Contactores modulares hasta 25 A

TECHNICAL DATA

	Type	Symbol	Unit	IK21	HYC216 HYC216-R HYC216-T	HYC216 HYC216-R HYC216-T	HYC20 HYC20-R HYC20-T	HYC20 HYC20-R HYC20-T	HYC225 HYC225-R HYC225-T	HYC225 HYC225-R HYC225-T
GENERAL	Standards			IEC/EN 61095, IEC/EN 60947-4-1, IEC/EN 60947-5-1						
	Approvals			CE, EAC	CE		CE, CB, NF, EAC		CE	
	Module width			2	1					
	Number of poles			4	2					
	Degree of protection			IP20 (IP40 when installed in installation box - distribution board)						
	Pollution degree			3						
	Climatic conditions			95 % relative humidity						
	Ambient temperature (open)		°C	-15 … +55 [4]						
	Storage temperature		°C	-30... +80						
	Maximum altitude $\bar{U}_i$ and U_e is reduced for 1.2 % and I_e for 0.4 % for every additional 100 m		m	2000						
	Number of contactors or switches side-by-side: <40 °C (40 … 55) °C			no limitation	max. 3 max. 2					
	Noise level (operation)		dB	30	30	20	30	20	30	20
	Vibration resistance according to IEC/EN 60068-2-6	a	g	switched off: 2 (Z and X axis) / switched on: 3 (Z axis) and 1 (X axis)						
	Shock resistance according to IEC/EN 6068-2-27	a	g	switched off: 10 (Z and X axis) / switched on: 15 (Z axis) and 2 (X axis)						
	Maximum operating frequency with no load		op. c./h	3.000						
	Mechanical endurance		op. c.	3.000.000		10.000.000	3.000.000	10.000.000	3.000.000	10.000.000
	Weight		g	170	130	130	130	130	130	130
MAIN CIRCUIT	Contact reliability			>17 V; >50 mA						
	Minimum distance of open contacts		mm	3.6						
	Power dissipation per pole		W	2.0	1.2	1.2	1.7	1.7	2.0	2.0
	Overload current withstand capability: 10 s		A	40	56		72			
	Maximum back-up fuse for short-circuit protection gL and gG: coordination type 1	I_v	A						25	25
	coordination type 2			20	16	16	20	20		
	Rated insulation voltage	U_i	V	415	440					
	Rated impulse withstand voltage	U_{imp}	kV	4						
	Rated operational voltage	U_e	V	400	400 [2] [3]					
	Rated frequency	f	Hz	50/60						
	Thermal current	I_{th}	A	20	16		20		25	
	Rated operational current for AC-1, AC-7a and AC-21	I_e	A	20	16		20		25	
	Operational power for AC-1, AC-7a and AC-21: single-phase 230 V	P_e	kW		3.5		4		5.4	
	three-phase 230 V			7.5						
	three-phase 400 V			13						
	Maximum operating frequency for AC-1, AC-7a and AC-21		op. c./h	600						
	Electrical endurance for AC-1, AC-7a and AC-21		op. c.	200.000						
	Rated operational current for AC-2	I_e	A	10			12		14	
	Operational power for AC-2: single-phase 230 V	P_e	kW		1.5		1.8		2.0	
	three-phase 230 V			2.5						
	three-phase 400 V			4.5						
	Maximum operating frequency for AC-2		op. c./h	120						
	Electrical endurance for AC-2		op. c.	100.000						
	Rated operational current for AC-22	I_e	A	20	16		20		25	
	Operational power for AC-22: single-phase 230 V	P_e	kW	3.7	2.9		3.7		4.6	
	three-phase 230 V			6.3						
	three-phase 400 V			11						
	Maximum operating frequency for AC-22		op. c./h	300						
	Electrical endurance for AC-22		op. c.	50.000						
	Rated operational current for AC-3, AC-7b and AC-23	I_e	A	5	NO: 7 / NC: 4		NO: 9 / NC: 6			
	Operational power for AC-3, AC-7b and AC-23: single-phase 230 V	P_e	kW	0.37	NO: 1.1 / NC: 0.55		NO: 1.3 / NC: 0.75			
	three-phase 230 V			1.1						
	three-phase 400 V			2.2						
	Maximum operating frequency for AC-3, AC-7b and AC-23		op. c./h	600						
	Electrical endurance for AC-3, AC-7b and AC-23		op. c.	300.000						

[1] Available approvals only CE

[2] Rated operational voltage between two line (phase) conductors

[3] Rated operational voltage for versions of contacts -10 and-01 is 230 V

[4] Ambient temperature (open) -25...+55 °C for version with 2NO and 4NO contacts

TECHNICAL DATA

	Type	Symbol	Unit	IK21	HYC216 HYC216-R HYC216-T	HYC216 HYC216-R HYC216-T	HYC20 HYC20-R HYC20-T	HYC20 HYC20-R HYC20-T	HYC225 HYC225-R HYC225-T	HYC225 HYC225-R HYC225-T
MAIN CIRCUIT	Rated operational current for AC-5a (at 230 V)	I_e	A	8.8					11.2	
	Maximum operating frequency for AC-5a		op. c./h	600						
	Electrical endurance for AC-5a		op. c.	100.000						
	Rated operational current for AC-5b (at 230 V)	I_e	A	8.8					9.7	
	Maximum operating frequency for AC-5b		op. c./h	600						
	Electrical endurance for AC-5b		op. c.	100.000						
	Rated operational current for AC-6a (at 230 V)	I_e	A	4					4.8	
	Maximum operating frequency for AC-6a		op. c./h	600						
	Electrical endurance for AC-6a		op. c.	100.000						
	Switching of capacitors AC-6b and AC-7c (at 230 V)	C	µF	30					36	
	Maximum operating frequency for AC-6b and AC-7c		op. c./h	600						
	Electrical endurance for AC-6b and AC-7c		op. c.	100.000						
	Rated operational current for DC-1 (L/R ≤ 1 ms):									
	1 pole … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/12/6/2/0.5	16/12/8/4/0.5		20/15/10/6/0.6		25/20/15/6/0,6	
	2 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC	I_e	A	20/15/10/4/1.5	16/15/12/8/0.4		20/18/15/10/6		25/25/20/10/6	
	3 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/20/6/2.5						
	4 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/20/6/3.5						
	Maximum operating frequency for DC-1		op. c./h	300						
	Electrical endurance for DC-1		op. c.	100.000						
	Rated operational current for DC-3 (L/R ≤ 2 ms):									
	1 pole … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			10/5/2/1/0.1					15/8/4/1.3/0.2	
	2 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC	I_e	A	20/10/8/4/0.4	16/10/8/4/0.4		20/10/8/4/0.4		25/16/12/5.5/0.6	
	3 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/15/6/2.5						
	4 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/15/6/3.5						
	Maximum operating frequency for DC-3		op. c./h	300						
	Electrical endurance for DC-3		op. c.	100.000						
	Rated operational current for DC-5 (L/R < 7.5 ms):									
	1 pole … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			10/4/1/0.3/0.06					15/5/3/0.5/0.1	
	2 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC	I_e	A	20/8/6/2/0.2	16/8/6/2/0.2		20/8/6/2/0.2		25/15/10/4/0.4	
	3 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/15/5/1.5						
	4 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			20/20/15/5/3						
	Maximum operating frequency for DC-5		op. c./h	300						
	Electrical endurance for DC-5		op. c.	100.000						
	Terminal capacity:									
	rigid (solid and stranded)	S	mm^2	1 … 2.5	1 … 10					
	flexible			1 … 2.5	1 … 6					
	Length of removed wire insulation		mm	9						
	Screw			M3.5						
	Screw head			PZ2	PZ1					
	Tightening torque		Nm	1.2						
AUXILIARY CIRCUIT	Contact reliability			>17 V; >50 mA						
	Minimum distance of open contacts		mm	3.6						
	Power dissipation per pole		W	2	1.3	1.3	1.7	1.7	2	2
	Overload current withstand capability:									
	10 s		A	40	56		72			
	Maximum back-up fuse for short-circuit protection gL and gG:									
	coordination type 1	I_v	A						25	25
	coordination type 2			20	16	16	20	20		
	Rated insulation voltage	U_i	V	415	440					
	Rated impulse withstand voltage	U_{imp}	kV	4						
	Rated operational voltage	U_e	V	230/400						
	Rated frequency	f	Hz	50/60						
	Thermal current	I_{th}	A	20	16		20		25	
	Rated operational current for AC-15:									
	single-phase 230 V	I_e	A	6						
	single-phase 400 V			4						
	Maximum operating frequency for AC-15		op. c./h	1200	600					
	Electrical endurance for AC-15		op. c.	200.000	300.000					
	Rated operational current for DC-13:									
	1 pole … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			6/4/1/0.3/0.05						
	2 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC	I_e	A	6/6/4/1/0.1						
	3 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			6/6/6/3/1						
	4 poles in series … 24 V DC/48 V DC/60 V DC/110 V DC/220 V DC			6/6/6/4/2						

TECHNICAL DATA

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AUXILIARY CIRCUIT	Maximum operating frequency for DC-13		op. c./h	300						
	Electrical endurance for DC-13		op. c.	200.000						
	Terminal capacity: rigid (solid and stranded) flexible	S	mm^2	1 … 2.5 1 … 2.5	1 … 10 1 … 6					
	Length of removed wire insulation		mm	9						
	Screw			M3.5						
	Screw head		mm	PZ2	PZ1					
	Tightening torque			1.2						
COIL	Range of control voltage for switch-on	U_c	%	85 ... 110						
	Range of control voltage for drop out	U_c	%	AC: 75 … 20 / DC: 75 … 10 (where is applicable)						
	Kind of voltage			AC	AC	AC/DC	AC	AC/DC	AC	AC/DC
	Standard control voltages	U_c	V	12, 24, 48, 120, 230, 400	12, 24, 48, 120, 230					
	Frequency of AC control voltage	f	Hz	50/60	50/60	40 … 500	50/60	40 … 500	50/60	40 … 500
	Control mode			remote control with U_c / manual control only for types with -R and -T						
	Impulse duration of control voltage: minimum maximum			permanent permanent						
	Minimum duration between two impulses of control voltage		ms	AC: 150 / DC: 500 (where is applicable)						
	Surge immunity withstand voltage 1.2/50 µs acc. to standard IEC/EN 61000-4-5		kV	2						
	Coil consumption: switch-on operation		VA/W	30/25 5/1.5	12/10 2.8/1.2	2.1/2.1 2.1/2.1	12/10 2.8/1.2	2.1/2.1 2.1/2.1	12/10 2.8/1.2	2.1/2.1 2.1/2.1
	Delays: make brake		ms	7 … 20 10 … 20	15 … 25 10 … 30	15 … 45 20 … 50	15 … 25 10 … 30	15 … 45 20 … 50	15 … 25 10 … 30	15 … 45 20 … 50
	Terminal capacity: rigid (solid and stranded) flexible		mm^2	1 … 2.5 1 … 2.5						
	Length of removed wire insulation		mm	9	7					
	Screw			M3.5	M3					
	Screw head			PZ2	PZ1					
	Tightening torque		Nm	1.2	0.6					
SAFETY	MTTF - Mean time to failure MTTF = $1/\lambda$ = B10/(0.1 n_{op})		h	AC-1: 5.000 AC-3: 7.500						
	$MTTF_d$ - Mean time to failure dangerous MTTFd = $1/\lambda_d$ = $B10_d$/(0.1 n_{op})		h	AC-1: 6.666 AC-3: 10.000						
	B10 - Number of operating cycles until 10 % of devices fail		op. c.	AC-1: 150.000 AC-3: 225.000						
	$B10_d$ - Number of operating cycles until 10 % of device dangerous $B10_d$ = B10/ratio of dangerous failures		op. c.	AC-1: 200.000 AC-3: 300.000						
	λ - Failure rate λ = (0.1 n_{op})/B10		1/h	AC-1: 0.0002 AC-3: 0.000133						
	λ_d - Failure rate dangerous λ_d = (0.1 n_{op})/$B10_d$		1/h	AC-1: 0.00015 AC-3: 0.0001						
	Ratio of dangerous failures		%	75						
	n_{op} - Operating cycles (operating cycles/h)		op. c./h	300						