General data

Technical specifications

Transformers	Type	**4AP**	**4AU**
• Version		3UI core	3UI core
• Performance range (with IP00)	kVA	0.16 ... 5	> 5 ... 16
• Approvals		**cULus**	
Voltage range	V	≤ 690	
• Approvals for USA, Canada	V	≤ 600	
Rated frequency	Hz	50 ... 60	
Thermal class		B	H
• Acc. to UL/CSA		Class 130	Class 180
Ambient conditions		Protection against harmful ambient conditions: Complete impregnation in polyester resin Climate-proof for installation in rooms with an external climate to DIN 50010	
Rated ambient temperature			
• At rated power	°C	40	55
• Maximum value, after power reduction depending on load characteristics, (see "Design")	°C	80	
• Minimum value	°C	– 25	
Relative atmospheric humidity			
• Mean value up to	%	80	
• Maximum value for 30 days/year	%	95	
• At 40 °C occasionally	%	100	
Safety class		I	
Degree of protection			
• Without enclosure		IP00	
• With protective enclosure (according to "Selection and Ordering Data", see Catalog LV 1)		IP23 or IP54	
• Version		IP23, IP54: sheet-steel enclosure coated with epoxy resin, color gray RAL 7032	
Installation height		Up to 1000 m above sea level (above this, power reduction is necessary)	
Protective devices			
• External		The transformers can be protected on the primary and secondary side against short-circuits and overload by means of circuit breakers. For reliable protection against short-circuits, overload and touch, the cables between the output terminals of the transformer and the load must have a negligible line impedance. For more details see DIN VDE 0100 (Erection of low-voltage systems) Part 410, Part 520 (particularly section 525) and Part 610. Assigned protective devices (see "Technical Specifications")	
Connection method		The permissible conductor cross-sections are assigned to the specified terminal types.	
• Terminal arrangement (see "Schematics")		Refer to DIN VDE 0298-4 and EN 60204 (VDE 0113-1) for the permissible conductor cross-sections for the specified current according to the installation type.	
• For terminal versions and connectable cross-sections (see "Project Planning Aids")		Other terminal sizes than standard versions on request.	
Mounting position		The permissible mounting position for each version is shown in the "Project Planning Aids".	

Further technical specifications can be found on the Internet at http://www.siemens.com/sidac.

Rated outputs at different ambient temperatures

- With electrically isolated windings
- Degree of protection IP00
- According to EN 61558, cULus

Transformers	Rated power P_n	Permissible transformer load depending on the ambient temperature t_a of							
		60 °C	55 °C	50 °C	45 °C	40 °C	35 °C	30 °C	25 °C
Type	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA
4AP transformers									
4AP17 4	0.16	0.134	0.141	0.147	0.154	0.160	0.166	0.173	0.178
4AP18 4	0.25	0.210	0.220	0.230	0.240	0.250	0.260	0.270	0.278
4AP19 4	0.4	0.336	0.352	0.368	0.384	0.400	0.416	0.432	0.444
4AP20 4	0.63	0.529	0.554	0.580	0.605	0.630	0.655	0.680	0.699
4AP21 4	1	0.840	0.880	0.920	0.960	1	1.04	1.08	1.11
4AP25 4	1.6	1.34	1.41	1.47	1.54	1.60	1.66	1.73	1.78
4AP27 4	2.5	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.78
4AP30 4	4	3.36	3.52	3.68	3.84	4	4.16	4.32	4.44
4AP30 5	5	4.20	4.40	4.60	4.80	5.50	5.20	5.40	5.55
4AU transformers									
4AU30 3	6.3	6.11	6.30	6.49	6.68	6.93	7.12	7.31	7.50
4AU36 1	8	7.76	8	8.24	8.48	8.80	9.04	9.28	9.52
4AU36 3	10	9.70	10	10.3	10.6	11	11.3	11.6	11.9
4AU39 1	12.5	12.1	12.5	12.9	13.3	13.8	14.1	14.5	14.9
4AU39 3	16	15.5	16	16.5	17	17.6	18.1	18.6	19

Operation characteristics

- According to EN 61558-2-6, EN 61558-2-4, EN 61558-2-1

Transformers	Rated power P_n 50 Hz ... 60 Hz 1000 m above seal level Degree of protection IP00	Core size	Voltage rise in no-load operation (operating temperature) u_A approx.	Voltage drop on rated load[1] u_R approx.	Short-circuit voltage[1] u_Z approx.	Degree of efficiency η approx.
Type	kVA		%	%	%	%
4AP transformers: t_a = 40 °C/B						
4AP17 4	0.16	3UI 60/30	13.3	10.1	10.1	85
4AP18 4	0.25	3UI 75/25	11.7	8.9	9	87
4AP19 4	0.4	3UI 75/40	11.8	8.5	8.5	87
4AP20 4	0.63	3UI 90/30	9.3	6.8	6.8	89
4AP21 4	1	3UI 90/50	6.4	4.8	4.8	92
4AP25 4	1.6	3UI 114/62	4.9	3.6	3.6	93
4AP27 4	2.5	3UI 132/70	4.5	3.4	3.4	94
4AP30 4	4	3UI 150/75	3.5	2.6	2.7	95
4AP30 5	5	3UI 150/75	2.8	2.1	2.2	96
4AU transformers: t_a = 55 °C/H						
4AU30 3	6.3	3UI 150/75	3.8	2.6	2.6	96
4AU36 1	8	3UI 180/75	5.1	3.6	3.6	94
4AU36 3	10	3UI 180/75	4.1	2.9	3	95
4AU39 1	12.5	3UI 210/70	4.1	2.9	3.1	95
4AU39 3	16	3UI 210/70	3.2	2.3	2.8	96

Higher ratings and other conditions on request.

Calculation of power loss P_V

$$P_V = \frac{P_n\,(100 - \eta)}{\eta}\ \text{[kW]}$$

[1] Winding reference temperature: 20 °C.

4AP, 4AU Safety, Isolating, Control and Mains Transformers

General data

Primary-side short-circuit and overload protection with motor starter protectors

Trans-formers	Rated power P_n	Motor starter protector version: Motor protection	Rated input voltage U_{1N} in V																	
Type	kVA	Type	520	500	480	460	440	420	400	380	360	300	288	277	265	254	242	230	220	208
4AP transformers																				
4AP17 4	0.16	3RV10 11-□□□10	0DA	0DA	0EA	0EA	0EA	0EA	0EA	0EA	0FA	0GA	0GA	0GA	0HA	0HA	0HA	0HA	0HA	0HA
		Set value in A	0.26	0.26	0.29	0.29	0.29	0.31	0.32	0.34	0.4	0.48	0.52	0.54	0.55	0.55	0.56	0.56	0.58	0.62
4AP18 4	0.25	3RV10 11-□□□10	0FA	0FA	0FA	0FA	0FA	0GA	0GA	0GA	0HA	0JA	0JA	0JA	0JA	0KA	0KA	0KA	0KA	0KA
		Set value in A	0.4	0.4	0.44	0.44	0.44	0.47	0.49	0.51	0.6	0.75	0.75	0.8	0.85	0.9	0.9	0.9	0.9	0.94
4AP19 4	0.4	3RV10 11-□□□10	0HA	0HA	0JA	0JA	0JA	0JA	0JA	0JA	0KA	1AA	1AA	1AA	1AA	1BA	1BA	1BA	1BA	1BA
		Set value in A	0.62	0.62	0.7	0.7	0.71	0.75	0.78	0.82	1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.5
4AP20 4	0.63	3RV10 11-□□□10	0KA	0KA	1AA	1AA	1AA	1AA	1AA	1AA	1BA	1CA	1CA	1CA	1CA	1CA	1DA	1DA	1DA	1DA
		Set value in A	0.95	0.95	1.1	1.1	1.1	1.2	1.2	1.3	1.5	1.8	1.9	2	2	2	2.2	2.2	2.2	2.3
4AP21 4	1	3RV10 11-□□□10	1BA	1BA	1CA	1CA	1CA	1CA	1CA	1CA	1DA	1EA	1EA	1EA	1EA	1EA	1EA	1EA	1FA	1FA
		Set value in A	1.5	1.5	1.7	1.8	1.8	1.8	2	2	2.3	2.8	2.9	3.1	3.2	3.2	3.2	3.2	3.5	3.5
4AP25 4	1.6	3RV10 11-□□□10	1DA	1DA	1EA	1EA	1EA	1EA	1EA	1FA	1FA	1GA	1GA	1GA	1GA	1GA	1HA	1HA	1HA	1HA
		Set value in A	2.3	2.3	2.8	2.8	2.8	2.8	3	3.5	3.5	4.5	4.5	4.9	5	5	5.5	5.5	5.5	5.6
4AP27 4	2.5	3RV10 11-□□□10	1FA	1FA	1FA	1GA	1GA	1GA	1GA	1HA	1HA	1JA	1JA	1JA	1JA	1JA	1JA	1JA	1KA	1KA
		Set value in A	3.6	3.6	4	4.5	4.5	4.5	4.5	5.8	5.8	7	7	7.5	7.5	8	8	8	9	9
4AP30 4	4	3RV10 11-□□□10	1HA	1HA	1HA	1JA	1JA	1JA	1JA	1JA	1KA	--	--	--	--	--	--	--	--	--
		3RV10 21-□□□10	--	--	--	--	--	--	--	--	--	4AA	4AA	4AA	4AA	4AA	4AA	4BA	4BA	4BA
		Set value in A	5.7	5.7	6	7	7	7	7.2	8	9	11	11	12	12	13	13	14	14	14
4AP30 5	5	3RV10 11-□□□10	1JA	1JA	1JA	1KA	1KA	1KA	--	--	--	--	--	--	--	--	--	--	--	--
		3RV10 21-□□□10	--	--	--	--	--	--	1KA	4AA	4AA	4AA	4BA	4BA	4BA	4BA	4CA	4CA	4CA	4CA
		Set value in A	7.2	7.2	8	9	9	9	9	11	11	13	14	15	15	16	17	17	17	17
4AU transformers																				
4AU30 3	6.3	3RV10 11-□□□10	1KA	1KA	1KA	1KA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		3RV10 21-□□□10	--	--	--	--	1KA	4AA	4AA	4AA	4AA	4BA	4BA	4BA	4CA	4CA	4CA	4DA	4DA	4DA
		Set value in A	9	9	10	10	10	11	11	12	13	15	16	16	17	18	19	20	20	22
4AU36 1	8	3RV10 21-□□□10	4AA	4AA	4AA	4AA	4AA	4BA	4BA	4BA	4BA	4CA	4CA	4CA	4DA	4DA	4DA	--	--	--
		3RV10 31-□□□10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4EA	4EA	4EA
		Set value in A	12	12	13	13	13	14	15	15	16	20	20	21	22	23	24	25	26	28
4AU36 3	10	3RV10 21-□□□10	4BA	4BA	4BA	4BA	4CA	4CA	4CA	4CA	4CA	4DA	4DA	--	--	--	--	--	--	--
		3RV10 31-□□□10	--	--	--	--	--	--	--	--	--	--	--	4EA	4EA	4FA	4FA	4FA	4FA	4FA
		Set value in A	15	15	16	16	17	17	18	19	20	25	25	26	27	28	30	31	32	34
4AU39 1	12.5	3RV10 21-□□□10	4CA	4CA	4CA	4CA	4DA	4DA	4DA	4DA	4DA	--	--	--	--	--	--	--	--	--
		3RV10 31-□□□10	--	--	--	--	--	--	--	--	--	4FA	4FA	4FA	4FA	4FA	4FA	4FA	4FA	4GA
		Set value in A	9	19	20	20	20	22	22	23	25	30	31	32	34	35	37	39	40	43
4AU39 3	16	3RV10 21-□□□10	4DA	4DA	4DA	4DA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		3RV10 31-□□□10	--	--	--	--	4EA	4FA	4FA	4FA	4FA	4FA	4FA	4FA	4HA	4HA	4HA	4HA	4HA	4HA
		Set value in A	24	24	25	25	26	28	28	30	31	38	39	40	43	44	47	49	50	50

Secondary-side short-circuit and overload protection with motor starter protector or miniature circuit breaker

Transformers	Rated power P_n	Motor starter protectors			Miniature circuit breakers (MCBs)		
		Version: Motor protection[1]	Rated output voltage U_{2N} in V			Rated output voltage U_{2N} in V	
Type	kVA	Type	230	115	Type	400	230
4AP transformers							
4AP17 4	0.16	3RV10 11-□□□10	0DA	0FA	5SX2 □□□-7	--	--
		Set value in A	0.27	0.5	Current value in A	--	--
4AP18 4	0.25	3RV10 11-□□□10	0FA	0HA	5SX2 □□□-7	--	--
		Set value in A	0.42	0.75	Current value in A	--	--
4AP19 4	0.4	3RV10 11-□□□10	0HA	0KA	5SX2 □□□-7	--	--
		Set value in A	0.7	1.2	Current value in A	--	--
4AP20 4	0.63	3RV10 11-□□□10	0KA	1BA	5SX2 □□□-7	101	--
		Set value in A	1.1	1.9	Current value in A	1	--
4AP21 4	1	3RV10 11-□□□10	1BA	1DA	5SX2 □□□-7	115	103
		Set value in A	1.7	3	Current value in A	1.6	3
4AP25 4	1.6	3RV10 11-□□□10	1DA	1FA	5SX2 □□□-7	--	--
		Set value in A	2.7	5	Current value in A	--	--
4AP27 4	2.5	3RV10 11-□□□10	1FA	1HA	5SX2 □□□-7	104	--
		Set value in A	4.2	7.5	Current value in A	4	--
4AP30 4	4	3RV10 11-□□□10	1HA	1KA	5SX2 □□□-7	--	--
		Set value in A	6.7	12	Current value in A	--	--
4AP30 5	5	3RV10 11-□□□10	1JA	--	5SX2 □□□-7	108	--
		3RV10 21-□□□10	--	4AA			
		Set value in A	8.5	15	Current value in A	8	--
4AU transformers							
4AU30 3	6.3	3RV10 11-□□□10	1KA	--	5SX2 □□□-7	110	--
		3RV10 21-□□□10	--	4BA			
		Set value in A	11	19	Current value in A	10	--
4AU36 1	8	3RV10 21-□□□10	4AA	4DA	5SX2 □□□-7	113	--
		Set value in A	14	24	Current value in A	13	--
4AU36 3	10	3RV10 21-□□□10	4BA	--	5SX2 □□□-7	116	--
		3RV10 31-□□□10	--	4EA			
		Set value in A	17	29	Current value in A	16	--
4AU39 1	12.5	3RV10 21-□□□10	4CA	--	5SX2 □□□-7	120	--
		3RV10 31-□□□10	--	4FA			
		Set value in A	21	37	Current value in A	20	--
4AU39 3	16	3RV10 31-□□□10	4EA	4HA	5SX2 □□□-7	--	--
		Set value in A	27	47	Current value in A	--	--

Short-time rating of control transformers $P_{shortt.}$[1] = f (p.f.) for $U_2 = 0.95 \times U_{2N}$

Trans-formers	Rated power P_n	Short-time rating $P_{shortt.}$[1] with p.f. of										Voltage rise in no load operation (operating temperature)	Voltage drop on rated load (at 20 °C)	Short-circuit voltage (at 20 °C)
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1			
Type	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	kVA	u_A %	u_R %	u_Z %
4AP transformers														
4AP20 4	0.63	4.5	3.3	2.6	2.1	1.8	1.6	1.4	1.3	1.2	1.1	9.3	6.8	6.8
4AP21 4	1	9.3	6.5	5	4.1	3.5	3	2.7	2.4	2.2	2.1	6.4	4.8	4.8
4AP25 4	1.6	21	14	10	8.3	6.9	5.9	5.2	4.7	4.2	3.9	4.9	3.6	3.6
4AP27 4	2.5	37	24	17	14	11	9.9	8.7	7.8	7	6.5	4.5	3.4	3.4
4AP30 4	4	60	40	30	24	20	18	16	14	13	12	3.5	2.6	2.7
4AP30 5	5	53	41	34	29	25	22	20	19	18	17	2.8	2.1	2.2
4AU transformers														
4AU30 3	6.3	64.5	48.5	39	32.5	28	25	22.5	20.5	19	18.5	3.5	2.6	2.6
4AU36 1	8	83	58.5	45	37	31.5	27.5	24	22	20	19	5.1	3.6	3.6
4AU36 3	10	80.5	63	52	44	39	35	31.5	29	27.5	27	4.1	2.9	3
4AU39 1	12.5	104	80.5	66	56	49	44	39.5	36	34.5	34	4.1	2.9	3.1
4AU39 3	16	85	74	66	60	55	51.5	48.5	46.5	46	51	3.2	2.3	2.8

[1] $P_{shortt.}$ applies to up to 300 contactor operations per hour.