

Circuit Breakers, Switch Disconnectors

Additional technical Information for NZM Circuit Breakers

Protection of PVC insulated cables against thermal overload due to short-circuits

According to VDE 0100 Part 430 Wiring Regulations, cables and conductors must be protected from overload and short-circuits. In circuit-breakers NZM, overload protection is implemented through the adjustable, currentdependently delayed over load release.

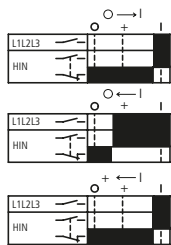
Short-circuit protection is provided by adjustable instantaneous releases, which open the main contacts in less than 25 ms. The short-circuit total opening time restricts the temperature rise of the cable to a minimum.

The tables indicate the minimum conductor cross-section reliably protected by circuit-breakers during a short-circuit.
(Operating voltage $U_N = 415 \text{ V}$)

	Minimum protected cross-section mm ² copper
NZM ...1 (-4)-... 20	6
NZM ...1 (-4)-... 25-160	10
NZM ... 2(-4)-... 20-300	10
NZM ...3 (-4)-...2 50-630	16
NZM ... 4(-4)-...6 30-1600	95

Contact sequence of the auxiliary contacts

Standard auxiliary contacts (HIN)



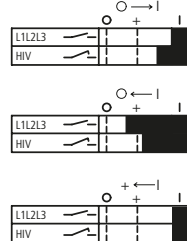
O → I Switch-on

O ← I Switch-off

+ ← I Trip

Early-make auxiliary contact (HIV)

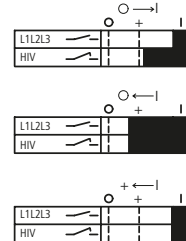
NZM 1,2,3



■ Contact closed

□ Contact opened

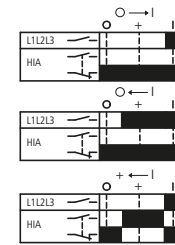
NZM 1,2,3



Notes:

If early-make contacts are required in combination with shunt or undervoltage releases, please select the combination type in section „Releases“:

Trip-indicating auxiliary contacts (HIA)



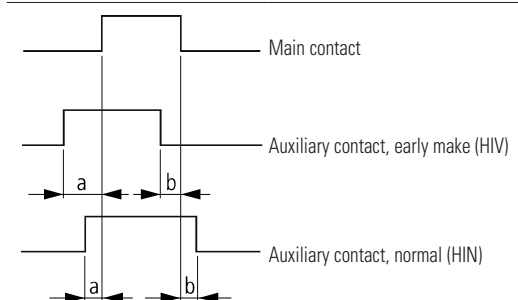
Maximum equipment and position of the built-in accessories

	③	②	①
-XHIV(2S)		HIA	HIN
or -XA			
or -XU			

	③	②	①
NZM1, N(S)1	1	1	1
NZM2, N(S)2	1	1	2
NZM3, N(S)3	1	1	3
NZM4, N(S)4	1	2	3
PN1	1	-	1
PN2	1	-	2
PN3	1	-	3

Notes: On combination with remote operator NZM-XR..., the right slot for standard auxiliary contacts HIN can be equipped only with single contacts.

Time differences ON-OFF



	Time difference a (ms)			Motor drive			Zeitdifferenz b (ms)			Motor drive		
	HIV	HIN	K01	HIV	HIN	K01	HIV	HIN	K01	HIV	HIN	K01
NZM 1	20 ²⁾	0	2.5	-	-	-	20 ²⁾	0	2.5	-	-	-
NZM 2	20 ²⁾	3.5	6.5	Not permissible	2.5	4.5	20 ²⁾	3	4.5	Not permissible	3	4
NZM 3	20 ²⁾	4	8	Not permissible	2	4	20 ²⁾	3.5	8	Not permissible	3	6.5
NZM 4	90 ²⁾	7	11	Not permissible	Please inquire	Please inquire	0 ¹⁽²⁾	12	15	Not permissible	Please inquire	Please inquire

Notes: ¹⁾ With NZM4/N(S)4 the HIV does not feature early break.

²⁾ Minimum value, as it is dependent on the switching speed.

Protective separation in accordance with EN 61140 (Annex N) up to Ue [V]

From/To	NZM...- XBSM ¹⁾	...RCAM- MRTU-I ¹⁾	USB ¹⁾	NZM...- X... 2A(PI) ¹⁾	NZM...- XU...	NZM...- XA...	NZM...- -X... HIV...	HIN (M22- K...)	HIA (M22- K...)	HIN (M22- CK...)	HIA (M22- CK...)
NZM1/2/3/4 Main contacts	690	690	690	500	500	500	500	500	500	500	500
NZM-X...2A(PI) ¹⁾	250	250	250	-	250	250	250	250	250	250	250
NZM-XU...	600	600	600	250	-	-	300	300	300	300	300
NZM-XA...	600	600	600	250	-	-	300	300	300	300	300
NZM...-X...HIV...	500	500	500	250	300	300	-	300	300	300	300
HIN (M22-K...)	500	250	500	250	300	300	300	300	300	250	250
HIA (M22-K...)	500	250	500	250	300	300	300	300	300	250	250
HIN (M22-CK...)	250	250	250	250	300	300	300	250	250	250	250
HIA (M22-CK...)	250	250	250	250	300	300	300	250	250	250	250

¹⁾ For NZM2/3/4 breakers equipped with electronic PXR trip unit

Current limiting values

NZM1...-NA, NZM2...-NA, NZM3...-NA

Circuit-breaker part no.	Cont. Amps	Volts AC 60 Hz	Threshold current			Intermediate current			High interrupting capacity		
			Maximum			Maximum			Maximum		
			rms sym	Peak	I ² dt	rms sym	Peak	I ² dt	rms sym	Peak	I ² dt
	A	V	kA	kA	kA ² s	kA	kA	kA ² s	kA	kA	kA ² s
NZMB1-A.../AF...NA	125 A	240	8.125	9.5	0.22	22	15	0.34	35	18.5	0.41
		480	8.125	10	0.4	18	18	0.8	25	21	1.1
NZMN1-A.../AF...NA	125 A	240	8.125	9.5	0.22	50	21.5	0.48	85	27	0.6
		480	8.125	10	0.4	22	20	1	35	24.5	1.37
NZMB2-A.../AF...NA	250 A	240	16.25	14	0.47	22	14.5	0.48	35	16.5	0.49
		480	15	15.5	0.63	22	17.5	0.75	25	18.5	0.8
		600	10	13.9	0.5	14	15.9	0.72	18	17.4	0.8
NZMN2-A.../AF...NA	250 A	240	16.25	14	0.47	50	18	0.5	85	21	0.51
		480	16.25	16	0.65	22	17.5	0.75	35	21	0.9
		600	15	16.4	0.74	22	18.9	0.84	25	19.9	0.87
NZMN2-VE(F)-NA	250 A	240	16.25	13	0.35	50	18	0.38	85	20.5	0.4
		480	16.25	15.5	0.56	22	18	0.65	35	20.5	0.8
		600	15	15.3	0.67	22	19	0.8	25	20	0.85
NZMH2-A.../AF...NA	125 A	240	8.125	9	0.3	100	20	0.35	200	24	0.4
		480	8.125	9.5	0.35	65	23	0.85	150	33.5	1.3
		600	8.125	10	0.4	42	22.5	1.0	65	26	1.2
NZMH2-A... /AF...NA	250 A	240	16.25	14	0.47	100	22	0.52	150	25	0.53
		480	16.25	16	0.65	65	28	1.14	100	36	1.28
		600	16.25	16.9	0.77	30	21.4	0.94	50	26.4	1.12
NZMH2-VE.../VEF...NA	250 A	240	16.25	13	0.35	100	21.5	0.41	150	24	0.43
		480	16.25	15.5	0.56	65	25.5	0.98	100	30	1.1
		600	16.25	16	0.7	30	21.5	0.91	50	26	1
NZMN3-VE...NA	600 A	240	39	28	1.2	65	31.5	1.35	85	33.5	1.45
		480	25	29	2.1	30	32	2.3	42	36	2.6
		600	20	27	2	30	34	2.7	35	36.5	3
NZMH3-VE...NA	600 A	240	39	28	1.2	100	35	1.5	150	40	1.6
		480	39	35	2.55	65	42	3	100	48	3.5
		600	30	34	2.7	42	39.5	3.25	50	43.5	3.5