



SAFEMASTER
 Delay module,
 Release Delay
 BA 7924, IL 7824, IN 7824

Translation
 of the original instructions

0266527



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SAFEMASTER Delay module, Release Delay BA 7924, IL 7824, IN 7824



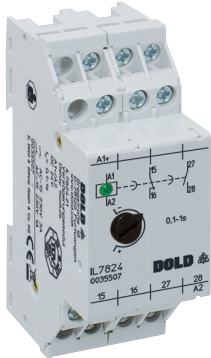
0221 537



BA 7924.21



BA 7924.21/002



IL 7824.21



IN 7824.21

- According to
 - Performance Level (PL) c and category 2 to EN ISO 13849-1
 - SIL Claimed Level (SIL CL) 2 to IEC/EN 62061
 - Safety Integrity Level (SIL) 2 to IEC/EN 61508
 - Category 2 to EN 954-1
- BA 7924.21/002 und BA 7924.21/003
 - Performance Level (PL) d and category 3 to EN ISO 13849-1
 - SIL Claimed Level (SIL CL) 2 nach IEC/EN 62061
 - Safety Integrity Level (SIL) 2 to IEC/EN 61508
 - Category 3 to EN 954-1
- Release delay
- Without auxiliary voltage
- Output: 1 NC, 1 NO contacts, forcibly guided
- Operating state display
- Optionally with adjustable or fixed time delay up to 30 s
- Optionally with redundant timing circuit
- Optionally with 1 or 2 separate timing circuits
- Optionally also in housing for distribution board
- Width 45 mm, 35 mm or 52.5 mm

Approvals and Markings

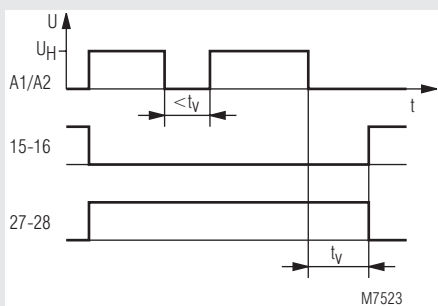


* see variants

Application

- Delayed disconnection with testable switching status of output relays.

Function Diagram



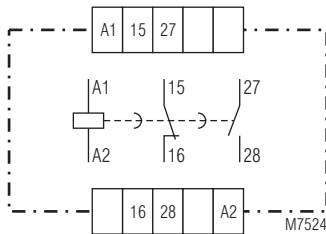
Indicators

LED's comes on when A1 / A2 connected to supply

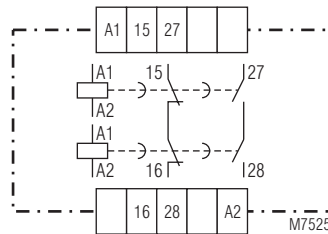
Notes

The output contacts of the two timing circuits are connected in series in the BA 7924.21/002 and /003 modules. This results in so-called switch-off redundancy, i.e. the contact path 27-28 is opened reliably after expiry of the predefined delay time, even if a contact in this path is welded.

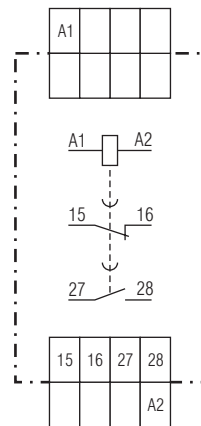
Circuit Diagrams



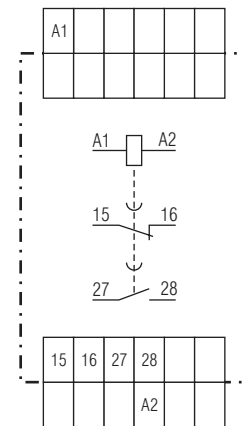
BA 7924.21
BA 7924.21/100



BA 7924.21/002
BA 7924.21/003



IL 7824.21



IN 7824.21

Technical Data

Time delay t_v

| | |
|------------------------------|--|
| BA 7924.21: | 0.1 ... 1 s; 0.3 ... 3 s; 0.5 ... 5 s; 1 ... 10 s; 3 ... 30 s |
| BA 7924.21/001: | 1 s; 3 s; 5 s; 10 s; 30 s fixed |
| BA 7924.21/002: | 5 s; 10 s fixed |
| BA 7924.21/003: | 0.5 ... 5 s; 1 ... 10 s |
| IL 7824.21: | 0.1 ... 1 s; 0.3 ... 3 s |
| IL 7824.21/100: | 0.5 s; 1 s; 3 s fixed |
| IN 7824.21: | 0.5 ... 5 s; 1 ... 10 s |
| IN 7824.21/100: | 5 s; 10 s fixed |
| Repeat accuracy: | ± 15 % of set value |
| Minimum closing time: | 50 % of full scale value |

Input

| | |
|--|---|
| Nominal voltage U_N: | DC 24 V AC 230 V (only BA 7924.21 and BA 7924.21/001) |
|--|---|

Voltage range:

| | |
|--------------------------|----------------------|
| at 10 % residual ripple: | AC 0.8 ... 1.1 U_N |
| at 48 % residual ripple: | DC 0.9 ... 1.2 U_N |

Nominal consumption:

| | |
|--|-----------------|
| at BA 7924.21/002 and BA 7924.21/003: | 0.85 W / 4.5 VA |
|--|-----------------|

| | |
|---------------------------|---------------------|
| Nominal frequency: | 1.7 W 50 / 60 Hz |
|---------------------------|---------------------|

Output

Contacts

| | |
|---|----------------------------------|
| BA 7924.21: | 1 NC, 1 NO contacts |
| IL/IN 7824.21: | 1 NC, 1 NO contacts |
| Contact type: | Relay, forcibly guided |
| Release delay typ. bei U_N: | 10 ms + t_v |
| Nominal output voltage: | AC 10 ... 250 V, DC 10 ... 110 V |
| Thermal current I_{th}: | Max. 8 A |
| Switching capacity to AC 15 | |
| for NO contact: | 3 A / AC 230 V IEC/EN 60947-5-1 |
| for NC contact to AC 13 | 1 A / AC 230 V IEC/EN 60947-5-1 |
| for NO contact: | 2 A / DC 24 V IEC/EN 60947-5-1 |
| for NC contact to DC 13: | 2 A / DC 24 V IEC/EN 60947-5-1 |
| for NO contact: | 4 A / DC 24 V at 0.1 Hz |
| for NC contact: | 3 A / DC 24 V at 0.1 Hz |

Electrical life

6 A, AC 230 V $\cos \varphi = 1$:

Permissible operating frequency:

> 2×10^5 switching cycles
Max. 2000 switching cycles / h
but please note minimum closing time

Short circuit strength

max. fuse rating: 6 A gG / gL IEC/EN 60947-5-1

Mechanical life:

50×10^6 switching cycles

General Data

| | |
|---|--|
| Operating mode: | Continuous operation |
| Temperature range | |
| Operation: | - 20 ... + 60 °C |
| Storage: | - 40 ... + 60 °C |
| Altitude: | ≤ 2000 m |
| Clearance and creepage distances | |
| rated impuls voltage / pollution degree: | 4 kV / 2 IEC 60664-1 |
| EMC | |
| Interference suppression: | Limit value class B EN 55011 |
| Degree of protection | |
| Housing: | IP 40 IEC/EN 60529 |
| Terminal plate: | IP 20 IEC/EN 60529 |
| Housing: | Thermoplastic with V0 behaviour according to UL subject 94 |
| Vibration resistance: | Amplitude 0.35 mm, IEC/EN 60068-2-6 frequency 10 ... 55 Hz |
| Climate resistance: | 20 / 060 / 04 IEC/EN 60068-1 |
| Terminal arrangement at BA 7924: | DIN 46199-5 |
| Terminal designation: | EN 50005 |
| Wire fixing: | Flat terminals with self-lifting clamping piece IEC/EN 60999-1 DIN rail IEC/EN 60715 |
| Mounting: | |
| Weight: | |
| BA 7924 DC / AC: | 200 g / 350 g |
| IL 7824 / IN 7824: | 120 g / 150 g |

Dimensions

| | |
|-------------------------------|-------------------|
| Width x height x depth | |
| BA 7924: | 45 x 74 x 133 mm |
| IL 7824: | 35 x 89 x 58 mm |
| IN 7824: | 52.5 x 89 x 58 mm |

CCC-Data

Nominal voltage U_N :

| | |
|----------|------------------|
| BA 7924: | DC 24 V, AC 230V |
|----------|------------------|

Thermal current I_{th} :

Max. 5 A

Switching capacity

| | | |
|-------------|----------------|------------------|
| to AC 15 | | |
| NO contact: | 2 A / AC 230 V | IEC/EN 60947-5-1 |
| to DC 13 | | |
| NO contact: | 1 A / DC 24 V | IEC/EN 60947-5-1 |
| NC contact: | 1 A / DC 24 V | IEC/EN 60947-5-1 |



Technical data that is not stated in the CCC-Data, can be found in the technical data section.

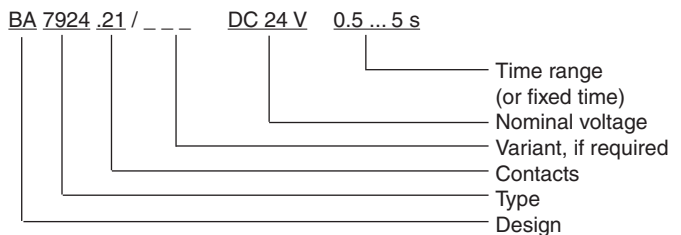
Standard Type

| | |
|--------------------------------|------------------------------|
| BA 7924.21 DC 24 V 0.3 ... 3 s | |
| Article number: | 0039707 |
| • Output: | 1 NO contact 1 NC contact |
| • Nominal voltage U_N : | DC 24 V |
| • Time range: | 0.3 ... 3 s |
| • Width: | 45 mm |

Variants

| | |
|--|---|
| BA 7924.21/61: | With UL approval (Canada/USA) |
| BA 7924.21: | 1 timing circuit, adjustable time |
| BA 7924.21/001: | 1 timing circuit, fixed time |
| BA 7924.21/002: | 2 timing circuit, fixed time |
| BA 7924.21/003: | 2 timing circuit, adjustable time |
| Delay modules in housing for distribution board: | |
| IL 7824.21: | 1 timing circuit, adjustable time delay, 35 mm wide |
| IN 7824.21: | 1 timing circuit, adjustable time delay, 55 mm wide |
| IL 7824.21/100: | 1 timing circuit, fixed time delay, 35 mm wide |
| IN 7824.21/100: | 1 timing circuit, fixed time delay, 55 mm wide |

Ordering example for variants



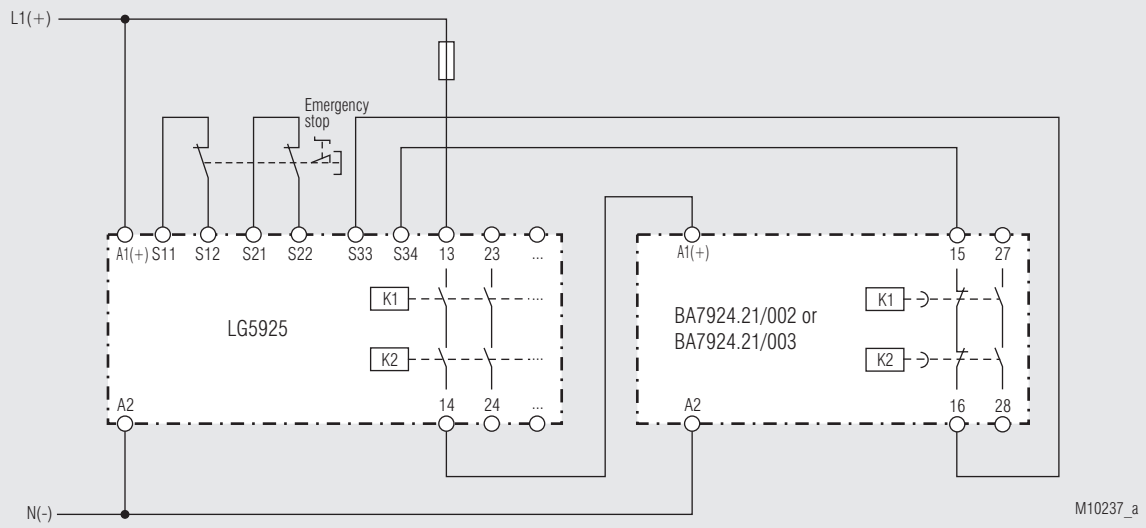
Troubleshooting

| Failure | Potential cause |
|----------------------------|--|
| Device cannot be activated | - Power supply not connected - Unit defective |

Maintenance and repairs

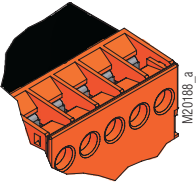
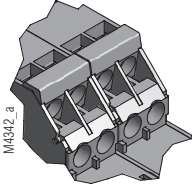
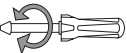
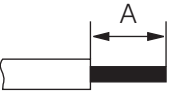
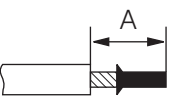
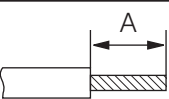
- The device contains no parts that require maintenance.
- In case of failure, do not open the device but send it to manufacturer for repair.

Application Example

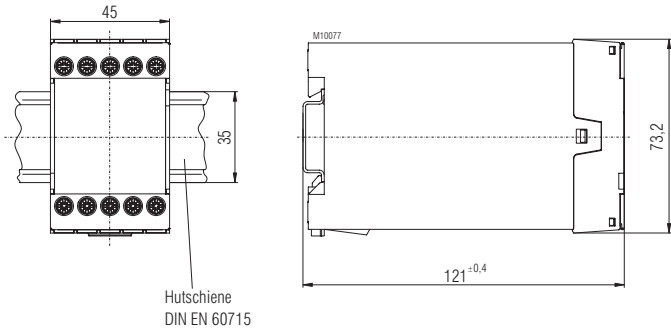


LG 5925 with BA 7924.21/002 e.g. BA 7924.21/003, suitable up to SIL 3, Performance Level e; Cat. 3

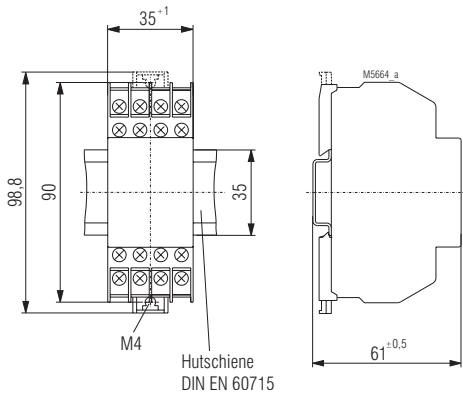
| | |
|----|--------------------------|
| DE | Anschlussstechnik |
| EN | Connection Technology |
| FR | Technologie de connexion |

| | Schraubklemmen, nicht abnehmbar Screw terminals, fixed Bornes à vis, fixes | Schraubklemmen, nicht abnehmbar Screw terminals, fixed Bornes à vis, fixes |
|--|--|--|
| |  |  |
|  | <p>ø 4 mm / PZ 1 0,8 Nm 7 LB. IN</p> | <p>ø 4 mm / PZ 1 0,8 Nm 7 LB. IN</p> |
|  | <p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> | <p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> |
|  | <p>A = 10 mm 1 x 0,5 ... 2,5 mm² 1 x AWG 20 to 14 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> | <p>A = 10 mm 1 x 0,5 ... 2,5 mm² 1 x AWG 20 to 14 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> |
|  | <p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> | <p>A = 10 mm 1 x 0,5 ... 4 mm² 1 x AWG 20 to 12 2 x 0,5 ... 1,5 mm² 2 x AWG 20 to 16</p> |

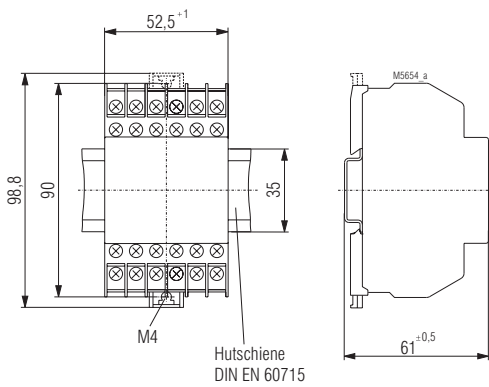
| | |
|----|-------------------------------|
| DE | Maßbilder (Maße in mm) |
| EN | Dimensions (dimensions in mm) |
| FR | Dimensions (dimensions en mm) |



BA 7924



IL 7924



IN 7924

| | |
|----|--|
| DE | Sicherheitstechnische Kenndaten BA7924.21 und /001 |
| EN | Safety related data BA7924.21 and /001 |
| FR | Données techniques sécuritaires BA7924.21 et /001 |

| | |
|----|---|
| DE | Sicherheitstechnische Kenndaten BA 7924.21/002 und /003 |
| EN | Safety related data BA 7924.21/002 and /003 |
| FR | Données techniques sécuritaires BA 7924.21/002 et /003 |

| | | |
|------------------------|-------|-----------------|
| EN ISO 13849-1: | | |
| Kategorie / Category: | 2 | |
| PL: | c | |
| MTTF _d : | 574,4 | a (year) |
| DC _{avg} : | 78,8 | % |
| d _{op} : | 365 | d/a (days/year) |
| h _{op} : | 24 | h/d (hours/day) |
| t _{cycle} : | 3600 | s/cycle |
| | ≥ 1 | /h (hour) |

| | | |
|------------------------|-------|-----------------|
| EN ISO 13849-1: | | |
| Kategorie / Category: | 3 | |
| PL: | d | |
| MTTF _d : | 582,1 | a (year) |
| DC _{avg} : | 79,9 | % |
| d _{op} : | 365 | d/a (days/year) |
| h _{op} : | 24 | h/d (hours/day) |
| t _{cycle} : | 3600 | s/cycle |
| | ≥ 1 | /h (hour) |

| | | |
|---|----------|--------------------------------|
| IEC/EN 62061 IEC/EN 61508 IEC/EN 61511: | | |
| SIL CL: | 2 | IEC/EN 62061 |
| SIL: | 2 | IEC/EN 61508 / IEC/EN 61511 |
| HFT ¹⁾ : | 0 | |
| DC: | 78,8 | % |
| PFH _D : | 4,21E-08 | h ⁻¹ |
| T _i : | 20 | a (year) |
| ¹⁾ HFT = Hardware-Fehlertoleranz Hardware failure tolerance Tolérance défauts Hardware | | |

| | | |
|---|----------|--------------------------------|
| IEC/EN 62061 IEC/EN 61508 IEC/EN 61511: | | |
| SIL CL: | 2 | IEC/EN 62061 |
| SIL: | 2 | IEC/EN 61508 / IEC/EN 61511 |
| HFT ¹⁾ : | 1 | |
| DC: | 79,9 | % |
| PFH _D : | 2,63E-09 | h ⁻¹ |
| T _i : | 20 | a (year) |
| ¹⁾ HFT = Hardware-Fehlertoleranz Hardware failure tolerance Tolérance défauts Hardware | | |



| | |
|----|---|
| DE | Die angeführten Kenndaten gelten für die Standardtype. Sicherheitstechnische Kenndaten für andere Geräteausführungen erhalten Sie auf Anfrage. Die sicherheitstechnischen Kenndaten der kompletten Anlage müssen vom Anwender bestimmt werden. |
| EN | The values stated above are valid for the standard type. Safety data for other variants are available on request. The safety relevant data of the complete system has to be determined by the manufacturer of the system. |
| FR | Les valeurs données sont valables pour les produits standards. Les valeurs techniques sécuritaires pour d'autres produits spéciaux sont disponibles sur simple demande. Les données techniques sécuritaires de l'installation complète doivent être définies par l'utilisateur. |

| | | |
|---|------------------------------|---|
| Anforderung seitens der Sicherheitsfunktion an das Gerät Demand to our device based on the evaluated necessary safety level of the application. Consigne résultant de la fonction sécuritaire de l'appareil | | Intervall für zyklische Überprüfung der Sicherheitsfunktion Intervall for cyclic test of the safety function Interval du contrôle cyclique de la fonction sécuritaire |
| nach, acc. to, selon EN ISO 13849-1 | PL d with Cat. 3 | einmal pro Jahr once per year annuel |
| nach, acc. to, selon IEC/EN 62061, IEC/EN 61508 | SIL CL 2, SIL 2 with HFT = 1 | einmal pro Jahr once per year annuel |