## SIEMENS

## Data sheet

## US2:22CUD32AH



Reversing motor starter Size 0 Three phase full voltage Solid-state overload relay OLRelay amp range 5.5-22A 380-440/440-480V 50/60HZ coil Non-combination type Enclosure type (open)

product brand name         Class 22           design of the product feature         Full-voltage reversing motor starter           special product feature         ESP200 overload relay           General technical data         ESP200 overload relay           weight [b]         6 lb           Height x Width x Depth [in]         7.69 × 10.5 × 3.92 in           touch protection against electrical shock         Not finger-safe           installation altitude [II] at height above sea level maximum         6860 ft           ambient temperature [VF]         -22 +149 "F           • during operation         -4 +104 "F           ambient temperature         -30 +65 °C           • during operation         -20 +40 "C           country of origin         Mexico           Horsepower ratings         -yielded mechanical performance [hp] for 3-phase AC           wotor         - at 200/208 V rated value         3 hp           • at 200/208 V rated value         3 hp         -           • at 200/208 V rated value         0 hp         -           • at 200/208 V rated value         0 hp         -           size of contactor         number of NO contacts for main contacts         3           operating voltage formain current circuit at AC at 60 Hz         1000 V	Figure similar	
special product feature         ESP200 overload relay           General tochnical data         6 lb           weight [lb]         6 lb           Height X Width X Depth [in]         7.69 × 10.5 × 3.92 in           touch protection against electrical shock         Not finger-safe           installation altitude [ft] at height above sea level maximum         ambient temperature [*F]           • during operation         -4+104 "F           ambient temperature         -30+65 "C           • during operation         -20+440 "C           arbitry of origin         Mexico           Horsopower ratings         -20+40 "C           vielded mechanical performance [hp] for 3-phase AC         Mexico           motor         at 200/208 V rated value         3 hp           • at 200/208 V rated value         3 hp         -4+104 "F           wideld mechanical performance [hp] for 3-phase AC         -0	product brand name	Class 22
General technical data       6 lb         weight [lb]       6 lb         Height x Width x Depth [in]       7.69 × 10.5 × 3.92 in         touch protection against electrical shock       Not finger-safe         installation altitude [l] at height above sea level maximum       6560 ft         ambient temperature ['F]       -22 +149 °F         • during operation       -24 +104 °F         ambient temperature       -30 +65 °C         • during operation       -20 +40 °C         county of origin       Mexico         Hosepower ratings       -30 +65 °C         yielded mechanical performance [hp] for 3-phase AC       -20 +40 °C         motor       - at 200/208 V rated value       3 hp         • at 200/208 V rated value       3 hp         • at 200/208 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 450/480 V rated value       0 hp         contactor       Step of contacts for main contacts         size of contactor       1000000         number of NC contacts for ania contacts       3         operating voltage for main current circuit at AC at 60 Hz       00 V         maximum       0       10000000         contacts typical       10000000       1	design of the product	Full-voltage reversing motor starter
weight [lb]       6 lb         Height x Width x Depth [in]       7.69 × 10.5 × 3.92 in         touch protection against electrical shock       Not finger-safe         installation altitude [ft] at height above sea level maximum       6560 ft         ambient temperature ['F]       - during storage         • during storage       -22 +149 "F         • during operation       -4 +104 "F         ambient temperature       -30 +65 "C         • during operation       -20 +40 "C         country of origin       Mexico         Hosspower ratings       yielded mechanical performance [hp] for 3-phase AC         motor       • at 220/280 V rated value       3 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 575/600 V rated value       3 a         operating voltage for main current circuit at AC at 60 Hz       3         maximum       600 V         maximum       10000000         operating voltage for main current dircuit at AC at 60 Hz       1         maximum       10000000         operating voltage for main current dircuit at AC at 60 Hz       1         maximum       0       1      <	special product feature	ESP200 overload relay
Height x Width x Depth [in]       7.69 × 10.5 × 3.92 in         touch protection against electrical shock       Not finger-safe         installation allitude [ft] at height above sea level maximum       6660 ft         ambient temperature [F]       -22 +149 °F         • during operation       -4 +104 °F         ambient temperature       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings       yielded mechanical performance [hp] for 3-phase AC motor         • at 200/208 V rated value       3 hp         • at 200/208 V rated value       3 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       1 hp         • at 460/480 V rated value       0 hp         • at 650 for main current circuit at AC at 60 Hz       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       18 A         operational current at AC at 600 V rated value       18 A         mother of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts	General technical data	
Use protection against electrical shock       Not finger-safe         installation altitude [ft] at height above sea level maximum       6560 ft         ambient temperature ['F]	weight [lb]	6 lb
installation altitude [t] at height above sea level maximum       6560 ft         ambient temperature ['F]       -22 +149 °F         • during operation       -4 +104 °F         ambient temperature       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings       -30 +65 °C         yielded mechanical performance [hp] for 3-phase AC motor       at 220/230 V rated value         • at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp         • at 450/480 V rated value       0 hp         Contactor       NEMA controller size 0         number of NO contacts for main current circuit at AC at 60 Hz       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       operating voltage for main current circuit at AC at 60 Hz         maximum       0         operating voltage for main current circuit at AC at 60 Hz         maximum       18 A         mechanical service life (switching cycles) of the main contacts 1         number of NC contacts at contactor for auxiliary contacts       1         number of NO contacts at a contactor for auxiliary contacts       1         number of total auxiliary contacts of contactor according to U.L	Height x Width x Depth [in]	7.69 × 10.5 × 3.92 in
ambient temperature ["F]       -22 +149 "F         • during storage       -22 +149 "F         • during storage       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings         yielded mechanical performance [hp] for 3-phase AC         motor       • at 200/208 V rated value         • at 200/208 V rated value       3 hp         • at 200/208 V rated value       3 hp         • at 200/208 V rated value       0 hp         • contactor       •         size of contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       18 A         operational current at AC at 600 V rated value       1 <td>touch protection against electrical shock</td> <td>Not finger-safe</td>	touch protection against electrical shock	Not finger-safe
	installation altitude [ft] at height above sea level maximum	6560 ft
• during operation       -4 +104 °F         ambient temperature       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings	ambient temperature [°F]	
ambient temperature       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings       yielded mechanical performance [hp] for 3-phase AC         motor       • at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp         • at 220/230 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 575/600 V rated value       0 hp         Contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       10000000         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts 1       10000000         number of NO contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1 <t< td=""><td><ul> <li>during storage</li> </ul></td><td>-22 +149 °F</td></t<>	<ul> <li>during storage</li> </ul>	-22 +149 °F
• during storage       -30 +65 °C         • during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings	<ul> <li>during operation</li> </ul>	-4 +104 °F
• during operation       -20 +40 °C         country of origin       Mexico         Horsepower ratings       Mexico         yielded mechanical performance [hp] for 3-phase AC motor       at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp       at 220/230 V rated value       0 hp         • at 450/480 V rated value       0 hp       0 hp       0         • at 575/600 V rated value       0 hp       0       0         • at 575/600 V rated value       0 hp       0       0         size of contactor       NEMA controller size 0       0         number of NO contacts for main contacts       3       000 V         maximum       00perational current circuit at AC at 60 Hz       600 V         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       1       10000000         number of NC contacts at contactor for auxiliary contacts       0       1         number of NO contacts at contactor for auxiliary contacts       1       1         number of NC contacts at contactor for auxiliary contacts       1       1         number of NC contacts at contactor for auxiliary contacts       1       1         number of NO contacts at contactor for auxiliary contacts       1<	ambient temperature	
country of origin       Mexico         Horsepower ratings	<ul> <li>during storage</li> </ul>	-30 +65 °C
Horsepower ratings         yielded mechanical performance [hp] for 3-phase AC motor         • at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp         • at 460/480 V rated value       0 hp         • at 4575/600 V rated value       0 hp         • at 575/600 V rated value       0 hp         contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz maximum       600 V         operational current at AC at 600 V rated value       18 A         operational current at AC at 600 V rated value       18 A         mumber of NC contacts at contactor for auxiliary contacts       0         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts of contactor according to UL       8         contact rating of auxiliary contacts of contact according to UL       10A@600VAC (A600), 5A@600VDC (P600)         coli       to UL       AC	<ul> <li>during operation</li> </ul>	-20 +40 °C
yielded mechanical performance [hp] for 3-phase AC motor       at 200/208 V rated value       3 hp         • at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 450/00 V rated value       0 hp         • at 575/600 V rated value       0 hp         Contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts do contacts at contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         coil       toUL       10A@600VAC (A600), 5A@600VDC (P600)	country of origin	Mexico
motor       • at 200/208 V rated value       3 hp         • at 220/230 V rated value       3 hp         • at 420/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 460/480 V rated value       0 hp         • at 575/600 V rated value       0 hp         Contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts of contactor according to UL       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         coil	Horsepower ratings	
• at 220/230 V rated value         3 hp           • at 460/480 V rated value         0 hp           • at 575/600 V rated value         0 hp           • at 575/600 V rated value         0 hp           Contactor         NEMA controller size 0           number of NO contacts for main contacts         3           operating voltage for main current circuit at AC at 60 Hz         600 V           maximum         600 V           operational current at AC at 600 V rated value         18 A           mechanical service life (switching cycles) of the main contacts typical         10000000           Auxiliary contacts at contactor for auxiliary contacts         0           number of NC contacts at contactor for auxiliary contacts         1           number of NC contacts at contactor for auxiliary contacts         1           number of NO contacts of contactor according to UL         10A@600VAC (A600), 5A@600VDC (P600)           contact rating of auxiliary contacts of contactor according to UL         10A@600VAC (A600), 5A@600VDC (P600)	5 1 613 1	
• at 460/480 V rated value0 hp• at 575/600 V rated value0 hpContactorNEMA controller size 0size of contactorNEMA controller size 0number of NO contacts for main contacts3operating voltage for main current circuit at AC at 60 Hz600 Vmaximum18 Aoperational current at AC at 600 V rated value18 Amechanical service life (switching cycles) of the main contacts typical10000000Auxiliary contact0number of NC contacts at contactor for auxiliary contacts1number of NO contacts at contactor for auxiliary contacts1number of total auxiliary contacts of contactor according to UL10A@600VAC (A600), 5A@600VDC (P600)CoilAC	• at 200/208 V rated value	3 hp
• at 575/600 V rated value       0 hp         Contactor       size of contactor         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of NC contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts of contactor according to UL       8         Contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         to UL       AC	• at 220/230 V rated value	3 hp
Contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts of contacts at contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       AC	• at 460/480 V rated value	0 hp
size of contactor       NEMA controller size 0         number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       AC	• at 575/600 V rated value	0 hp
number of NO contacts for main contacts       3         operating voltage for main current circuit at AC at 60 Hz       600 V         maximum       600 V         operational current at AC at 600 V rated value       18 A         mechanical service life (switching cycles) of the main contacts typical       10000000         Auxiliary contact       0         number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       AC	Contactor	
operating voltage for main current circuit at AC at 60 Hz maximum600 Voperational current at AC at 600 V rated value18 Amechanical service life (switching cycles) of the main contacts typical1000000Auxiliary contact0number of NC contacts at contactor for auxiliary contacts0number of NO contacts at contactor for auxiliary contacts1number of total auxiliary contacts maximum8contact rating of auxiliary contacts of contactor according to UL10A@600VAC (A600), 5A@600VDC (P600)CoilKype of voltage of the control supply voltage	size of contactor	NEMA controller size 0
maximum     operational current at AC at 600 V rated value     18 A       mechanical service life (switching cycles) of the main contacts typical     10000000       Auxiliary contact     10000000       number of NC contacts at contactor for auxiliary contacts     0       number of NO contacts at contactor for auxiliary contacts     1       number of total auxiliary contacts maximum     8       contact rating of auxiliary contacts of contactor according to UL     10A@600VAC (A600), 5A@600VDC (P600)       Coil     Coil       type of voltage of the control supply voltage     AC	number of NO contacts for main contacts	3
mechanical service life (switching cycles) of the main contacts typical       1000000         Auxiliary contact       1000000         number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       4         type of voltage of the control supply voltage       AC		600 V
contacts typical       Auxiliary contact         number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       4C	operational current at AC at 600 V rated value	18 A
number of NC contacts at contactor for auxiliary contacts       0         number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       4C		1000000
number of NO contacts at contactor for auxiliary contacts       1         number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       4         type of voltage of the control supply voltage       AC	Auxiliary contact	
number of total auxiliary contacts maximum       8         contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       type of voltage of the control supply voltage         AC	number of NC contacts at contactor for auxiliary contacts	0
contact rating of auxiliary contacts of contactor according to UL       10A@600VAC (A600), 5A@600VDC (P600)         Coil       type of voltage of the control supply voltage       AC	number of NO contacts at contactor for auxiliary contacts	1
to UL Coil type of voltage of the control supply voltage AC	number of total auxiliary contacts maximum	8
type of voltage of the control supply voltage AC		10A@600VAC (A600), 5A@600VDC (P600)
	Coil	
control supply voltage	type of voltage of the control supply voltage	AC
	control supply voltage	

	000 440.14
at AC at 50 Hz rated value	380 440 V
at AC at 60 Hz rated value	440 480 V
holding power at AC minimum	8.6 W
apparent pick-up power of magnet coil at AC	218 VA
apparent holding power of magnet coil at AC	25 VA
operating range factor control supply voltage rated value of magnet coil	0.85 1.1
percental drop-out voltage of magnet coil related to the input voltage	50 %
ON-delay time	19 29 ms
OFF-delay time	10 24 ms
Overload relay	
product function	
<ul> <li>overload protection</li> </ul>	Yes
<ul> <li>phase failure detection</li> </ul>	Yes
<ul> <li>asymmetry detection</li> </ul>	Yes
<ul> <li>ground fault detection</li> </ul>	Yes
test function	Yes
external reset	No
reset function	Manual, automatic and remote
trip class	CLASS 5 / 10 / 20 (factory set) / 30
adjustable current response value current of the current- dependent overload release	5.5 22 A
make time with automatic start after power failure maximum	3 s
relative repeat accuracy	1 %
product feature protective coating on printed-circuit board	Yes
number of NC contacts of auxiliary contacts of overload	1
relay	
number of NO contacts of auxiliary contacts of overload relay	1
operational current of auxiliary contacts of overload relay	
• at AC at 600 V	5 A
• at DC at 250 V	1 A
contact rating of auxiliary contacts of overload relay according to UL	5A@600VAC (B600), 1A@250VDC (R300)
insulation voltage (Ui)	
<ul> <li>with single-phase operation at AC rated value</li> </ul>	600 V
<ul> <li>with multi-phase operation at AC rated value</li> </ul>	300 V
Enclosure	
degree of protection NEMA rating	Open device (no enclosure)
design of the housing	NA
Mounting/wiring	
mounting position	Vertical
fastening method	Surface mounting and installation
type of electrical connection for supply voltage line-side	Screw-type terminals
tightening torque [lbf·in] for supply	20 20 lbf·in
type of connectable conductor cross-sections at line-side	1x (14 2 AWG)
at AWG cables single or multi-stranded temperature of the conductor for supply maximum permissible	75 °C
material of the conductor for supply	AL or CU
type of electrical connection for load-side outgoing feeder	Screw-type terminals 20 20 lbf·in
tightening torque [lbf·in] for load-side outgoing feeder type of connectable conductor cross-sections at AWG	
cables for load-side outgoing feeder single or multi- stranded	1x (14 2 AWG)
temperature of the conductor for load-side outgoing feeder maximum permissible	75 °C
material of the conductor for load-side outgoing feeder	AL or CU
type of electrical connection of magnet coil	Screw-type terminals
tightening torque [lbf·in] at magnet coil	5 12 lbf·in
type of connectable conductor cross-sections of magnet	2x (16 12 AWG)

coil at AWG cables single or multi-stranded			
temperature of the conductor at magnet coil maximum permissible	75 °C		
material of the conductor at magnet coil	CU		
type of electrical connection for auxiliary contacts	Screw-type terminals		
tightening torque [lbf·in] at contactor for auxiliary contacts	10 15 lbf·in		
type of connectable conductor cross-sections at contactor at AWG cables for auxiliary contacts single or multi- stranded	1x (12 AWG), 2x (16 14 AWG), 2x (18 16 AWG)		
temperature of the conductor at contactor for auxiliary contacts maximum permissible	75 °C		
material of the conductor at contactor for auxiliary contacts	CU		
type of electrical connection at overload relay for auxiliary contacts	Screw-type terminals		
tightening torque [lbf·in] at overload relay for auxiliary contacts	7 10 lbf·in		
type of connectable conductor cross-sections at overload relay at AWG cables for auxiliary contacts single or multi- stranded	2x (20 14 AWG)		
temperature of the conductor at overload relay for auxiliary contacts maximum permissible	75 °C		
material of the conductor at overload relay for auxiliary contacts	CU		
Short-circuit current rating			
design of the fuse link for short-circuit protection of the main circuit required	10kA@600V (Class H or K); 100kA@600V (Class R or J)		
design of the short-circuit trip	Thermal magnetic circuit breaker		
breaking capacity maximum short-circuit current (Icu)			
• at 240 V	14 kA		
• at 480 V	10 kA		
● at 600 V	10 kA		
certificate of suitability	NEMA ICS 2; UL 508; CSA 22.2, No.14		
Further information			
Industrial Controls - Product Overview (Catalogs, Brochures,) www.usa.siemens.com/iccatalog Industry Mall (Online ordering system) https://mall.industry.siemens.com/mall/en/us/Catalog/product?mlfb=US2:22CUD32AH Service&Support (Manuals, Certificates, Characteristics, FAQs,) https://support.industry.siemens.com/cs/US/en/ps/US2:22CUD32AH Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros,) http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=US2:22CUD32AH⟨=en Certificates/approvals			
https://support.industry.siemens.com/cs/US/en/ps/US2:22CU	https://support.industry.siemens.com/cs/US/en/ps/US2:22CUD32AH/certificate		

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