TECHNICAL NOTICE SMRA

SMRA-* MODULE

NTRE-0325

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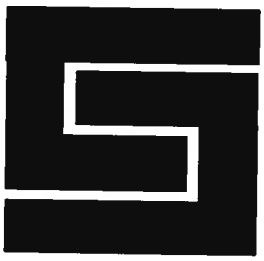

TECHNICAL NOTICE

ALL OR NOTHING

AUXILIARY RELAYS

SMRA

NTRE-325
Rev. 0

Snemo ltée/Ltd, 3605 Isabelle, Brossard (Québec), Canada, J4Y 2R2
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Snemo Ltée/Ltd

ERRATA

From : Yvan Pinard
Date : 98-04-16
Object : Technical data, all or nothing auxiliary relays
Reference : NTRE-325 rev0: SMRA NTRE-322 rev0 : SMRS

NOTICE: Auxiliary relay technical data :

Please take note that timing data shown below replace timing data included on page #3 of FCRE-122 (All-or-Nothing auxiliary relays SMRX-SMRS-SMRA-SMRH).

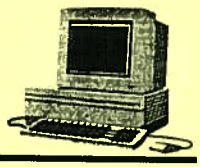
We modified timing values, because contact bouncing, is now included in measurment

RESPONSE TIME (RELAY 1241 : SMRA)

	TYPICAL	*MIN*	*MAX*
PICKUP TIME			
CLOSE NO CONTACT	10 ms	7 ms	13 ms
OPEN NC CONTACT	8 ms	4 ms	10 ms
DROPOUT TIME (without diode)			
OPEN NO CONTACT	3 ms	1 ms	5 ms
CLOSE NC CONTACT	8 ms	3 ms	15 ms
DROPOUT TIME (with diode)			
OPEN NO CONTACT	11 ms	5 ms	22 ms
CLOSE NC CONTACT	15 ms	8 ms	24 ms

RESPONSE TIME (SMRS: Standard version)

	TYPICAL	*MIN*	*MAX*
PICKUP TIME			
CLOSE NO CONTACT	11 ms	6 ms	13 ms
OPEN NC CONTACT	7 ms	6 ms	13 ms
DROPOUT TIME (without diode)			
OPEN NO CONTACT	4 ms	1 ms	8 ms
CLOSE NC CONTACT	7 ms	1 ms	8 ms
DROPOUT TIME (with diode)			
OPEN NO CONTACT	9 ms	1 ms	28 ms
CLOSE NC CONTACT	11 ms	1 ms	30 ms



RESPONSE TIME (SMRS: <10msec version)

	TYPICAL	*MIN*	*MAX*
PICKUP TIME			
CLOSE NO CONTACT	8.5 ms	7 ms	10 ms
OPEN NC CONTACT	5 ms	2.5 ms	7 ms
DROPOUT TIME			
OPEN NO CONTACT	13 ms	10 ms	15 ms
CLOSE NC CONTACT	20 ms	15 ms	25 ms

RESPONSE TIME (SMRH: Standard version)

	TYPICAL	*MIN*	*MAX*
PICKUP TIME			
CLOSE NO CONTACT	16 ms	10 ms	30 ms
OPEN NC CONTACT	10 ms	6 ms	20 ms
DROPOUT TIME (without diode)			
OPEN NO CONTACT	8 ms	4 ms	10 ms
CLOSE NC CONTACT	5 ms	8 ms	20 ms
DROPOUT TIME (with diode)			
OPEN NO CONTACT	40 ms	6 ms	58 ms
CLOSE NC CONTACT	45 ms	8 ms	60 ms

RESPONSE TIME (SMRH: High speed version)

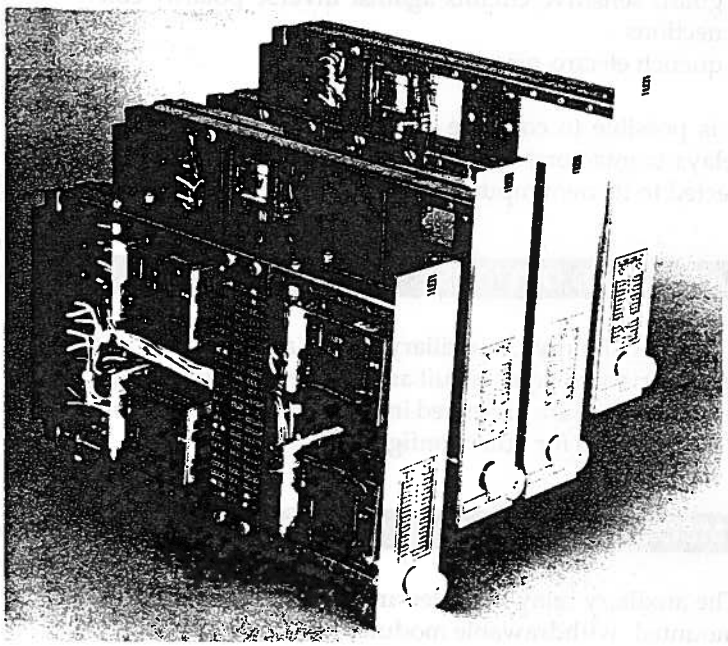
	TYPICAL	*MIN*	*MAX*
PICKUP TIME			
CLOSE NO CONTACT	10 ms	8 ms	20 ms
OPEN NC CONTACT	6 ms	4 ms	12 ms
DROPOUT TIME			
OPEN NO CONTACT	5 ms	2 ms	10 ms
CLOSE NC CONTACT	3 ms	8 ms	20 ms

Snemo Ltd.

All-or-Nothing Auxiliary Relays
SMRX-SMRS-SMRA-SMRH

FCRE - 122
04/91

APPLICATION



The SMR* family of all-or-nothing self-reset auxiliary relay modules was developed to satisfy the needs for:

- all voltage class applications within electrical power networks and industrial plants;
- auxiliary relays within electrical power plants, transmission, sub-transmission and distribution sub-stations;
- manual and automatic control of power devices such as circuit-breakers (tripping, closing and reclosing);
- logic schemes based on auxiliary relay use
- contact multiplication;
- galvanic isolation between electrical environments;
- interfacing relays for contact duty increase;
- auxiliary relays where high speed, contact duty, security and dependability (reliability) characteristics are required;
- auxiliary relays for use with protection relays of all manufacturers;
- auxiliary relays where a low cost, compact and flexible design is required.

MAIN FEATURES AND ADVANTAGES

Low cost solution compared to conventional electromechanical auxiliary relays.

Each auxiliary relay module is of compact design and can be packaged with other functions in an industry standard 19 inch rack. A space saving of approximately 30 percent is achieved over other rack mounted auxiliary relays.

Each module can accommodate one or more relays of same or different type.

User-defined module configurations, contact arrangements and coil ratings.

Field proven auxiliary relays (contactors) are used with many outstanding characteristics.

Easy access to auxiliary relays for maintenance or replacement; plug-in mounting in some cases.

Contact arrangement and module terminal identification silk screened on module front-plate.

Keyed pin interlock prevents inserting module in wrong rack location.

Above industry standard contact interrupting capability available in relays with arc quenching circuitry.

MAIN COMPONENTS

The auxiliary relay modules consist of auxiliary relays (contactors), ancillary components such as resistors, capacitors and diodes and in some cases front panel mounted LED targets. These components are housed within standard VERSA$_{®}$ modules, using a variety of mounting facilities.

ELECTRICAL DESIGN

The auxiliary relay modules types SMR* offer one or more (up to a maximum of eight) input circuits. Each of the input circuits feeds one or more auxiliary relay (contactor) coils, depending on the relay type and required contact arrangement. These coils are series or parallel connected, depending on the relay type.

The coils are voltage actuated, with field weakening resistors used in some cases for coil rating matching to the station battery rating. The different auxiliary relay modules differ with respect to number and duty of contacts, input circuit consumption, operating times, and number of contacts per coil.

Due to a limitation of the number of terminals on the plug-in connector of the module, all contacts of an auxiliary relay (contactor) may not be wired out to the module terminals.

Resistors, diodes and capacitors are used, as required, to:

- match coil ratings to input supplies
- increase the operating range
- accelerate pick-up times
- delay fall back
- suppress surges
- guard sensitive circuits against inverse polarity connections
- quench electro-magnetic arcs

It is possible to combine 2 different types of auxiliary relays (contactors) in a single module, each type connected to its own input circuit.

AVAILABLE OPTIONS

The SMR* family of auxiliary relays are available in a large variety of input circuit and output contact configurations. These are presented in the Selection Table below. Please inquire for other configurations not shown.

MECHANICAL DESIGN

The auxiliary relay modules are single seat width, front mounted, withdrawable modules.

The modules are designed for housing in a 2, 4, 6, 8 or 10 seat (19 inch) rack, type VERSA®. The module construction and dimensions are as described in the pamphlet on the VERSA® system (see Related Documents).

One or two voltage connectors, as required, are mounted on the module. Unique key interlocks for each module type and arrangements are also factory installed. Wiring between the module electrical components and the rear mounted connector(s) is 20 AWG.

Additionally required module components such as resistors, capacitors and diodes are mounted on epoxy glass PCB's with or without solder cover, as required, and Torx screw secured. The auxiliary relays (contactors) within the module, where not already in integral plastic housings, can be furnished with or without non-combustible dustcovers.

Mounting of the individual contactors is accomplished with a view to achieve maximum mechanical strength, vibration resistance, accessibility and wiring and replacement ease. For mechanical strength a 1.2 mm solid aluminum strip, Torx screw secured, stabilizes the upper and lower frame rails.

Mounting of the individual contactors is standardized

SELECTION TABLE

Nº INPUT CIRCUITS PER MODULE	Nº CONTACTORS PER INPUT CIRCUIT	Nº CONTACTS PER INPUT CIRCUIT			DIODE CIRCUITS	CONFIGURATION DESIGNATION	TYPES AVAILABLE (•)			
		NORMALLY OPEN	NORMALLY CLOSED	SWITCH OVER CCTS			SMRX	SMRS	SMRA	SMRH
1	1			4		A	•	•	•	•
	2	8			8	HS				•
				8		B	•	•	•	•
	3			10		C	•		•	
		4		8		D	•		•	
	4	16				E	•		•	
		12	4			E1	•		•	
		8	8			E2	•		•	
2	1			4		F	•	•	•	•
	2	3		3		G	•	•	•	
		8				H	•	•	•	•
		6	2			H1	•	•	•	•
		5	3			H2	•	•	•	•
		4	4			H3	•	•	•	•
		2	6			H7	•	•	•	•
1 type 1	2	8				H4		•		•
1 type 2		6	2							
1 type 1		8				H5		•		•
1 type 3		4	4							
1 type 2		6	2			H6		•		•
1 type 3		4	4							
3	1	3		1		J	•	•	•	•
4				2		K	•	•	•	
		2		1		K1		•	•	
6		2				L		•		
8		1				M		•		

T E C H N I C A L D A T A

			SMRX	SMRS	SMRA	SMRH
INPUT CIRCUITS	Nominal voltage rating U_{AN}	AC Volts (50, 60 Hz)	120			
		DC Volts	24, 48, 110, 125, 250			
	Operating range	(Performance characteristics maintained)	+ / - 15%	+ / - 15%	+ / - 15%	+ / - 15%
	Consumption (per coil)		DC(W) AC(VA)	DC(W) AC(VA)	DC(W) AC(VA)	DC(W) AC(VA)
		On pull-in (max.)	1.4 2	1.7 3.6	2.2 5.0	4.9 11.0
		Steady state (max.)	1.4 1.3	1.7 2.5	2.2 3.0	4.9 6
	Coil resistance	R_{AC} (Ω for U_{AN} = 120 V ac) at 20 ºC	5150	3000	2196	600
		R_{DC} (Ω for U_{AN} = 125 V dc) at 20 ºC	12350	9400	7700	4000
TIMING	Response time	(ms)	dc ac	dc ac	dc ac	dc ac
		Making (close on pull-in)	12 9	7 8	11 8	25 22
		Breaking (open on fall back)	8 5	4 15	8 7	17 16
		Breaking (open on pull-in)	5 6	7 15	3 14	8 11
		Making (close on fall back)	7 9	4 8	5 17	10 15
OUTPUT CIRCUITS	Making capacity	(Amperes for 200 ms)	20	20	30	30
	Continuous capacity	(A)	3	3	8	10 15 (<5 s)
	Interrupting capacity	(A)				
	NUMBER OF OPERATIONS		10^6	10^6	10^6	10^6 10
	Resistive load	At 120 V ac	3	3	3.8	9.5 15
		At 125 V dc	0.28	0.3	0.35	1 15
	Inductive load	At 120 V ac, cosØ = 0.5	3	3	2.5	7 15
		AT 125 V dc, L/R = 40 ms	0.23	1	0.2	0.3 8
EXTERNAL	Temperature	Performance characteristics maintained	-5 ºC to +40 ºC			
		Storage	-25 ºC to + 70 ºC			
	Vibrations	Periodic	IEC Class 55			
		Shock	15 g, 11 ms			
	Dielectric withstand	60 Hz, 1 min (at 40 ºC, 70%)	1500 V			
	Humidity		IEC 68.2.30			
	Enclosure protection		IEC IP 40. Dust protected			
MECHANICAL	Dimensions	Module	42 mm width (1.65") 177 mm height (7") 282 mm depth (11.13")			
	Maximum weight	Module	1.2 kg (2.65 lbs)			
	Durability	Number of operations	10^7	5 x 10^7	10^7	15 x 10^6
	Exterior finish	Front panel	Anodized aluminium; epoxy silk screened printing, thermo-plastic ink.			

and is executed in 4 different variants in accordance with the above mentioned requirements:

- racket mounted, Torx screw and stabilising sleeve secured;
- direct Torx screw secured, mounted on PCB;
- solder-pin directly mounted on PCB for smaller dimensioned contactors;
- plug-in socket mounted on U-shaped metal reinforcing brace for secure insertion and removal.

All auxiliary relays (contactors) are now also available for surface mounting applications. *Please refer to* ***Related Documents*** *for further details.*

RELATED DOCUMENTS

For more detailed information on related equipment, please refer to the following documents.

PRODUCT	DESIGNATION	REF #
SMR*	Auxiliary relays user manuals	NTRE - 127 to 130
VERSA®	Module housing rack	FCAP - 146
SMRB	Lock-out auxiliary relay (ANSI device 86)	FCRB - 108
SMTS	Solid-state time delay relay (ANSI device 2, 62)	FCTS - 102
SMTU	Microprocessor time delay relay (ANSI device 2, 62)	FCTU - 107
SMDS	Solid-state trip device (ANSI device 94)	FCDS - 104
SMDT	Solid-state time delayed trip device (ANSI device 62/94)	FCDT - 151
SRA*	Surface mount auxiliary relays	FCAG - 154
VERSATEST	Module extender	FCVT - 145

TEST

Routine tests are performed on all auxiliary relay modules before leaving the factory, including those by a computer controlled test bench developed by Snemo.

Individual test plans, pre-programmed for control of the test bench and test report generation are on file for all products sold. Automated functional tests include multiple operations of each relay, confirmation of contact change of state, pick-up and fall back times of each contact.

Dielectric withstand is verified for coil to contact, coil to ground and between contact insulation.

ORDERING CODE

Please complete the empty frames with choice (√) or data

SMR ☐ - ☐ - ☐

X, S, A or H
See technical data for type selection

X, S, A or H
Used only when a second different contactor type is desired in the same module

A to M
See Selection Table

Auxiliary voltage

DC ☐ 24 ☐ 48 ☐ 110 ☐

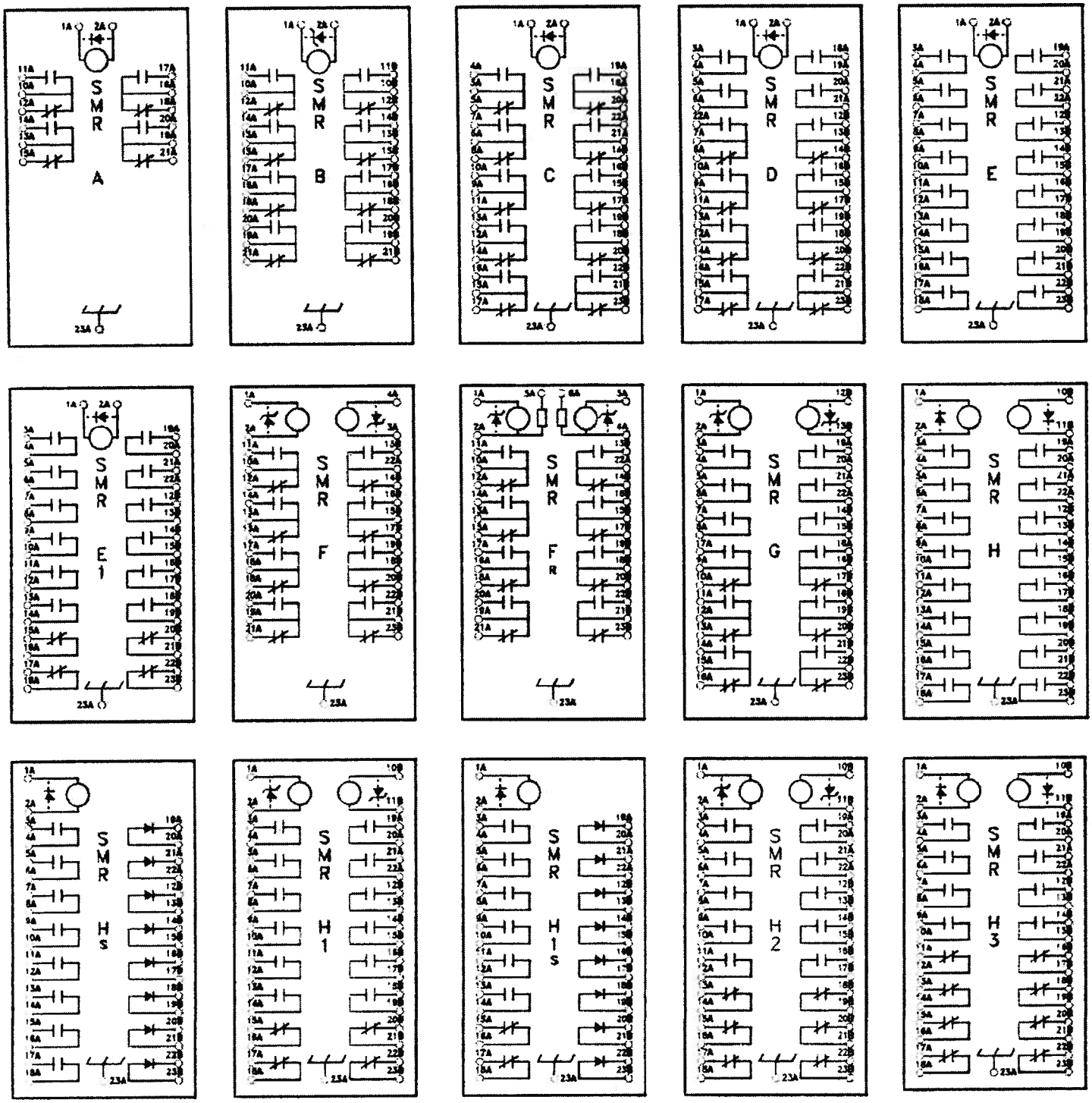
AC ☐ 120 ☐ 125 ☐ 250 ☐

Other ☐ ☐

All-or-Nothing Auxilary Relais

SMR Modules

Available option for SMRA, SMRH, SMRH High Speed version, SMRS2, and SMRX. Please contact us for confirmation.



All-or-Nothing Auxilary Relais
SMR Modules