Dansk Data Elektonik ApS

ID-7o23 Relay Module

for

the ID-7ooo Microprocessor System

February 1977

2859

1. GENERAL DESCRIPTION.

The ID-7023 module contains 16 reed relays for applications where a total electrical separation between microcomputer and process-equiptment is wanted. The relays are connected to two 8-bit registers on the module. In this way the relays may be activated or deactivated by loading these registers from the CPU. Two 8-bit switch-registers on the module determine whether a logic one in a register bit position should correspond to an activated relay in this position.

Fig. 1 shows a blocked schematic of the module. Appendix 1 contains the detailed logic schematic of the module.

2. PROGRAMMING.

The registers on the module are loaded by means of OUT-instructions performed by the CPU. The module occupies two of the 256 I/O-addresses. The base address of the module is determined by an 8-bit switch-register on the module. Executing an OUT-instruction using the even address, loads the register corresponding to relays 0-7. Using the odd address, the register corresponding to relays 8-15 is loaded.
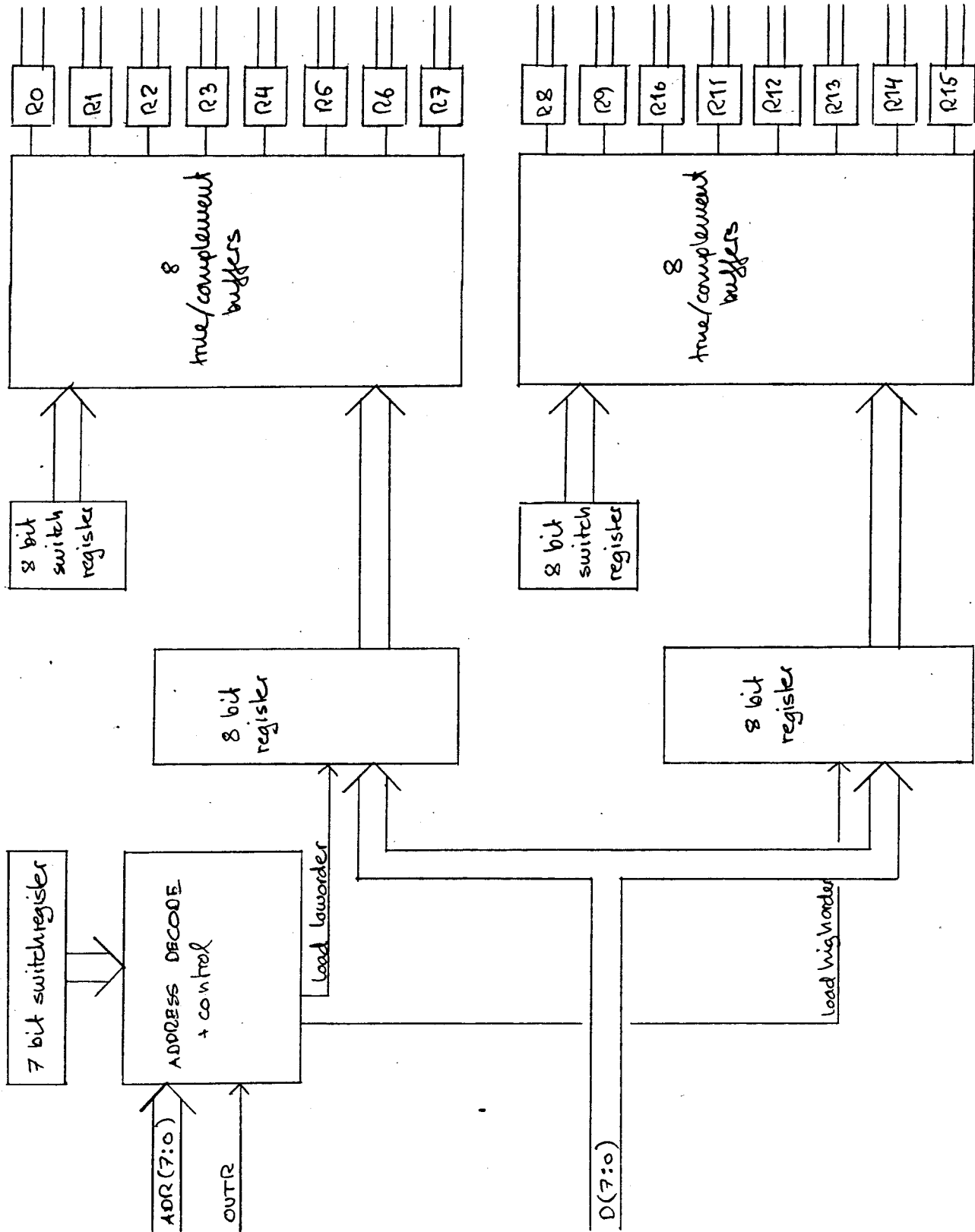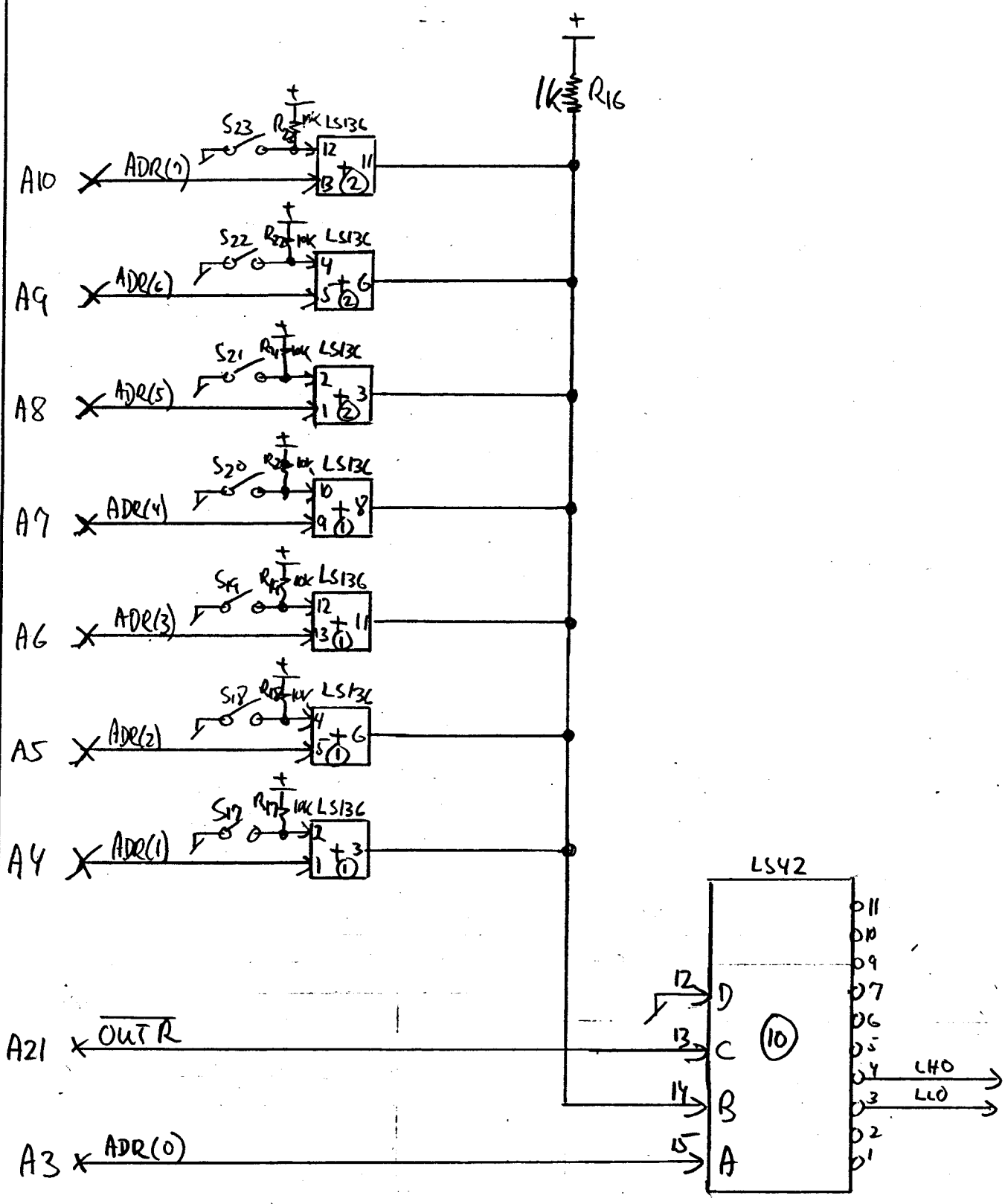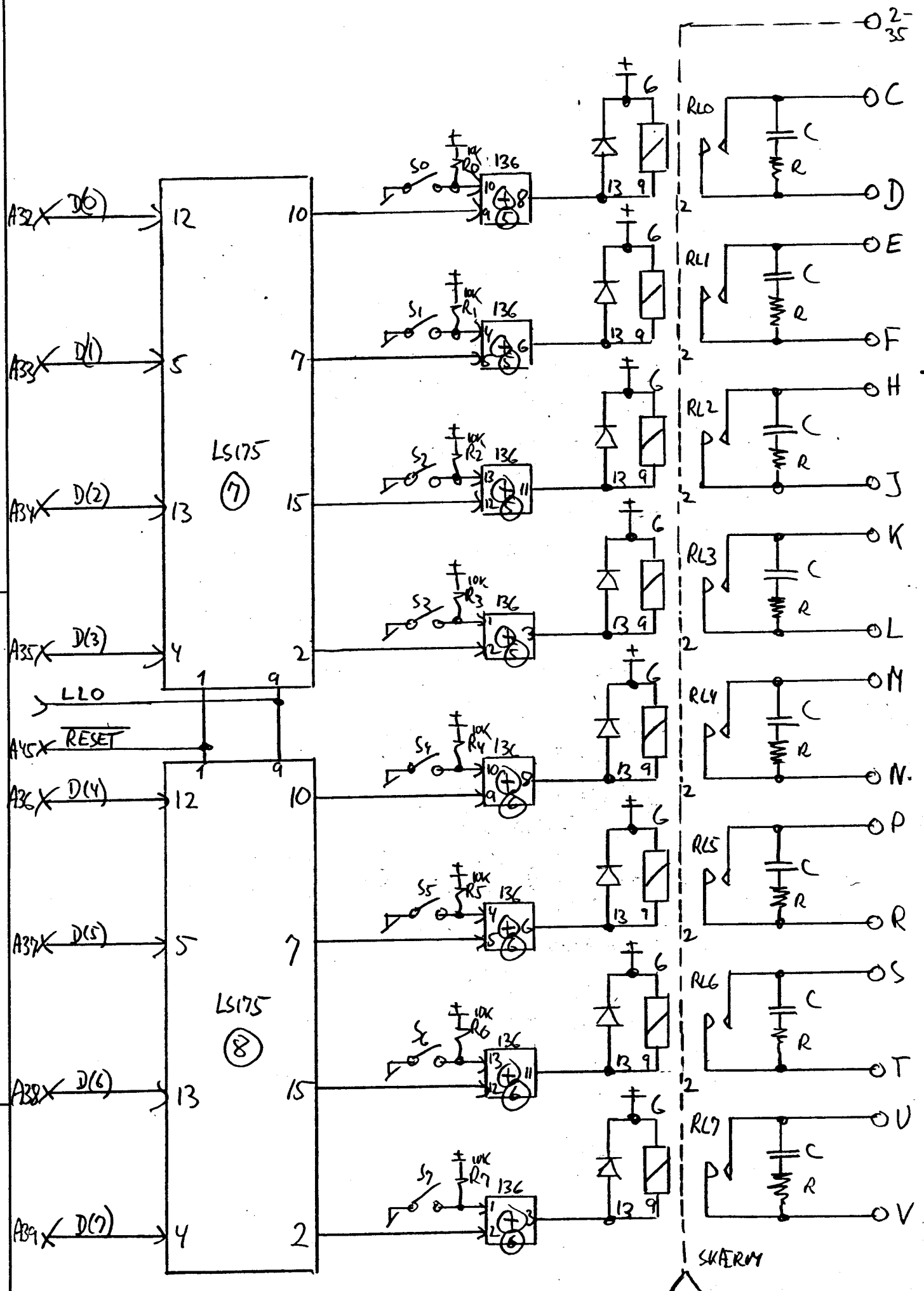
Fig. 1

3. ELECTRICAL CHARACTERISTICS.

The relayes on the module are CLARE PRME version A. Electrical data for these are given in appendix 2. The PC-board is prepared for mounting serial RC circuits in parallel with the contact sets.

The connections to the top connector are as follows:

Relay no.	Pin no.
0	C,D
1	E,F
2	H,J
3	K,L
4	M,N
5	P,R
6	S,T
7	U,V
8	W,X
9	Y,Z
10	a,b
11	c,d
12	e,f
13	h,j
14	k,l
15	m,n
Relay shield	B

$1K \gtrless R_{16}$

A10 ✗ ADR(7)   S23 $R_{2?}$ 10K LS136 12 11 13 (2)

A9 ✗ ADR(6)   S22 $R_{??}$ 10K LS136 4 6 5 (2)

A8 ✗ ADR(5)   S21 $R_{??}$ 10K LS136 2 3 1 (2)

A7 ✗ ADR(4)   S20 $R_{??}$ 10K LS136 10 8 9 (1)

A6 ✗ ADR(3)   S19 R_{18} 10K LS136 12 11 13 (1)

A5 ✗ ADR(2)   S18 $R_{1?}$ 10K LS136 4 6 5 (1)

A4 ✗ ADR(1)   S17 R_{17} 10K LS136 2 3 1 (1)

LS42

A21 ✗ $\overline{OUTR}$ 12 D   11 10 9 7

A21 13 C   (10)   6 5

14 B   4 LHO

A3 ✗ ADR(0)   15 A   3 LLO   2 1

2-35

LS175 ⑦

A32 — D(0) → 12 ... 10
A33 — D(1) → 5 ... 7
A34 — D(2) → 13 ... 15
A35 — D(3) → 4 ... 2

1 9
LLO
A45 — RESET
1 9

LS175 ⑧

A36 — D(4) → 12 ... 10
A37 — D(5) → 5 ... 7
A38 — D(6) → 13 ... 15
A39 — D(7) → 4 ... 2

S0 10K R0 136 10 8 9
S1 10K R1 136 4 6 5
S2 10K R2 136 13 11 12
S3 10K R3 136 1 3 2
S4 10K R4 136 10 8 9
S5 10K R5 136 4 6 5
S6 10K R6 136 13 11 12
S7 10K R7 136 1 3 2

+6 13 9 2

RL0 C R O C / O D
RL1 C R O E / O F
RL2 C R O H / O J
RL3 C R O K / O L
RL4 C R O M / O N
RL5 C R O P / O R
RL6 C R O S / O T
RL7 C R O U / O V

SKÆRM

SKÆRM

D(0) → 12   LS175 (15)   10
D(1) → 5   7
D(2) → 13   15
D(3) → 4   2
1   9

LHO
RESET
A45

D(4) → 12   LS175 (16)   10
D(5) → 5   7
D(6) → 13   15
D(7) → 4   2
1   9

S8 10K R_8 136   10 (+) 8 9 (13)
S9 10K R_9 136   4 (+) 6 5 (13)
S10 10K R_{10} 136   13 (+) 11 2 (13)
S11 10K R_{11} 136   1 (+) 3 2 (13)
S12 10K R_{12} 136   10 (+) 8 9 (14)
S13 10K R_{13} 136   4 (+) 6 5 (14)
S14 10K R_{14} 136   13 (+) 11 2 (14)
S15 10K R_{15} 136   1 (+) 3 2 (14)

RL8 6 13 9 2   1 C R 7   — W / X
RL9 6 13 9 2   1 C R 7   — Y / Z
RL10 C 13 9 2   1 C R 7   — a / b
RL11 C 13 9 2   1 C R 7   — c / d
RL12 6 13 9 2   1 C R 7   — e / f
RL13 6 13 9 2   1 C R 7   — h / j
RL14 6 13 9 2   1 C R 7   — k / l
RL15 6 13 9 2   1 C R 7   — m / n

2-35

CLARE

PRME SERIES

Sealed Contact Reed Relays

The PRME Picoreed relay features typical response times of 500 microseconds, signal level to 10 VA switching capabilities, total input/output isolation, epoxy moulded construction and an IC compatible TO-116 dual-in-line package. Traditional Clare reliability gives 100×10^6 operations at signal-level loads or 5×10^6 operations at the rated load.

The PRME relay can be driven directly from many DTL/TTL IC's. The coil draws only 13 milliamperes from standard 5 Volts logic supplies.
Low contact noise and low thermal emf characteristics make the PRME ideal for electronic process control equipment and low level switching applications.

The PRME adapts to either automatic insertion equipment techniques for direct PCB mounting or to mount in standard 14 pin DIP sockets.

Standard part number	Contact form	Coil resistance ± 15 % (Ohms)	Must operate voltage (Vdc)	Must release voltage (Vdc)	Max. voltage (Vdc)	Nom. voltage (Vdc)
PRME 15005	1A	380	3.75	1	15	5
PRME 15002		530	8	2	18	12
PRME 15003		2000	16	4	32	24

All characteristics at 25 °C

Special requirements : (see electrical diagrams)
Add to the part number
A : Electrostatic shield between coil and capsule connected to pin 2
B : Diode between pins 6 and 9; cathode to pin 6
AB : Special requirements A + B

Example :
PRME 15005 with electrostatic shield will be numbered PRME 15005A

SPECIFICATIONS

CONTACT RATING (Resistive load)

Power	10 VA maximum
Voltage	100 Vdc or peak ac maximum
Current	0.5 A maximum
Carry load	1 A (not switched)

CONTACT FORM

1 form A

CONTACT RESISTANCE

200 milliohms maximum initially

LIFE EXPECTANCY

See graph

OPERATE TIME

See graph

DIELECTRIC STANDOFF

175 Vac, rms, 50 Hz or 250 Vdc across open contacts
350 Vac, rms, 50 Hz or 500 Vdc between coil and contacts
105 Vac, rms, 50 Hz or 150 Vdc between coil and shield

INSULATION RESISTANCE

10.000 Megohms

CAPACITANCE

Across open contacts	0.8 pF
Open contacts to coil	1.5 pF
Closed contacts to coil	3 pF

ENVIRONMENTAL

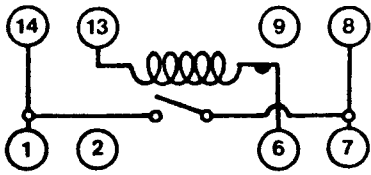|	
Vibration	0-5000 Hz, 20 g's (non operating)
Shock	100 g's, 11 ms, ½ sinewave (non operating)
Temperature	−40° to +105 °C (operating)

PHYSICAL

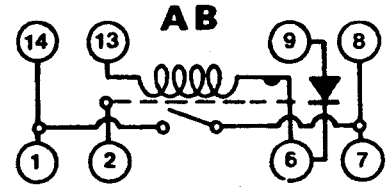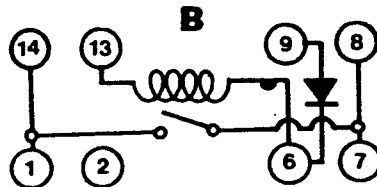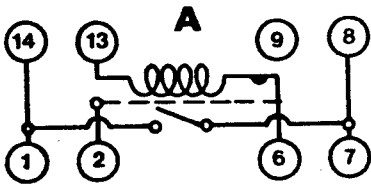|	
Mounting	any position
Cover	14 pin dual-in-line package, epoxy moulded, blue colour
Pins	tintillate tinned. Solder bath requirements : 5 seconds maximum at 260 °C
Contact	rhodium over gold

SUGGESTED HOLE SIZE IN PCB

0.6 mm (.024")

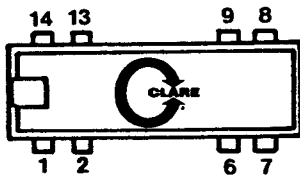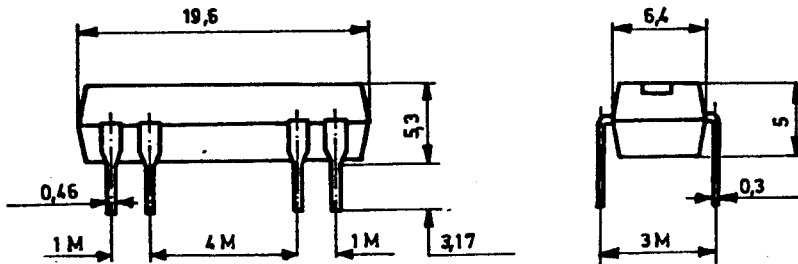## ELECTRICAL DIAGRAMS
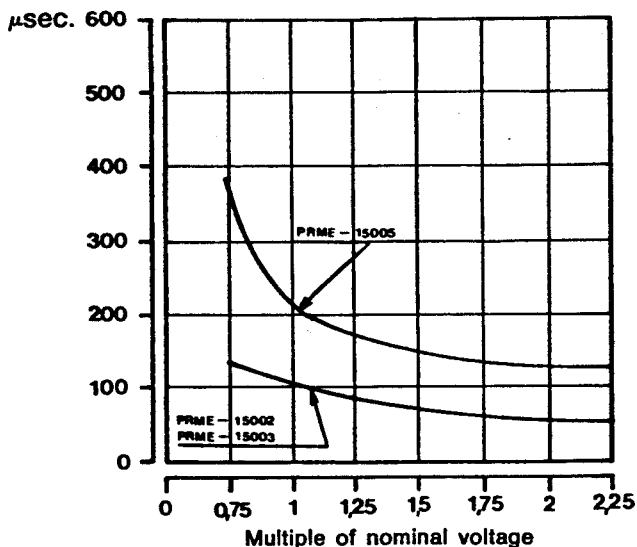
Top views
Standard

Special requirements

DIMENSIONS

In mm, M = 2.54 mm

OPERATE TIME
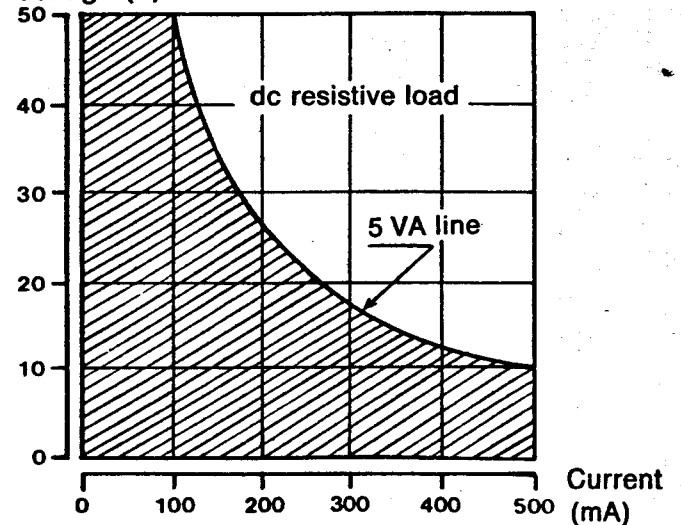
Time to first closure

Multiple of nominal voltage

Typical bounce time at nominal voltage :
PRME 15005 : 100 μsec.
PRME 15003 & PRME 15002 : 150 μsec.
Release time with diode at nominal voltage : 150 μsec.

LIFE EXPECTANCY

a) For loads at signal levels: 100 x 10⁶ operations

b) For loads within allowable range shown in graph above :
   10 x 10⁶ operations
c) For selected power load : 5 x 10⁶ operations at 360 mA,
   28 Vdc resistive

7