442 15	250	550	490	450	420	400	380	370	370	430	14.9	31.6	5.2	6.6	6.2	70.0	83.0	89.0	6.1	1 to 4	1 to 4	1 to 4	1 to 4
442 16	400	1600	1200	1000	850	740	650	590	540	510	18.3	46.3	2.2	3.8	5.6	72.0	84.0	90.0	4.2	1 to 4	1 to 4	1 to 4	1 to 4
442 17	630	2700	2200	1800	1500	1300	1200	1100	1000	1000	24.1	53.7	2.0	3.3	4.6	78.0	88.0	92.0	3.7	1 to 16	1 to 16	1 to 16	1 to 16
442 18	1000	3400	2800	2300	2000	1800	1600	1500	1400	1300	44.2	73.9	1.3	2.1	2.8	80.0	89.0	93.0	2.3	1 to 16	1 to 16	1 to 16	1 to 16
Primary 230-400 V ± 15 V - Secondary 24-48 V																							
442 31	40	63	58	55	52	50	48	48	49	60	3.9	7.3	8.7	10.5	8.5	62.0	77.0	84.0	10.0	1 to 4	1 to 4	1 to 4	1 to 4
442 32	63	110	102	94	87	83	79	77	78	91	6.0	14.2	7.5	9.4	8.5	57.0	73.0	82.0	9.0	1 to 4	1 to 4	1 to 4	1 to 4
442 33	100	200	180	160	150	140	130	130	130	150	8.2	15.1	7.3	9.3	8.9	66.0	80.0	87.0	8.9	1 to 4	1 to 4	1 to 4	1 to 4
442 34	160	340	300	270	250	230	220	210	210	230	11.2	24.6	5.8	7.6	7.7	66.0	80.0	87.0	7.2	1 to 4	1 to 4	1 to 4	1 to 4
442 35	250	550	490	450	420	400	380	370	370	430	14.9	31.4	5.2	6.6	6.2	70.0	83.0	89.0	6.1	1 to 4	1 to 4	1 to 4	1 to 4
442 36	400	1400	1000	800	700	600	500	500	400	400	18.3	46.3	2.1	3.7	5.6	72.0	84.0	90.0	4.2	1 to 4	1 to 4	1 to 4	1 to 4
442 37	630	2700	2200	1900	1700	1500	1300	1200	1200	1200	24.1	49.4	2.0	3.0	3.9	79.0	88.0	93.0	3.3	1 to 16	1 to 16	1 to 16	1 to 16
442 38	1000	3400	2800	2300	2000	1800	1600	1500	1400	1300	44.2	74.4	1.3	1.9	2.9	80.0	89.0	93.0	2.4	1 to 16	1 to 16	1 to 16	1 to 16
442 39	1600	12800	10900	9500	8500	7700	7100	6700	6400	6600	65.5	94.7	1.1	1.6	1.9	84.0	91.0	94.0	1.7	2.5 to 10	1.5 to 16	4 to 16	1.5 to 25
442 40	2500	4300	3900	3600	3300	3100	3000	2900	2900	3400	86.5	143.4	1.8	2.2	2.0	84.0	91.0	95.0	1.9	4 to 16	1.5 to 25	4 to 35	2.5 to 50
Primary 230-400 V ± 15 V - Secondary 230 V and Primary 230-400 V + 15 V - Secondary 115-230 V																							
442 61	40	62	57	53	50	48	47	46	47	57	3.9	7.4	8.7	10.5	8.8	62.0	76.0	84.0	10.1	1 to 4	1 to 4	1 to 4	1 to 4
442 62	63	110	100	93	86	82	78	76	76	90	6.0	11.8	7.6	9.6	8.9	62.0	76.0	84.0	9.2	1 to 4	1 to 4	1 to 4	1 to 4
442 63	100	200	180	160	150	140	140	130	130	150	8.2	17.3	7.2	9.2	8.6	63.0	78.0	85.0	8.7	1 to 4	1 to 4	1 to 4	1 to 4
442 64	160	330	300	270	250	240	230	220	220	250	11.2	23.4	5.8	7.4	7.1	67.0	80.0	87.0	6.9	1 to 4	1 to 4	1 to 4	1 to 4
442 65	250	560	510	460	430	410	390	380	370	430	14.9	31.7	5.2	6.6	6.2	70.0	83.0	89.0	6.1	1 to 4	1 to 4	1 to 4	1 to 4
442 66	400	200	1600	1300	1100	900	840	760	700	660	18.3	43.9	2.1	3.6	5.2	73.0	85.0	90.0	4.1	1 to 4	1 to 4	1 to 4	1 to 4
442 67	630	2700	2200	1800	1600	1400	1200	1100	1000	1000	24.1	53.2	2.1	3.3	4.5	78.0	88.0	92.0	3.6	1 to 16	1 to 16	1 to 16	1 to 16
442 68	1000	3400	2800	2300	2000	1800	1600	1500	1400	1300	44.2	73.6	1.3	2.0	2.7	80.0	89.0	93.0	2.2	1 to 16	1 to 16	1 to 16	1 to 16
442 69	1600	8700	7500	6600	6100	5400	5000	4700	4500	4700	65.5	95.3	1.1	1.5	1.8	83.0	91.0	94.0	1.5	2.5 to 10	1.5 to 16	2.5 to 10	1.5 to 16
442 70	2500	9200	8300	7600	7100	6700	6300	6200	6100	7100	86.5	150.1	1.8	2.3	2.2	83.0	91.0	94.0	2.0	4 to 16	1.5 to 25	4 to 16	1.5 to 25
442 71	4000	16500	14300	12700	11400	10500	9800	9200	8900	9500	87.4	234.8	2.1	2.9	3.3	84.0	91.0	94.0	2.7	4 to 16	1.5 to 25	4 to 16	1.5 to 25
442 72	5000	28500	23400	19900	17500	15600	14200	13100	12300	12300	87.4	279.0	1.5	2.3	2.9	84.0	91.0	95.0	2.3	4 to 16	1.5 to 25	4 to 16	1.5 to 25
442 73	6300	19900	18300	17000	16000	15300	14800	14600	14800	17900	117.9	272.9	2.2	2.6	2.3	87.0	93.0	96.0	2.3	4 to 16	1.5 to 25	4 to 16	1.5 to 25
442 74	8000	44600	39200	35200	32100	29800	28000	26700	26100	28500	195.0	336.5	1.3	1.7	1.8	88.0	93.0	96.0	1.6	4 to 16	1.5 to 25	4 to 16	1.5 to 25
Primary 460 V ± 20 V - Secondary 24 V																							
442 41	40	69	63	58	55	52	50	49	49	58	3.9	7.5	8.1	10.0	8.8	61.6	76.3	84.3	9.7	1 to 4	1 to 4	1 to 4	1 to 4
442 42	63	120	110	98	90	85	81	78	78	89	6.0	11.7	7.0	9.0	8.6	61.8	76.4	84.4	8.8	1 to 4	1 to 4	1 to 4	1 to 4
442 43	100	210	180	170	150	140	140	130	130	150	8.2	17.8	7.1	9.2	9.2	62.7	77.1	84.9	8.9	1 to 4	1 to 4	1 to 4	1 to 4
442 44	160	390	340	300	270	250	230	220	220	230	11.2	24.8	5.3	7.2	7.8	65.9	79.4	86.6	7.0	1 to 4	1 to 4	1 to 4	1 to 4
442 45	250	540	490	450	420	400	380	370	370	440	14.9	31.2	5.2	6.6	6.0	70.6	82.8	88.9	6.0	1 to 4	1 to 4	1 to 4	1 to 4
442 46	400	1900	1400	1200	980	800	800	700	600	600	18.3	45.4	2.1	3.6	5.4	72.6	84.1	89.8	4.1	1 to 4	1 to 4	1 to 4	1 to 4
442 47	630	2200	1700	1400	1000	1000	900	800	800	700	25.5	80.9	2.3	4.0	4.7	70.0	82.4	88.6	3.8	1 to 4	1 to 4	1 to 10	1 to 10
442 48	1000	3400	2800	2300	2000	1800	1600	1500	1400	1300	44.2	73.6	1.3	2.1	2.8	80.3	89.1	93.1	2.3	1 to 16	1 to 16	1 to 16	1 to 16
442 49	1600	14300	12000	10300	9100	8200	7500	7000	6600	6800	65.5	93.7	1.0	1.5	1.9	83.7	91.1	94.5	1.6	2.5 to 10	1.5 to 16	4 to 16	1.5 to 25
442 50	2500	4300	3900	3600	3300	3100	3000	2900	2900	3400	86.5	141.0	1.8	2.2	2.0	84.2	91.4	94.7	1.9	4 to 16	1.5 to 25	4 to 35	2.5 to 50
Primary 460 V ± 20 V - Secondary 115-230 V																							
442 81	40	67	61	57	53	51	49	48	49	58	3.9	7.4	8.2	10.0	8.7	61.8	76.4	84.4	9.7	1 to 4	1 to 4	1 to 4	1 to 4
442 82	63	120	110	99	92	86	82	79	78	90	6.0	11.8	7.0	9.1	8.8	61.7	76.3	84.3	8.9	1 to 4	1 to 4	1 to 4	1 to 4
442 83	100	190	180	160	150	140	140	130	130	150	8.2	17.2	7.3	9.3	8.6	63.6	77.7	85.3	8.7	1 to 4	1 to 4	1 to 4	1 to 4
442 84	160	330	300	270	250	240	230	220	220	260	11.2	23.2	5.9	7.4	6.9	67.4	80.5	87.3	6.9	1 to 4	1 to 4	1 to 4	1 to 4
442 85	250	590	530	480	450	420	400	390	390	440	15.0	31.2	5.0	6.4	6.1	70.6	82.8	88.9	5.9	1 to 4	1 to 4	1 to 4	1 to 4
442 86	400	2500	1900	1600	1300	1100	1020	920	840	810	18.3	42.4	2.0	3.3	4.8	73.9	85.0	90.4	3.8	1 to 4	1 to 4	1 to 4	1 to 4
442 87	630	2300	1800	1500	1300	1100	1000	900	800	800	25.5	75.7	2.1	3.5	4.6	71.4	83.3	89.3	3.4	1 to 4	1 to 4	1 to 4	1 to 4
442 88	1000	3400	2800	2300	2000	1800	1600	1500	1400	1300	44.2	72.4	1.2	1.9	2.7	80.6	89.2	93.3	2.2	1 to 16	1 to 16	1 to 16	1 to 16
442 89	1600	10300	8700	7600	6700	6100	5600	5200	5000	5100	65.5	92.4	1.0	1.4	1.7	83.9	91.2	94.5	1.4	2.5 to 10	1.5 to 16	2.5 to 10	1.5 to 16
442 90	2500	10700	9000	7800	6900	6200	5700	5300	5100	5200	86.5	140.8	1.2	1.7	2.1	84.2	91.4	94.7	1.7	4 to 16	1.5 to 25	4 to 16	1.5 to 25
442 91	4000	20300	16900	14500	12800	11500	10500	9800	9200	9400	86.3	224.8	1.8	2.7	3.3	84.2	91.4	94.7	2.6	4 to 16	1.5 to 25	4 to 16	1.5 to 25

(1) Total losses at nominal voltage

■ Characteristics

Insulation voltage:
- between windings: 4 470 V
- between primary and earth: 2 240 V
- between secondary and earth: 250 V for 12 and 24 V and 1 780 V for 48, 115 and 230 V

Fig. 1

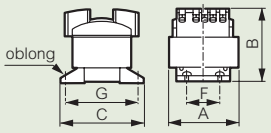


Fig. 2

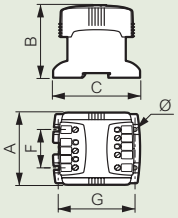


Fig. 3

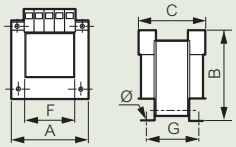
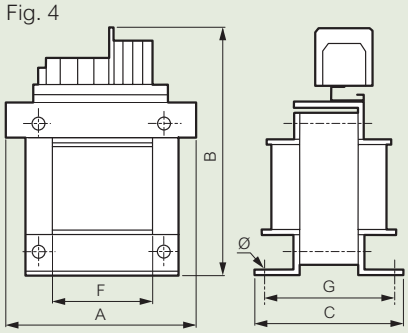


Fig. 4



Cat.Nos	Power (VA)	AIO (VA) cos φ 0.5	Fig.	Dimensions (mm)			Fixing (mm)			Weight (kg)	No load loss (W)	Total losses at 100% load (W)	Voltage drop (%)		Efficiency (%)		Ucc (%)	Connection PRI cable (mm²)		lug Ø	Connection SEC cable (mm²)		lug
				A	B	C	F	G	Ø				cos φ 1	cos φ 0.45	cos φ 1	cos φ 0.45		flexible	rigid	(mm)	flexible	rigid	Ø (mm)
Single-phase safety transformers: Primary 230-400 V - Sec 12-24 V																							
428 40	40	55	1	84	70	98	40	86	4.5	0.9	3.7	13.1	18.3	12.7	0.75	0.58	15.6	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 41	63	91	1	84	77	98	40	86	4.5	1.3	4.9	16.3	13.5	10.2	0.79	0.64	11.8	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 42	100	140	1	84	86	98	40	86	4.5	1.6	6.2	21.0	10.5	8.7	0.83	0.68	9.5	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 43	160	205	1	84	104	98	40	86	4.5	2.4	9.1	31.8	8.8	7.4	0.83	0.69	7.9	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 44	220	290	1	96	115	110	40	98	4.5	3.4	12.6	40.0	6.9	6.3	0.85	0.71	6.5	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 45	310	345	2	106	123	115	50	100	5.2	3.82	14.2	54.9	7.3	6.2	0.85	0.72	8.2	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 46	450	1100	3	126	126	126	90	94	6.5	6	21.8	63.9	6.0	3.2	0.88	0.76	4.9	1 to 4	1 to 4	4.5	1 to 16	1 to 25	6.5
428 47	630	1520	3	126	126	141	90	105	6.5	8	25.5	62.4	4.3	2.6	0.91	0.82	3.5	1 to 4	1 to 4	4.5	1 to 16	1 to 25	6.5
428 49	1000	4130	4	220	222	170	122	140	7	14.7	43.3	76.2	2.9	1.8	0.93	0.86	2.4	0.25 to 6	0.5 to 10	-	4 to 35	2.5 to 50	-
Single-phase safety or isolation transformers: Primary 230-400 V - Sec 24-48 V																							
428 70	40	55	1	84	70	98	40	86	4.5	0.9	3.7	12.9	18.0	12.5	0.76	0.58	15.4	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 71	63	91	1	84	77	98	40	86	4.5	1.3	4.9	16.5	13.7	10.3	0.79	0.63	11.9	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 72	100	140	1	84	86	98	40	86	4.5	1.6	6.2	21.0	10.4	8.7	0.83	0.68	9.4	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 73	160	205	1	84	104	98	40	86	4.5	2.4	9.1	31.6	8.7	7.3	0.84	0.70	7.8	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 74	220	290	1	96	115	110	40	98	4.5	3.4	12.6	39.5	6.7	6.2	0.85	0.71	6.3	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
428 75	310	345	2	106	123	115	50	100	5.2	3.82	14.2	54.9	7.3	6.2	0.85	0.72	8.2	1 to 4	1 to 4	4.5	1 to 4	1 to 4	6.5
428 76	450	708	2	120	140	140	62.5	125	5.2	5.62	18.4	66.0	6.2	5.4	0.87	0.75	4.6	1 to 4	1 to 4	4.5	1 to 4	1 to 4	6.5
428 77	630	1 520	3	126	126	141	90	105	6.5	8	25.5	64.3	4.2	2.6	0.91	0.82	3.5	1 to 4	1 to 4	4.5	1 to 16	1 to 25	6.5
Single-phase circuits isolation transformers: Primary 230-400 V - Sec 115-230 V																							
427 85	40	55	1	84	70	98	40	86	4.5	1	3.7	10.9	15.6	12.6	0.79	0.62	14.2	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 86	63	91	1	84	77	98	40	86	4.5	1.3	4.9	15.6	12.5	9.7	0.80	0.65	11.0	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 87	100	140	1	84	86	98	40	86	4.5	1.6	6.2	21.1	10.7	8.9	0.83	0.68	9.7	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 88	160	205	1	84	104	98	40	86	4.5	2.4	9.1	32.3	8.8	7.3	0.83	0.69	7.9	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 89	220	290	1	96	115	110	40	98	4.5	3.4	12.6	40.1	6.8	6.2	0.85	0.71	6.4	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 90	310	345	2	106	123	115	50	100	5.2	3.82	14.2	54.0	7.3	6.2	0.85	0.72	6.7	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 91	450	708	2	120	140	140	62.5	125	5.2	5.62	18.4	64.0	5.9	5.1	0.88	0.76	4.3	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5
427 92	630	1520	3	126	126	123	90	105	6.5	7.8	25.5	64.6	4.3	2.6	0.91	0.81	4.2	1 to 4	1 to 4	4.5	1 to 4	1 to 4	4.5

■ Which transformer for which circuit ?

Each circuit needs a specific transformer output: transformer sizing
But, to size an equipment transformer it is not enough to add up the powers of the operating circuits, the permissible instantaneous power must be considered (inrush power)

■ How to calculate a transformer's power and size?

For equipment including automatic devices, transformer's power depends on:
- The max. power needed at a given moment (inrush power)
- Constant power absorbed by the circuit
- Voltage drop
- Power factor

1) Determining the inrush power

To determine the inrush power, we make the following assumptions:
- Two inrushes cannot occur at the same time
- Power factor cos φ 0.5 at closing
- Max. 80 % of devices power supplied at the same time

Empirically and to simplify, this power can be calculated using the following formula:

P inrush = 0.8 (Σ Pm + Σ Pv + Pa)

Σ Pm: sum of all contactors holding powers
Σ Pv: sum of all indicators light powers
Pa: inrush power of the largest contactor

Example :

A machine tool control cabinet contains :
- 10 contactors for 4-kW motors, holding power 8 VA
- 4 contactors for 18.5-kW motor, holding power 20 VA
- 1 contactor for 45-kW motor, holding power 20 VA, inrush power 250 VA cos φ 0.5
- 25 remote control relays, holding power 4 VA
- 45 signalling lights, consumption 1 VA

Σ Pm = 10 x 8 VA = 80 VA
4 x 20 VA = 80 VA
1 x 20 VA = 20 VA
25 x 4 VA = 100 VA
280 VA

Σ Pv = 45 x 1 VA = 45 VA
Pa = 250 VA

P inrush = 0.8 (280 + 45 + 250) = 460 VA at cos φ 0.5

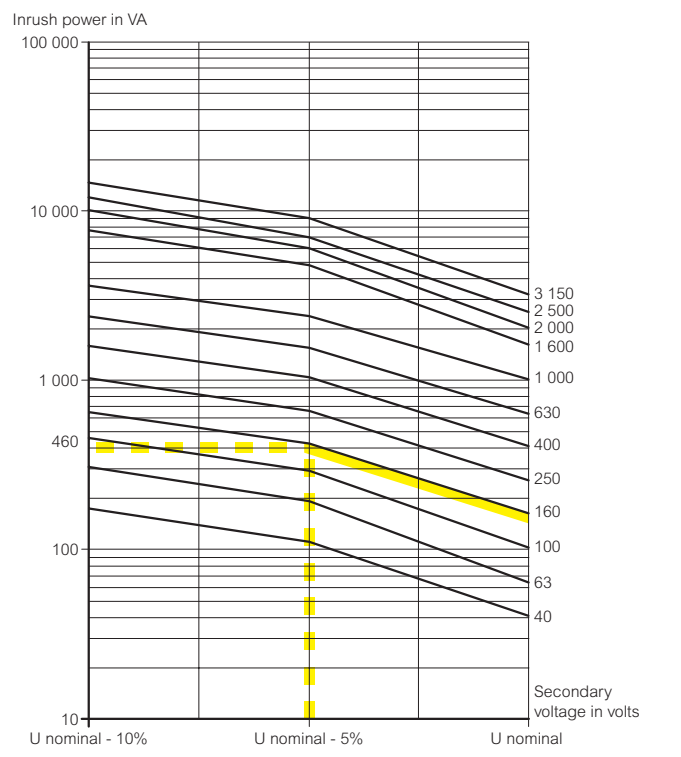
2) Determining the transformer's size

Especially for control transformers, just read the size below from the inrush power at cos φ 0.5:

Nominal power VA IEC and CSA	Permissible instantaneous power VA IEC/EN 61558-2-2 with cos φ of :								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
40	90	80	72	66	61	57	53	51	53
63	160	140	130	120	110	100	90	90	90
100	210	190	170	160	150	140	130	130	140
160	480	400	350	300	270	240	220	200	190
250	830	690	590	510	450	400	360	330	310
400	1600	1400	1200	1000	900	800	800	700	700
630	2000	1800	1500	1400	1200	1100	1100	1000	1000
1000	5400	4600	4000	3600	3200	3000	2700	2600	2500
1600	9000	8000	7200	6600	6100	5700	5400	5300	5600
2500	7300	6600	6000	5700	5200	4900	4700	4600	5100
4000	34500	28800	24400	17000	16600	16400	14800	13400	12400
5000	29000	23000	20000	17000	16000	14000	13000	12000	12000
6300	20000	18000	17000	16000	15000	15000	15000	15000	18000
8000	45000	39000	35000	32000	30000	28000	27000	26000	29000

Inrush power of 460 VA at cos φ 0.5 entails minimum size of 250 VA

Voltage drop sizing curves at cos φ 0.5



For power of 460 VA cos φ 0.5, the curve at U nominal - 5 %* indicates a value of 160 VA
* Value deliberately selected as a precaution

3) Checking the choice

Make a check according to each piece of equipment :
- calculate the total sum of the holding powers of the windings and of the live indicator lights
- then apply a factor: either that of 80 % of devices held live at the same time, or that from the actual calculations for your equipment

The sizing power must be equal to or more than the result of this calculation

Rule for determining the secondary protection rating :

To check that the device chosen is suitable, an approximate minimum short-circuit value at the furthest point of the installation can be obtained using the following formula:

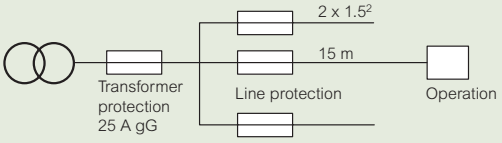
$$I\ c/c\ mini = \frac{Us}{\left(\frac{U^2 s}{P} \times \frac{U\ c/c\ \%}{100}\right) + \frac{2\rho l}{S}}$$

Us = transformer secondary voltage
P = transformer power
U c/c % = transformer short-circuit voltage
l = line length in m
S = line cross-section in mm²
ρ copper = 0.027 Ω mm²/m

Choose the protection rating so as to obtain a cut-off time of 5" max. for the current I c/c defined above :

gG fuse : $In \leq \frac{I\ c/c\ min.}{4}$ type C MCB: $In \leq \frac{I\ c/c\ min.}{8}$

Example : control transformer 630 VA - 230/24 V Cat.No 442 17



$$I\ c/c\ min. = \frac{24}{\left(\frac{24^2}{630} \times \frac{3.7}{100}\right) + \frac{2 \times 0.027 \times 15}{1.5}} = 41.82\ A$$

$\frac{41.82}{4} = 10.45 \rightarrow$ gG 10 A max. $\frac{41.82}{8} = 5.22 \rightarrow$ DX 5 A max. C.curve

■ Protection of lines

General

Lines must be protected against overloads and short-circuits. Protection against overloads is only compulsory if the line is likely to be affected by an overload current. This protection can be installed at the head or end of the line. Protection against short-circuits is compulsory in all installations ; this protection has to be installed at the head of the line

Supply line (transformer primary)

The transformer is a devicethat cannot generate overloads. Its supply line requires protection against short-circuits only. When a transformer is energised. a very high inrush current is produced (in the region of 25 In) for approximately 10 ms. The line protection must take these 2 factors into consideration. Legrand offers 3 possibilities: aM fuse cartridges, type D MCBs (average value of the magnetic 12 In, with a standard adjustment range between 10 and 14 In), type C MCBs (average value of the magnetic 7 In, with a standard adjustment range between 5 and 10 In)

Minimal protection rating for primary supply line on transformer(1)

Power	230 V single - phase				400 V single - phase			230 V three - phase			400 V three - phase		
	aM Cartridge	MCBs C curve or MCCBs	MCBs D curve or MCCBs	type B MCB with inrush current limiter	aM Cartridge	MCBs C curve or MCCBs	MCBs D curve or MCCBs	aM Cartridge	MCBs C curve or MCCBs	MCBs D curve or MCCBs	aM Cartridge	MCBs C curve or MCCBs	MCBs D curve or MCCBs
40 VA	0.5 A 130 95	1 A 064 60		1 A 067 52	0.25 A 130 92	1 A 064 60			1 A 064 80			1 A 064 80	
63 VA	1 A 130 01	2 A 064 61		1 A 067 52	0.5 A 130 95	1 A 064 60			1 A 064 80			1 A 064 80	
100 VA	1 A 130 01	3 A 064 62	1 A 066 25	1 A 067 52	1 A 130 01	2 A 064 61	1 A 066 25		2 A 064 81			1 A 064 80	
160 VA	2 A 130 02	6 A 064 64	2 A 066 26	1 A 067 52	1 A 130 01	2 A 064 61	1 A 066 25		2 A 064 81			2 A 064 81	
220 VA	2 A 130 02	6 A 064 64	2 A 066 26	2 A 067 53	1 A 130 01	3 A 064 62	2 A 066 26		3 A 064 82			2 A 064 81	
250 VA	2 A 130 02	6 A 064 64	3 A 066 27	2 A 067 53	2 A 130 02	3 A 064 62	2 A 066 26		3 A 064 82			2 A 064 81	
310 VA	4 A 130 04	10 A 064 66	3 A 066 27	2 A 067 53	2 A 130 02	6 A 064 64	2 A 066 26		6 A 064 84			3 A 064 82	
400 VA	4 A 130 04	10 A 064 66	6 A 066 29	2 A 067 53	2 A 130 02	6 A 064 64	2 A 066 26	2 A 130 02	6 A 064 84	3 A 066 47	2 A 130 02	3 A 064 82	2 A 066 46
450 VA	4 A 130 04	10 A 064 66	6 A 066 29	3 A 067 54	2 A 130 02	6 A 064 64	3 A 066 27	2 A 130 02	6 A 064 84	3 A 066 47	2 A 130 02	6 A 064 84	2 A 066 46
630 VA	6 A 130 06	16 A 064 68	6 A 066 29	3 A 067 54	4 A 130 04	10 A 064 66	6 A 066 29	4 A 130 04	10 A 064 86	6 A 066 49	2 A 130 02	6 A 064 84	2 A 066 46
800 VA	6 A 130 06	16 A 064 68	10 A 066 31	6 A 067 56	4 A 130 04	10 A 064 66	6 A 066 29	4 A 130 04	10 A 064 86	6 A 066 49	2 A 130 02	6 A 064 84	3 A 066 47
1000 VA	10 A 130 10	20 A 064 69	10 A 066 31	6 A 067 56	4 A 130 04	16 A 064 68	6 A 066 29	4 A 130 04	16 A 064 88	6 A 066 49	4 A 130 04	10 A 064 86	3 A 066 47
1250 VA	10 A 130 10	25 A 064 70	16 A 066 33	6 A 067 56	6 A 130 06	16 A 064 68	10 A 066 31	6 A 130 06	16 A 064 88	10 A 066 51	4 A 130 04	10 A 064 86	6 A 066 49
1600 VA	10 A 130 10	32 A 064 71	16 A 066 33	10 A 067 58	6 A 130 06	20 A 064 69	10 A 066 31	6 A 130 06	20 A 064 89	10 A 066 51	4 A 130 04	16 A 064 88	6 A 066 49
2000 VA	12 A 130 12	40 A 064 72	20 A 066 34	10 A 067 58	8 A 130 08	25 A 064 70	16 A 066 33	10 A 130 10	25 A 064 90	16 A 066 53	6 A 130 06	16 A 064 88	6 A 066 49
2500 VA	16 A 130 16	50 A 064 73	25 A 066 35	16 A 067 60	10 A 130 10	32 A 064 71	16 A 066 33	10 A 130 10	32 A 064 91	16 A 066 53	6 A 130 06	20 A 064 89	10 A 066 51
4 kVA	25 A 130 25	80 A 064 75	32 A 066 36	20 A 067 61	16 A 130 16	40 A 064 72	20 A 066 34	16 A 130 16	50 A 064 93	25 A 066 55	10 A 130 10	32 A 064 91	16 A 066 53
5 kVA	32 A 140 32	80 A 064 75	40 A 066 37	25 A 067 62	16 A 130 16	50 A 064 73	25 A 066 35	20 A 130 20	63 A 064 94	32 A 066 56	12 A 130 12	40 A 064 92	16 A 066 53
6.3 kVA	32 A 140 32	100 A 064 76	50 A 066 38	32 A 067 63	20 A 130 20	63 A 064 74	32 A 066 36	25 A 130 25	80 A 064 95	40 A 066 57	16 A 130 16	50 A 064 93	20 A 066 54
8 kVA	40 A 140 40	160 A 251 25	63 A 066 39	40 A 067 64	25 A 130 25	80 A 064 75	40 A 066 37	32 A 140 32	100 A 064 96	50 A 066 58	20 A 130 20	63 A 064 94	25 A 066 55
10 kVA	63 A 150 63	160 A 251 25	80 A 066 40		32 A 140 32	100 A 064 76	50 A 066 38	32 A 140 32	100 A 064 96	50 A 066 58	20 A 130 20	63 A 064 94	32 A 066 56
12.5 kVA	63 A 150 63	160 A 251 25	100 A 066 41		40 A 140 40	160 A 251 25	63 A 066 39	40 A 140 40	125 A 064 97	63 A 066 59	25 A 130 25	80 A 064 95	32 A 066 56
16 kVA	80 A 150 80	160 A 251 25	125 A 066 42		50 A 140 50	160 A 251 25	80 A 066 40	50 A 140 50	160 A 251 25	80 A 066 60	32 A 140 32	100 A 064 96	40 A 066 57
20 kVA	100 A 150 96	160 A 251 25	160 A 251 25		63 A 150 63	160 A 251 25	100 A 066 41	63 A 150 63	160 A 251 25	100 A 066 61	40 A 140 40	125 A 064 97	50 A 066 58
25 kVA	125 A 150 97	250 A 252 06	250 A 252 06		80 A 150 80	160 A 251 25	125 A 066 42	80 A 150 80	160 A 251 25	125 A 066 62	50 A 140 50	160 A 251 25	63 A 066 59
31.5 kVA	160 A 165 55	250 A 252 06	250 A 252 06		100 A 150 96	160 A 251 25	160 A 251 25	100 A 150 96	160 A 251 25	160 A 251 25	63 A 150 63	160 A 251 25	80 A 066 60
40 kVA	200 A 170 60	320 A 255 22	320 A 255 22		125 A 150 97	250 A 252 06	250 A 252 06	125 A 150 97	250 A 252 06	250 A 252 06	63 A 150 63	160 A 251 25	100 A 066 61
50 kVA	315 A 175 70	400 A 255 23	400 A 255 23		160 A 165 55	250 A 252 06	250 A 252 06	160 A 165 55	250 A 252 06	250 A 252 06	80 A 150 80	160 A 251 25	125 A 066 62
63 kVA	315 A 175 70	500 A 255 25	500 A 255 25		200 A 170 60	320 A 255 22	320 A 255 22	200 A 170 60	250 A 252 06	250 A 252 06	100 A 150 96	160 A 251 25	160 A 251 25
80 kVA								250 A 170 65	250 A 252 06	250 A 252 06	160 A 165 55	160 A(2) 252 06	160 A(2) 252 06
100 kVA								315 A 175 70	320 A 255 22	320 A 255 22	160 A 165 55	160 A(2) 252 06	160 A(2) 252 06
125 kVA								400 A 175 75	400 A 255 23	400 A 255 23	200 A 170 60	200 A(2) 252 06	200 A(2) 252 06
160 kVA								500 A 180 25	500 A 255 25	500 A 255 25	250 A 170 65	250 A 252 06	250 A 252 06
200 kVA								630 A 180 30	630 A 255 24	630 A 255 24	315 A 175 70	320 A 255 22	320 A 255 22
250 kVA								630 A 180 30	630 A 255 24	630 A 255 24	400 A 175 75	400 A 255 23	400 A 255 23

Operating line (transformer secondary)

This line must be protected against overloads (ensure that the protection rating chosen is ≤ transformer secondary current) and short-circuits (ensure that a short-circuit occurring at the furthest point of the line will trigger the protective device within 5 seconds. Legrand offers two possibilities: gG cartridge fuses, type C MCBs (magnetic set to 7 In average). If the transformer only supplies a single operating line, and provided the calculations show perfect compatibility, transformer protection (if on the secondary) and line protection can be one and the same A single protective device performs both functions (see table of transformer protective devices). If the transformer supplies several operating lines, overload and short-circuit calculations must be performed for each individual line

(1) These values are given for information only for transformers with inrush currents of around 25 In.
(2) Thermal adjustment

■ Protection of transformers

According to IEC/EN 61558 standards, transformers must be protected against overloads and short-circuits which may occur during normal operations

The standards do not specify the location or type of protective device: it is the manufacturer's responsibility to select the most suitable position, either on the primary or secondary side
Legrand has selected secondary protection. The rating, type and location of the protective device are indicated on the front of its devices

Single-phase: Control, safety isolating, isolating, equipment and installation transformers

Nominal power IEC and CSA	12 V				24 V				48 V				115 V				230 V			
	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos
40 VA	4	T4 AL(1)	4	T4 AL(1)	2	T2 AL(1)	2	T2 AL(1)	1	T1 AL(1)	1	T1 AL(1)	0.4	T0.4 AL(1)	0.4	T0.4 AL(1)	0.2	T0.2 AL(1)	0.2	T0.2 AL(1)
63 VA	5	T5 AL(1)	5	T5 AL(1)	2.5	T2.5 AL(1)	2.5	T2.5 AL(1)	1.25	T1.25 AL(1)	1.25	T1.25 AL(1)	0.5	T0.5 AL(1)	0.5	T0.5 AL(1)	0.25	T0.25 AL(1)	0.25	T0.25 AL(1)
100 VA	8	T8 AE(1)	8	063 93	4	T4 AE(1)	4	063 91	2	T2 AL(1)	2	063 89	0.8	T0.8 AL(1)	1	063 88	0.4	T0.4 AL(1)	0.5	063 86
160 VA	16	133 16	13	063 95	8	133 08	6	063 92	3.15	T3.15 AE(1)	4	063 91	1.6	T1.6 AL(1)	2	063 89	0.63	T0.63 AL(1)	1	063 88
220 VA	20	133 20	20	063 97	10	133 10	10	063 94	5	T5 AE(1)	6	063 92	2	T2 AL(1)	2	063 89	1	T1 AL(1)	1	063 88
250 VA	20	133 20	20	063 97	10	133 10	10	063 94	6	133 06	6	063 92	2	T2 AL(1)	2	063 89	1	T1 AL(1)	1	063 88
310 VA	25	133 25	25	063 98	12	133 12	13	063 95	6	133 06	6	063 92	2.5	T2.5 AE(1)	3	063 90	1.25	T1.25 AL(1)	2	063 89
400 VA	32	143 32	32	063 99	16	133 16	16	063 96	8	133 08	8	063 93	4	133 04	4	063 91	2	133 02	2	063 89
450 VA	40	143 40	40	064 00	20	133 20	20	063 97	10	133 10	10	063 94	4	133 04	4	064 91	2	133 02	2	063 89
630 VA	50	143 50	50	063 81	25	133 25	25	063 98	12	133 12	13	063 95	6	133 06	6	063 92	4	133 04	3	063 90
800 VA	63	153 63	63	063 82	32	143 32	32	063 99	16	133 16	16	063 96	8	133 08	8	063 93	4	133 04	4	063 91
1000 VA	80	153 80	80	063 83	40	143 40	40	064 00	20	133 20	20	063 97	8	133 08	8	063 93	4	133 04	4	063 91
1250 VA	100	153 96	100	064 76	50	143 50	50	063 81	25	133 25	25	063 98	10	133 10	10	064 94	6	133 06	6	063 92
1600 VA	125	153 97	125	064 77	63	153 63	63	063 82	32	143 32	32	063 99	16	133 16	13	064 95	8	133 08	8	063 93
2000 VA			160		80	153 80	80	063 83	40	143 40	40	064 00	16	133 16	16	063 96	8	133 08	8	063 93
2500 VA			200		100	153 96	100	064 76	50	143 50	50	063 81	20	133 20	20	063 97	10	133 10	10	063 94
4 kVA									80	153 80	80	063 83	32	143 32	32	063 99	16	133 16	16	063 96
5 kVA									100	153 96	100	064 76	40	143 40	40	064 00	20	133 20	20	063 97
6.3 kVA									125	153 97	125	064 77	50	143 50	63	063 82	25	133 25	32	063 99
8 kVA													80	153 80	80	063 83	32	143 32	32	063 99
10 kVA													80	153 80	80	063 83	40	143 40	40	064 00
12.5 kVA													100	153 96	100	064 76	50	143 50	50	063 81
16 kVA													160	163 55	160	251 25	80	153 80	80	063 83
20 kVA													160	163 55	250	252 06	80	153 80	80	063 83
25 kVA													200	168 60	250	252 06	100	153 96	100	064 76
31.5 kVA													250	173 65	250	252 06	125	153 97	125	064 77
40 kVA													400	178 75	320	255 22	160	163 55	250	252 06
50 kVA													400	178 75	400	255 23	200	168 60	250	252 06
63 kVA													500	181 25	500	255 35	250	173 65	250	252 06

(1) Fuses IEC 127 (cartridge 5 x 20 T type)

Three - phase: Control. safety isolating. isolating. equipment and installation transformers

Nominal power	24 V				42 V				230 V				400 V			
	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos	Rating	Cartridge Cat.Nos	Rating	MCBS Cat.Nos
400 VA	10	133 10	10	065 61	6	133 06	6	065 59	1	133 01	1	069 92	1	133 01	1	069 92
630 VA	16	133 16	16	065 63	10	133 10	10	065 61	2	133 02	2	065 56	1	133 01	1	069 92
1000 VA	25	133 25	25	065 65	16	133 16	16	065 63	4	133 04	3	069 94	2	133 02	2	065 56
1600 VA	40	143 40	40	065 67	25	133 25	20	065 64	4	133 04	6	065 59	4	133 04	3	069 94
2500 VA	63	153 63	63	065 69	40	143 40	32	065 66	6	133 06	6	065 59	4	133 04	6	065 59
4 kVA	100	153 96	100	065 71	63	153 63	50	065 68	10	133 10	10	065 61	6	133 06	6	065 59
6.3 kVA	160	163 55	160		100	153 96	80	065 70	16	133 16	16	065 63	10	133 10	10	065 61
10 kVA	250	173 65	250		160	163 55	125	065 72	25	133 25	25	065 65	16	133 16	16	065 63
16 kVA									40	143 40	40	065 67	25	133 25	25	065 65
25 kVA									63	153 63	63	065 69	40	143 40	40	065 67
40 kVA									100	153 96	100	065 71	63	153 63	63	065 69
50 kVA									125	153 97	125	065 72	80	153 80	80	065 70
63 kVA									160	163 55	160	251 33	100	153 96	100	065 71
80 kVA									200	168 60	250	252 16	125	153 97	125	065 72
100 kVA									250	173 65	250	252 16	160	163 55	160	251 33
125 kVA									315	178 70	400	255 38	200	168 60	250	252 16
160 kVA									400	178 75	400	255 38	250	173 65	250	252 16
200 kVA									500	181 25	630	255 40	315	178 70	400	255 38
250 kVA									630	181 30	630	255 40	400	178 75	400	255 38

■ Main transformer functions:

- **Changing voltage:**



Isolation transformer
(basic insulation between primary and secondary)



Auto-transformer
(no insulation between primary and secondary)

- **Control circuit power supply**



Control transformer
(basic insulation between primary and secondary)

- **Protection against electric shock**

- Protection against direct and indirect contact by:



Safety isolating transformers
(reinforced insulation between primary and secondary, no-load voltage < 50 V)

- Protection against indirect contact by:



Isolating transformers
(reinforced insulation between primary and secondary)



Isolating transformers
For the supply of medical location (group II)

The transformer function(s) can either be defined by the equipment designer or can be imposed by installation guidelines or the equipment standard

Definitions:
- Electric shocks: physiological effect resulting from an electrical current through a human or animal body (IEV 195-01-04)
- Direct contact: electric contact of persons or animals with live parts (195-06-03)
- Indirect contact: electric contact of persons or animals with exposed-conductive-parts which have become live under fault conditions (195-06-04)

filtered rectified power supplies
single-phase



470 23



470 24

Power supplies for PLCS and peripheral equipment, and all other uses which need 24 V DC
Supplied with an insulated coupling bar for fast connection between the – and T terminals up to 15 A
Clip-on only up to 24 W, clip-on or screw fixing up to 120 W
Above 120 W: screw fixing
Conform to standards IEC and EN 61558-2-6, UL 60950 and CAN/CSA-C22.2 No 60 950.00
UL USA and Canada agreements
Products suitable for building equipment conforming to standards EN 61131-2, EN 60204 and EN 60439-1

Single-phase power supplies

Consisting of:
- a safety transformer with interference filtering
- double operating terminals
- filter capacitors
- fused protection in the secondary
- a green operating voltage present indicator

24 V⎓

230-400 V ± 15 V∿ (primary) / 24 V⎓(secondary)

Pack	Cat.Nos	Output (W)	Current (A)	Terminal capacity Flexible cables Input	Terminal capacity Flexible cables Output
1	470 21	24	1	6	6
1	470 22	60	2.5	6	6
1	470 23	120	5	6	6
1	470 24	240	10	6	6
1	470 25	360	15	6	6
1	470 26	600	25	6	10
1	470 28	960	40	6	16
1	470 29	1200	50	16	16

Lexic single-phase power supplies (p. 182)

filtered rectified power supplies
single-phase

■ Dimensions

Fig. 1

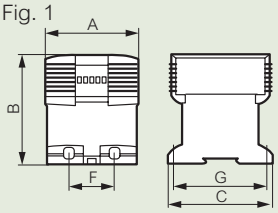
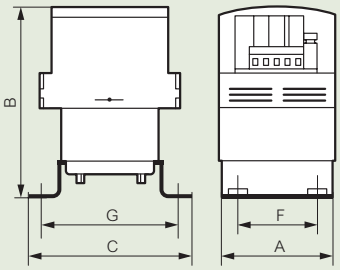


Fig. 2



Cat.Nos	Out voltage (V)	Out current (A)	Fig.	Dimensions (mm) A	B	C	Fixing (mm) F	G	Ø	Weight (kg)
470 21	24	1	1	68	98	88	-	-	-	1
470 22	24	2.5	1	93	121	105	45	94	4.6	2.45
470 23	24	5	1	105	135	115	45	104	4.6	3.6
470 24	24	10	2	126	186	175	75	150	5.5	6.35
470 25	24	15	2	126	206	175	75	150	5.5	7.6
470 26	24	25	3	180	238	290	150	105	9	18.1
470 28	24	40	4	310	265	478	445	200	7	50
470 29	24	50	4	335	315	575	542	200	7	60

Cat.Nos	Primary on-load (A) current at 230 V	Primary on-load (A) current at 400 V	Operating voltages Ope n circuit (V)	On-load (V)	On-load 100 mA and primary voltage + 10 %	Nominal on-load and primary voltage - 15 %	No-load losses (W)	Total losses at 100 % load (W)	Voltage drop %
470 21	0.18	0.10	29.0	22.8	31.2	20.2	4.4	10.3	27.03
470 22	0.47	0.27	27.8	23.3	30.4	20.4	8.3	16.3	19.46
470 23	0.88	0.51	27.5	23.2	30.2	20.3	11.4	25.4	18.68
470 24	1.88	1.09	27.7	23.5	30.5	20.5	20	45.3	18.20
470 25	2.53	1.46	27.5	23.2	30.2	20.2	23	54.7	18.70
470 26	4.70	2.70	28.3	24	31.1	20.9	41.3	76.8	17.92
470 28	6.20	3.60	28.4	23.2	31.2	20.4	230	340	22.41
470 29	7.20	4.10	25.4	23.5	27.9	20.2	194	340	8.09

Legrand System

These products are part of industrial equipment > See p. 266-267

Red catalogue numbers: New products

isolating transformers for hospitals
protected

NEW



425 71



425 81

Conform to standard IEC EN 61558-2-15
IP 21
The main requirements of this standard, as opposed to IEC 61558-2-4, concern:
- The secondary/earth leakage current, which is limited to 0.5 mA off-load
- The inrush current, which is limited to 12 times the peak value of the primary current
- The short-circuit voltage, which is limited to 3% of the primary voltage
Equipped with a temperature monitoring system (bi-metal strips), and outputs on dedicated terminals, for connection to a control system (optical, acoustic, etc.)

Single-phase

Primary: 230 V
Secondary: 230 V with centre tap

Pack	Cat.Nos	Output (kVA)	Terminal primary flexible cable (mm²)	Terminal secondary flexible cable (mm²)
1	425 71	2.5	16	16
1	425 72	4	16	16
1	425 73	5	35	35
1	425 74	6.3	35	35
1	425 75	8	35	35
1	425 76	10	35	35

3-phase

Primary: 400 V ⅄ + N
Secondary: 230 V ⅄ + N

Pack	Cat.Nos	Output (kVA)	Terminal primary flexible cable (mm²)	Terminal secondary flexible cable (mm²)
1	425 81	4	10	10
1	425 83	6.3	10	16
1	425 84	8	16	35
1	425 85	10	16	35

IEC EN 61558-2-15 transformer with 400 V single-phase primary (available on request)

Protection equipment for IEC EN 61558-2-15 power supply lines (please consult the technical data sheets in the e-catalogue)

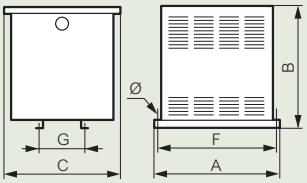
Legrand System
These products are part of industrial equipment > See p. 266-267

isolating transformers for hospitals
protected

■ Characteristics

Single-phase
Insulation voltages:
• Between windings: 3550 V
• Between primary and earth: 1770 V
• Between secondary and earth: 1770 V
Class I
Insulation: class B for 2500 VA model, ambient temperature 25 °C
class H from 4 kVA upwards, ambient temperature 25 °C
IP 21 - IK 08 (in tank)

3-phase
Insulation voltages:
• Between windings: 4450 V
• Between primary and earth: 2250 V
• Between secondary and earth: 1770 V
Class I
Insulation: class H from 4 kVA upwards, ambient temperature 25 °C
IP 21 - IK 08 (in tank)
Cat.No 425 71 to 76 and 425 81 to 85



230 V/230 V with centre tap (single-phase)

Cat. Nos	No-load loss (W)	Voltage drop (%) cos φ 1	Voltage drop (%) cos φ 0.45	Terminals Prim. mm²	Terminals Sec. mm²	Efficiency cos φ 1	Efficiency cos φ 0.45	Usc (%)	Dimensions (mm) A	B	C	Fixing (mm) F	G	Ø	Weight (kg)
425 71	25.6	2.4	1.1	16	16	0.97	0.93	2.6	320	330	253	300	111	9	36
425 72	50.6	3.7	1.7	16	16	0.95	0.90	2.9	340	410	370	320	120	9	52
425 73	54.5	3.0	1.4	35	35	0.96	0.91	2.8	340	410	370	320	150	9	67
425 74	67.7	3.2	1.5	35	35	0.96	0.91	2.8	340	410	370	320	150	9	68
425 75	85.7	2.8	1.3	35	35	0.96	0.92	2.9	340	410	370	320	180	9	77
425 76	94.5	3.2	1.5	35	35	0.96	0.91	2.5	340	410	370	320	180	9	78

400 V ⅄ + N / 230 V ⅄ + N (3-phase)

Cat. Nos	No-load loss (W)	Voltage drop (%) cos φ 1	Voltage drop (%) cos φ 0.45	Terminals Prim. mm²	Terminals Sec. mm²	Efficiency cos φ 1	Efficiency cos φ 0.45	Usc (%)	Dimensions (mm) A	B	C	Fixing (mm) F	G	Ø	Weight (kg)
425 81	40.7	3.2	1.5	10	10	0.96	0.92	2.9	420	270	190	400	126	9	55
425 83	76.2	3.7	1.7	10	16	0.95	0.90	2.8	470	410	340	450	126	9	79
425 84	96.1	3.5	1.6	16	35	0.95	0.90	2.8	470	410	340	450	176	9	106
425 85	124	3.7	1.7	16	35	0.95	0.90	2.9	470	410	340	450	176	9	107

Red catalogue numbers: New products