SERVING SAFETY

Mors Smitt Railway Technology

Railway relays

Mors Smitt
A Wabtec Company

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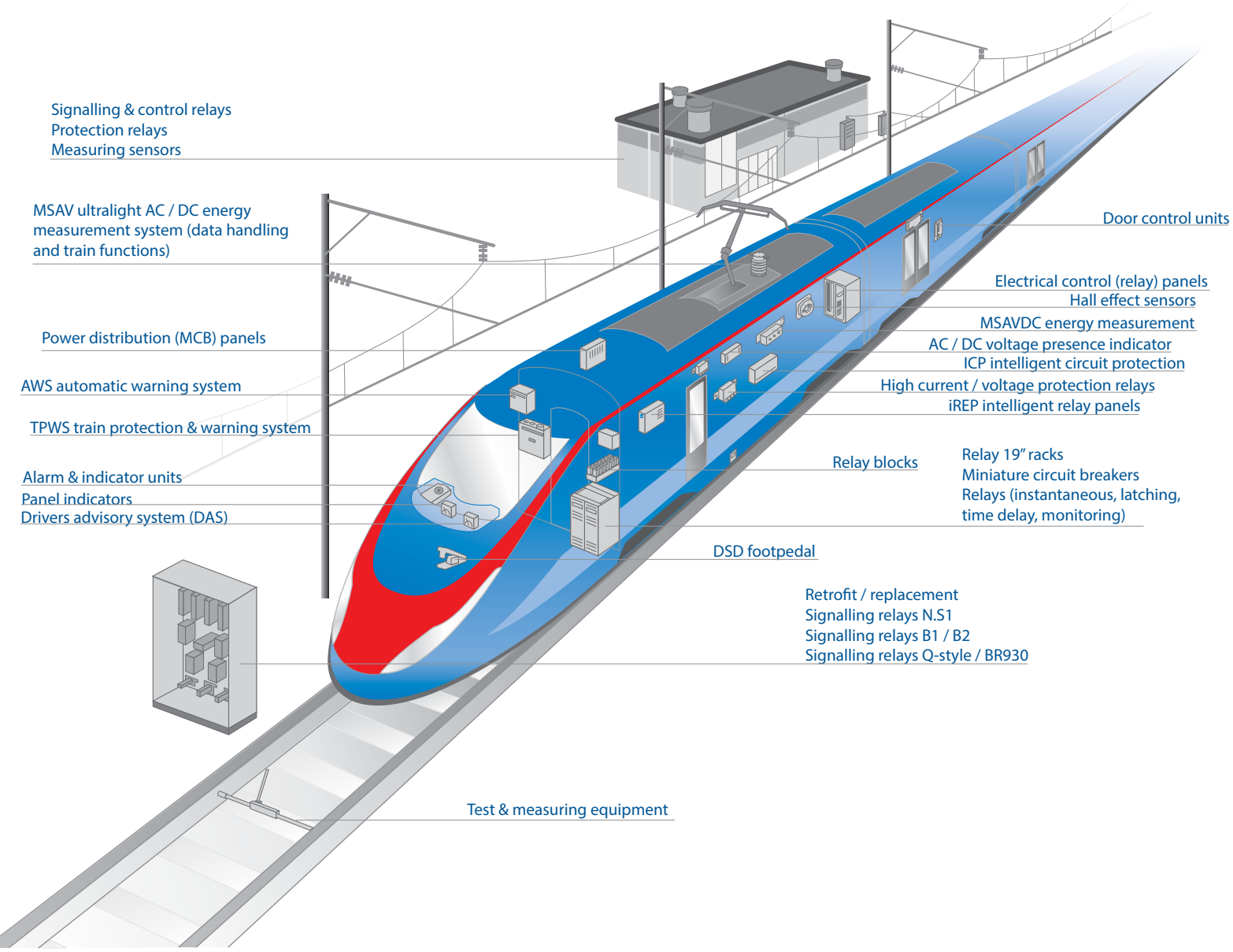


'Onboard & trackside railway components and solutions'

SERVING SAFETY

Mors Smitt Railway technology

Mors Smitt is entirely devoted to develop and manufacture electrical equipment, components and control solutions for railway and trackside applications. Mors Smitt has become leading in this demanding market. We supply the largest international rolling stock manufacturing enterprises as well as the main world rail operators.

Mors Smitt has been manufacturing relays since 1902. We have a wide range of relays fit for all railway rolling stock applications. Our technology was developed in the 1960's and has proven itself over time and is still the most reliable and economic solution for electrical control applications today. Innovation continues and Mors Smitt is a true relay specialist with hugh know-how of applications inside rolling stock.

Market characteristics

The railway world is characterized by a tough and uncompromising work environment. Constant shock & vibration, dust, temperature and humidity variations and electric disturbances demand components working under harsh conditions. This is the world in which Mors Smitt has invested best efforts, parts and components that work unquestioningly, offer a long effective life and result in low lifecycle cost.

Railway and quality standards

Our products are designed and compliant to the strictest railway directives, for example:

EN 50155	Electronic equipment used on rolling stock for railway applications
EN 50121	Electromagnetic compatibility for railway applications
IEC 60077	Electrical equipment for rolling stock in railway applications
IEC 60571	Electronic equipment used on railway vehicles
IEC 61373	Rolling stock equipment - Shock and vibration test
EN 45545-2	Railway rolling stock - Fire behaviour

Mors Smitt companies have certified quality and environmental management systems according the leading international standards, ISO 9001:2008, ISO 14001 and the railway specific IRIS standard.

Worlwide availability is assured by a network of professional, trained and dedicated subsidiaries, distributors and agents, offering local service and support. Mors Smitt not only has a clear eye directed at reliability, dependability, safety and cost-effectiveness, but also to the demands of our planet. Environmental consciousness is woven closely into design, manufacturing and commercial operations. The company is contributing to the safety of the world in more ways than one.

BUREAU VERITAS 1828

IRIS Certification

Mors Smitt continuously improves its products and services. Specifications are changed without prior notice. No rights can be derived from specifications in this brochure. Changes and printed errors reserved.

September 2015

New solutions are co-designed with railway operators and contractors, creating safer railway networks

General content

SERVING SAFETY

The Mors Smitt relay selection is divided in the following platforms:

Relay platforms

D-platform

Page 15

Compact multi functional relays for all different kind of applications. Up to 4 change-over contacts these relays all have the same base of 40 x 40 mm. 8-pole configurations in different types also available.

Instantaneous

Safety-critical
Weld-no-transfer
according EN 50205

Latching

Timer

1-shot

Flashing

Monitoring

8-pole configurations

A - / B-platform

Page 61

Heavy duty multi functional relays with very long mechanical contact life of 100 million cycles. Up to 4 change-over contacts these relays all have the same base of 45 x 45 mm. Different types available for many different applications. B-relays with higher continuous contact load and higher relay cover than A-relays.

Instantaneous

Latching

Timer

1-shot

Flashing

Monitoring

Relay platforms

CU-platform

Page 119

Small relays up to 2 change-over contacts. These relays all have the same base of 20 x 30 mm and different models are available for different applications.

Instantaneous

Latching

Monitoring

C-platform

Page 137

Flat multi functional relays up to 9 change-over contacts and very long mechanical contact life of 100 million cycles. These relays all have the same base of 33 x 65 mm. Different models are available for different applications.

Instantaneous

Latching

Flashing

Monitoring

Specials

Page 155

Relays with different functionalities and options for many different applications. Ranging from 1 to 40 change-over contacts in different dimensions.

Electronic timer modules

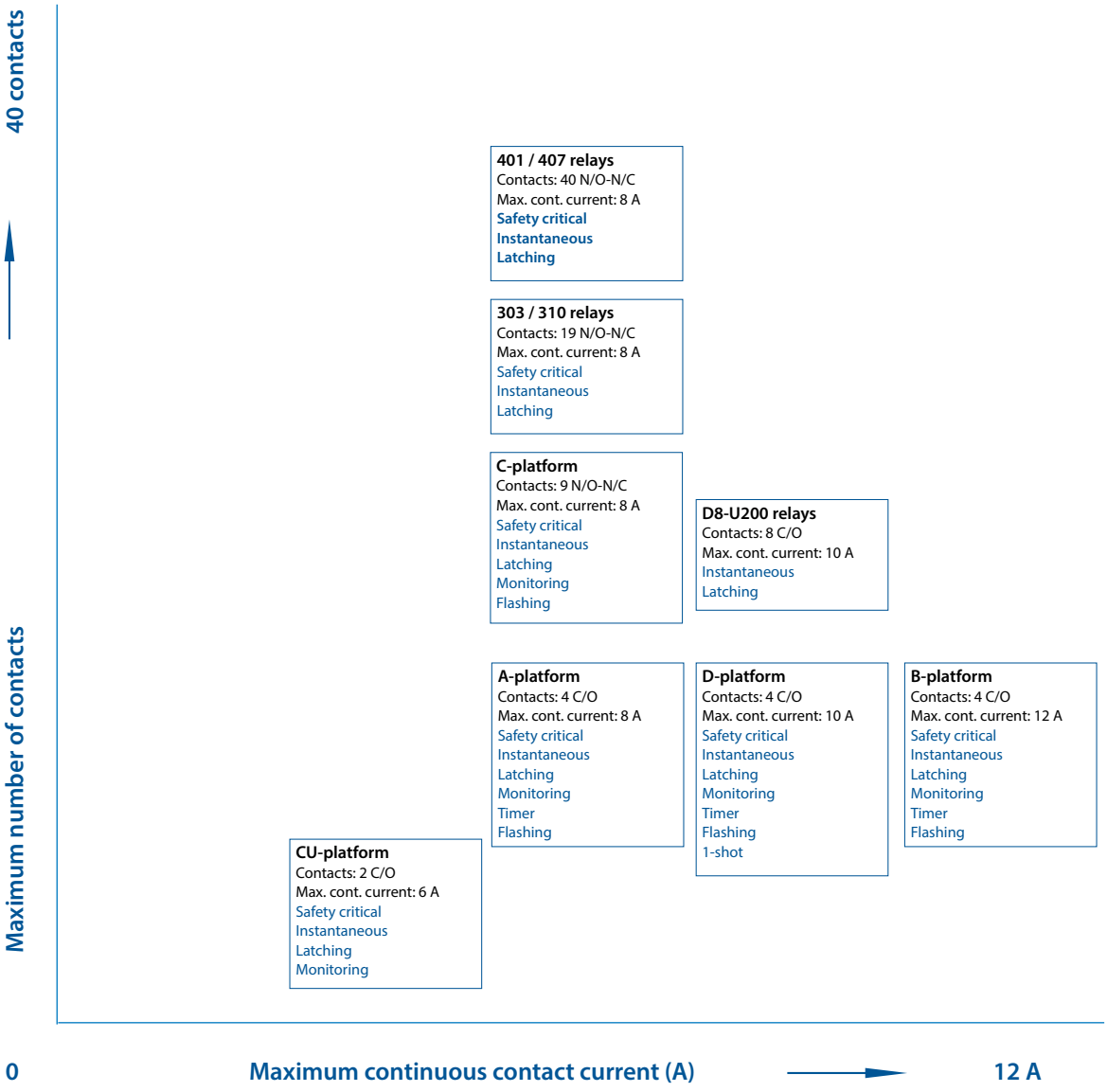
Page 175

Timer modules which converts instantaneous relay(s) to timer relay(s). The modules have the same base of 45 x 45 mm and different models are available for different applications.

Selection table

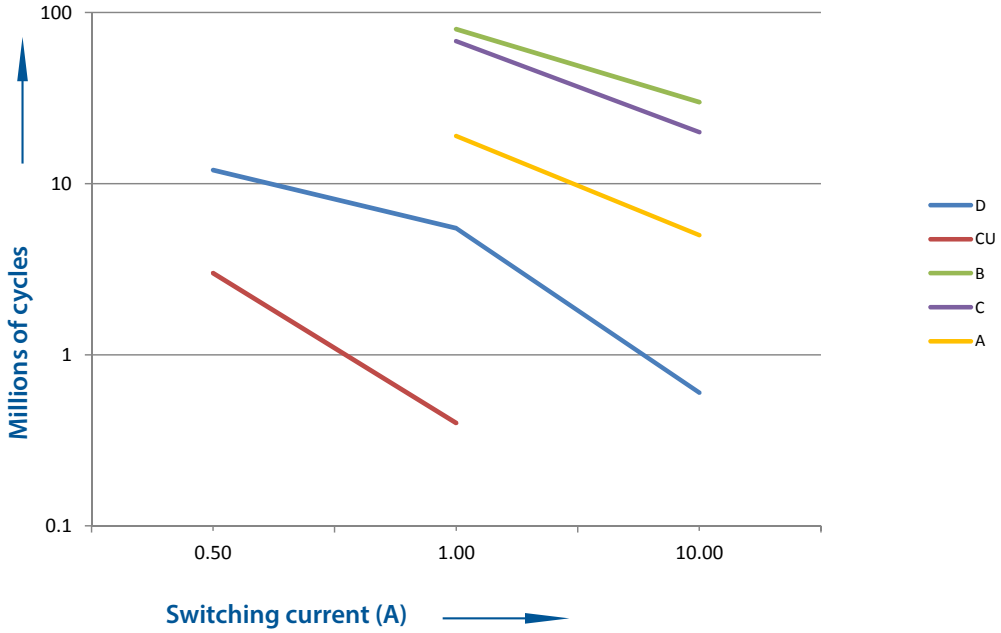
The details of each relay are described in the product pages in the next chapters.

A first distinction can be made with 2 graphs. The first graph shows different relay platforms with respect to the number of contacts and the maximum continuous contact current.



The second graph shows a comparison of different relay platforms with respect to their electrical life expectancy.

DC current breaking capacity (24 VDC resistive load)



Comparison chart of life expectancy different relay platforms (for details see life expectancy curves of each relay)

Selection table

Standard	•
Option	o
Not possible	-

Type	Platform	Contacts	Max. cont. current	Coil input	Weld-no-transfer contacts	$AgSnO_2$ contacts	Gold contacts	Gold bifurcated and silver contacts	Low operation voltage	Double make / double break	Magnetic arc blow-out	Current coil	LED indicator	Back EMF protection diode	Polarisation diode	Double zener coil protection diode (transil)	Make before break contacts	Special dust protection	Push-to-test button	Minimum temperature -40 °C	Minimum temperature -50 °C	Integrated snap-lock	Mechanical keying relay to socket	Manual reset control lever	Position indicator	Suitable for both DC and AC	Reversed polarity (+on 6 pin)	Page
Instantaneous																												
D-U200	D	4 C/O	10 A	DC	o	o	o	-	-	o	•	-	o	•	o	o	o	o	o	-	o	•	o	-	-	o	o	19
D-U200-W	D	4 N/O - N/C	10 A	DC	•	o	o	-	-	o	•	-	o	•	o	o	o	o	-	-	o	•	0	-	-	o	o	20
D-U300	D	4 C/O	10 A	AC	-	o	o	-	-	o	•	-	o	-	-	-	-	o	o	o	-	•	o	-	-	-	-	21
DGG-U200	D	2 C/O	10 A	DC	-	o	o	-	•	o	•	-	o	•	o	o	-	o	-	-	o	•	o	-	-	-	-	22
D8-U200	D	8 C/O	10 A	DC	-	o	o	-	-	o	•	-	o	•	o	o	-	o	-	-	o	•	o	-	-	o	-	23
A 400	A	A C/O	8 A	DC or AC	o	-	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	64
AG 400	A	4 C/O	5 A	DC or AC	o	-	•	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	65
AK 400	A	4 C/O	8 A	DC or AC	o	•	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	66
AM 400	A	4 C/O	8A	DC or AC	o	-	-	•	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	67
B 400	B	4 C/O	12 A	DC or AC	•	-	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	68
BG 400	B	4 C/O	5 A	DC or AC	o	-	•	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	69
BK 400	B	4 C/O	12 A	DC or AC	•	-	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	70
BM 400	B	4 C/O	12 A	DC or AC	o	-	-	•	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	71
CU/CP-U200-G	CU	2 C/O	6 A	DC	•	-	o	-	-	-	-	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	122
CU/CP-U300-G	CU	2 C/O	6 A	AC	•	-	o	-	-	-	-	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	123
CU/CP-U200-B	CU	2 C/O	8 A	DC	•	-	-	-	-	o	•	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	124
CU/CP-U200-D	CU	1 C/O + 1 N/O	6 A	DC	•	-	o	-	•	-	-	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	125
CU/CP-U200-U	CU	1 C/O	8 A	DC	-	-	o	-	-	•	-	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	126
CU/CP-U300-U	CU	1 C/O	8 A	AC	-	-	o	-	-	•	-	-	o	-	-	-	-	-	-	•	-	-	•	-	-	-	-	127
C	C	9 N/O - N/C	8 A	DC	•	-	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	-	-	140
CG	C	9 N/O - N/C	5 A	DC or AC	•	-	•	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	141
CK	C	9 N/O - N/C	8 A	DC or AC	•	•	-	-	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	o	-	142
CM	C	9 N/O - N/C	8 A	DC	•	-	-	•	-	•	-	-	o	o	-	o	-	-	-	•	-	-	•	-	-	-	-	143
Latching																												
BD-U200	D	3 C/O + 1 N/C	10 A	DC	-	o	o	-	-	o	•	-	-	o	o	-	-	o	-	o	-	•	o	-	-	-	o	24
KCD-U200	D	2 C/O	6 A	DC	•	-	o	-	-	o	o	-	-	o	-	o	-	o	-	o	-	•	o	-	o	-	-	25
KDN-U200	D	8 C/O	10 A	DC	-	o	o	-	-	o	•	-	-	o	-	-	-	o	-	o	-	•	o	-	-	-	-	26
SB	B	4/3 C/O	8 A	DC or AC	o	-	-	-	-	•	-	-	-	-	-	o	-	-	-	•	-	-	•	o	-	o	-	72
TFBBU 400	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	73
KCS/KCP-U200	CU	2 C/O	6 A	DC	•	-	o	-	-	o	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	142
SC	C	8 N/O - N/C	8 A	DC	•	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	143
Timer																												
CTD4-U [1+2]	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	•	-	o	-	o	-	-	-	•	o	-	-	•	-	27
TDB2-U200 [1]	D	2 C/O	6 A	DC	•	-	o	-	-	o	o	-	-	•	-	o	-	o	-	o	-	•	o	-	-	-	-	28
TDB4-U200 [1]	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	29
TDE-U200 [2]	D	1 C/O + 1 N/O	6 A	DC	•	-	o	-	-	-	o	-	-	-	-	o	-	o	-	o	-	•	o	-	-	-	-	30
TDE3-U200 [2]	D	3 C/O	10 A	DC	-	-	o	-	-	-	•	-	-	-	-	-	-	o	-	o	-	•	o	-	-	-	-	31
TDE4-U200 [2]	D	4 C/O	10 A	DC	-	o	o	-	-	-	•	-	-	-	-	-	-	o	-	o	-	•	o	-	-	-	-	32
TDE4N-U [2]	D	4 C/O	10 A	DC or AC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	•	-	33
TDBE-U200 [1+2]	D	2 C/O	6 A	DC	•	-	o	-	-	-	o	-	-	-	-	o	-	o	-	o	-	•	o	-	-	-	-	34
TDBE4-U200 [1+2]	D	3 C/O + 1 N/C	10 A	DC	-	o	o	-	-	-	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	35
TDBE4-U300 [1+2]	D	3 C/O + 1 N/C	10 A	AC	-	o	o	-	-	-	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	36

[1] Delay on pull-in
[2] Delay on drop-out

Selection table

SERVING SAFETY

Standard	•
Option	o
Not possible	-

Type	Platform	Contacts	Max. cont. current	Coil input	Weld-no-transfer contacts	$AgSnO_2$ contacts	Gold contacts	Gold bifurcated and silver contacts	Low operation voltage	Double make / double break	Magnetic arc blow-out	Current coil	LED indicator	Back EMF protection diode	Polarisation diode	Double zener coil protection diode (transil)	Make before break contacts	Special dust protection	Push-to-test button	Minimum temperature -40 °C	Minimum temperature -50 °C	Integrated snap-lock	Mechanical keying relay to socket	Manual reset control lever	Position indicator	Suitable for both DC and AC	Reversed polarity (+on 6 pin)	Page
TBAA 400 [1]	B	4 C/O	8 A	DC	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	74
TBAR 400 [2]	B	4 C/O	8 A	DC	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	75
TBAU 400 [1 or 2]	B	4 C/O	8 A	DC or AC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	76
TBLAU 400 [1 or 2]	B	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	77
TEAU [1 or 2]	A	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	78
TELAU 400 [1 or 2]	A	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	79
TBBAO 400 [1]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	80
TBSBAO 400 [1]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	81
TBBOR 400 [2]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	82
TBBU 400 [1 or 2]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	83
TBLBU 400 [1 or 2]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	84
NTBBOR 400 [2]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	85
THBBU 400 [1 or 2]	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	86
Timer & instantaneous																												
TDDB-U200 [1]	D	2 C/O + 2 C/O	8 A	DC	-	-	-	-	-	-	-	-	o	-	-	o	-	-	-	o	-	•	o	-	-	-	-	37
TDDB-U300 [1]	D	2 C/O + 2 C/O	8 A	AC	-	-	-	-	-	-	-	-	o	-	-	-	-	-	-	o	-	•	o	-	-	-	-	38
TDD4B2-U200 [1]	D	4 C/O + 2 C/O	10 A / 6 A	DC	-	-	o	-	-	-	•	-	•	-	-	-	-	o	-	o	-	•	o	-	-	-	-	39
TTBCA 200 [1]	B	1 C/O + 1 C/O	6 A	DC	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	87
TTBCR 200 [2]	B	1 C/O + 1 C/O	6 A	DC	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	89
TTBCA 400 [1]	B	2 C/O + 2 C/O	6 A	DC	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	88
TTBCR 400 [2]	B	2 C/O + 2 C/O	6 A	DC	•	-	-	-	-	-	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	90
Timer & monitoring																												
MTDV4 [1+2]	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	-	-	•	o	-	-	-	-	41
1-shot																												
WDE4-U200	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	49
WDE4-U300	D	4 C/O	10 A	AC	-	o	o	-	-	-	•	-	•	-	-	-	-	o	-	o	-	•	o	-	-	-	-	50
PDF3-U200	D	3 C/O	10 A	DC	-	o	o	-	-	-	•	-	•	-	-	-	-	o	-	o	-	•	o	-	-	-	-	51
TPBAU 400	B	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	91
TPBAUN 400	B	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	92
TPBBU 400	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	93
1-shot & instantaneous																												
WDDE-U200	D	2 C/O + 2 C/O	8 A	DC	-	-	-	-	-	-	-	-	o	-	-	o	-	-	-	o	-	•	o	-	-	-	-	52
WDDE-U300	D	2 C/O + 2 C/O	8 A	AC	-	-	-	-	-	-	-	-	o		-	-	-	-	-	o	-	•	o	-	-	-	-	53
2-shot																												
T2PBAU 400	B	4 C/O	8 A	DC	o	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	94
Flashing																												
FDA-U200	D	2 C/O	8 A	DC	-	-	-	-	-	-	-	-	-	-	-	•	-	o	-	o	-	•	o	-	-	-	-	43
FDA-U300	D	2 C/O	8 A	AC	-	-	-	-	-	-	-	-	-	-	-	•	-	o	-	o	-	•	o	-	-	-	-	44
FDA4-U200	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	45
FDC-U200	D	2 C/O	6 A	DC	-	-	-	-	-	-	o	-	-	-	-	-	-	o	-	o	-	•	o	-	-	-	-	46
FDC4-U200	D	4 C/O	10 A	DC	-	o	o	-	-	o	•	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	47
FDG-U200	D	1 N/O + 1 N/C	na	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	o	-	-	-	-	48
TCBBU 400	B	4 C/O	10 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	102
T2CBBU 400	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	103

[1] Delay on pull-in
[2] Delay on drop-out

Selection table

Standard	•
Option	o
Not possible	-

Type	Platform	Contacts	Max. cont. current	Coil input	Weld-no-transfer contacts	$AgSnO_2$ contacts	Gold contacts	Gold bifurcated and silver contacts	Low operation voltage	Double make / double break	Magnetic arc blow-out	Current coil	LED indicator	Back EMF protection diode	Polarisation diode	Double zener coil protection diode (transil)	Make before break contacts	Special dust protection	Push-to-test button	Minimum temperature -40 °C	Minimum temperature -50 °C	Integrated snap-lock	Mechanical keying relay to socket	Manual reset control lever	Position indicator	Suitable for both DC and AC	Reversed polarity (+on 6 pin)	Page
T2CBLBU 400	B	4 C/O	12 A	DC	•	-	-	-	-	•	-	-	•	-	-	-	-	-	-	•	-	-	•	-	-	-	-	104
1019	C	2 N/O	n/a	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-	146
Monitoring																												
DI-U900	D	2 C/O	10 A	DC or AC	-	o	o	-	-	o	•	•	-	-	-	-	-	o	-	o	-	•	o	-	-	-	-	40
UMD-U300	D	1 C/O + 1 N/O	6 A	AC	•	-	o	-	-	-	o	-	•	-	-	o	-	o	-	o	-	•	o	-	-	-	-	42
IB 200	B	2 C/O	1 A	DC	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	95
UB 001 / 002 / 003	B	1 / 2 / 3 N/O	0.25 A	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	96
UB 200	B	2 C/O	0.2 A	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	99
UB C200	B	2 C/O	3 A	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	100
UB A400	B	4 C/O	5 A	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	101
CU/CP-U900-D	CU	1 C/O + 1 N/O	6 A	DC or AC	•	-	o	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	129
CU/CP-U900-I	CU	1 C/O	6 A	DC or AC	•	-	o	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	130
UTC	C	1 N/O	3 A	DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	•	-	-	-	-	145

Specials

Type	Contacts	Max. cont. current	Coil input	Main features	Page
Instantaneous					
303	19 N/O or N/C	8 A	DC	Safety-critical, weld-no-transfer contacts	157
401	40 N/O or N/C	8 A	DC	Safety-critical, weld-no-transfer contacts	159
CMP	2 C/O	6 A	AC	No auxiliary power supply necessary, can be connected on 35 mm rail or any other other surface	161
RC 19A	1 C/O	6 A	AC	Input via wire through ring core saturation transformer	164
D4-U200 module	4 N/O or N/C	10 A	DC	Module with 4 pole relay and socket, easy replacement for contactors	165
Instantaneous & timer					
D8-U200 module	8 N/O or N/C	10 A	DC	Module with 8 pole relay and socket, easy replacement for contactors	166
Monitoring & timer					
NSE	2 C/O	14 A	AC	Over- and undervoltage monitoring, time delay on pull-in	162
NSR	2 C/O	14 A	AC	Over- and undervoltage monitoring, 3-phase, time delay on pull-in	163
Latching					
310	18 N/O or N/C	8 A	DC	Safety-critical, weld-no-transfer contacts	158
407	40 N/O or N/C	8 A	DC	Safety-critical, weld-no-transfer contacts	160

Electronic timer modules

Type	Time delay	Coil input	Main features	Page
Time module				
TB AO	0.25 s...40 s	DC	Converts instantaneous relay(s) to time delay relay(s), delay on pull-in, B 400 platform	176
TB OR	0.25 s...40 s	DC	Converts instantaneous relay(s) to time delay relay(s), delay on drop-out, B 400 platform	177
TALAO	0.25 s...63.75 min	DC	Converts instantaneous relay(s) to time delay relay(s), delay on pull-in, A 400 platform	178
TALOR	0.25 s...63.75 min	DC	Converts instantaneous relay(s) to time delay relay(s), delay on drop-out, A 400 platform	179
TBL AO	0.25 s...63.75 min	DC	Converts instantaneous relay(s) to time delay relay(s), delay on pull-in, B 400 platform	180
TBL OR	0.25 s...63.75 min	DC	Converts instantaneous relay(s) to time delay relay(s), delay on drop-out, B 400 platform	181
TA3	0.125 s...90 min	DC	Converts instantaneous relay(s) to time delay relay(s), delay on drop-out, A 400 platform, parallel wiring	182
Time module, flashing				
TCAL	0.25 s...63.75 min	DC	Converts instantaneous relay(s) to flashing relay(s), symmetrical, A 400 platform	183
TAC	3 s...30 s	DC	Windshield wiper module	184

SERVING SAFETY

D-platform

Compact multi functional relays for all different kind of applications. Up to 4 change-over contacts these relays all have the same base of 40 x 40 mm. 8 pole configurations in different types also available.

D-platform

Design features

The unique D-platform is specifically designed to solve demanding applications in the railway market: high DC breaking capacity and inductive load switching, offering long electrical life and low life cycle costs. The D-platform offers ultimate flexibility to be suitable for many railway applications.

LED indication

Joke + springs

The joke + springs system is adjusted to calibrate the contact pressure of the normally closed contacts.

Suitable for hazardous areas

Corrosion resistant.
Shock & vibration resistant.
Integrated snap-lock.

Cover

Transparent cover for visual check. On the top clear indication of type, contact arrangement and coil voltage.

Switching capacity

1 mA...10 A (200 A overload).
High DC breaking capacity.

Contacts

Up to 4 change-over contacts.
Standard, Ag contact material.
$AgSnO_2$ or goldplated contact material on request.
Calibrated contact pressure.

Back EMF diode

Integrated to suppress the back EMF from de-energizing the coil, to protect the external electronic control system connected to the relay.

Magnetic arc blow-out

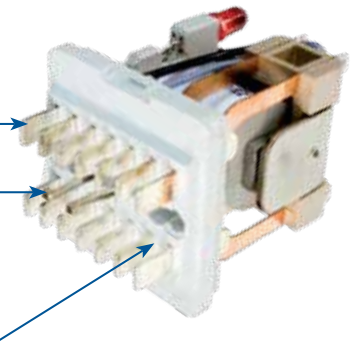
For inductive loads.

Sockets

We offer a wide range of mounting sockets for wall, rail, flush or PCB-mounting. Connections with screw, spring clamp, faston, soldering or crimp terminals.

Mors Smitt unique pinning

14 silver plated, flat pins, for excellent socket connection and protection against corrosion.



Snap-lock

Integrated relay retaining clip for sturdy mounting in the socket, prevents reversed mounting.

Keying

Optional positive mechanical keying relay to socket.

Also available with 8 change-over contacts in bigger housing (model D8 & KDN).

SERVING SAFETY

Options

The D-platform relays (and derived models) can be equipped with many options. The concept allows composing the D-platform relays to almost any solution. However not all options or combinations are possible. All possible options are mentioned in the product pages in this chapter. Detailed information about the options and combinations is mentioned in the product datasheets, available on www.morssmitt.com

W	**Weld-no-transfer**	Contacts are mechanically connected in such a way that N/C contacts and N/O contacts can never be closed at the same time. - If a N/O contact fails to open and the relay de-energises, none of the N/C contacts closes - If a NC contact fails to open and the relay energises, none of the NO contacts closes Weld-no-transfer contacts according EN 50205
M	**AgSnO2 contacts**	Contacts which are highly resistant to welding for safety applications. Mimimum contact current must be 100 mA.
E	**Goldplated contacts**	Silver contacts with thin layer of gold to have a good resistance against corrosive atmospheres. Suitable for switching low currents and low voltages.
DGG	**Low operating voltage**	The relay has a large pull-in voltage range of 40% - 125% of the nominal voltage.
Y	**Double make / double break**	Higher breaking capacity and longer contact life due to other construction of contacts.
B	**Magnetic arc blow-out**	Higher breaking capacity and longer contact life due to built-in magnet which causes an increase in arc length (standard for most relays).
L	**LED indicator**	Built-in LED(s) to indicate the presence of power supply and the energizing of the coil.
X	**Bipolar LED indicator**	Built-in bipolar LED(s) to indicate the presence of power supply and the energizing of the coil.
D	**Back EMF protection diode**	Diode to prevent the system against a back EMF surge when the relay coil is de-energized (standard for most relays).
P	**Polarisation diode**	Protection of the relay against reversed polarity.

Options D-platform

Options

Q	Double zener coil protection diode	Transient voltage suppressor to protect the relay coil against surges and to protect the system against a back EMF surge when the relay coil is de-energized.
11	Make before break contact	Contact 4-12 will make before contact 3-13 will break during pull-in. During release, contact 3-13 will make before contact 4-12 will break. Contact 5-7/9 is a normal change-over contact
K	Special dust protection	Relay cover sealed with sealant.
T	Push-to-test button	Relays equipped with test button to operate the relays manually.
C	Low temperature	The minimum operating temperature is decreased from -25 °C to -40 °C or -50 °C (depending on product).
Snap-lock	Integrated snap-lock	Integrated 'snap-lock' which will hold the relay into the socket under all circumstances and mounting directions, no external retaining clip necessary. Prevents reversed mounting. (standard for most relays)
Key-ing	Mechanical keying relays to socket	Positive mechanical keying relays to socket to prevent a relay being inserted in a wrong socket. (standard for most relays)
S	Position indicator	Mechanical indicator to indicate visually the position of the relay contacts.
X2	Suitable for both DC and AC	Relay coil with rectifier circuit to make the relay suitable for both DC and AC.
X3	Reversed polarity	The polarity of the coil is reversed.
Z	No diode	No diode inside the relay.

D-U200

10 A, 4 C/O

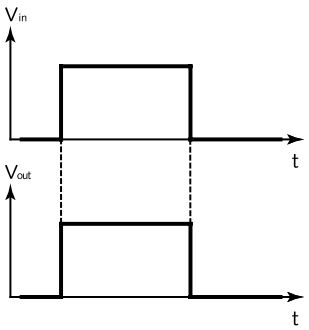
Plug-in railway relay with 4 change-over contacts.

- Compact plug-in design
- Instantaneous, 4 C/O contacts
- Back EMF suppression diode
- Magnetic arc blow-out
- Integrated snap-lock
- High DC breaking capacity
- Optional weld-no-transfer contacts according EN 50205
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

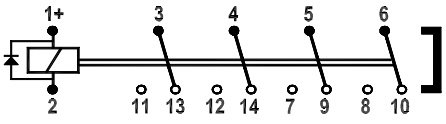
Options

- Weld-no-transfer contacts
- Low temperature (-50 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- LED coil indicator
- Bipolar LED indicator
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Polarisation diode
- Double zener diode
- Push-to-test button
- Coil for both AC and DC
- Double make / double break (-50 °C)
- No diode
- Make before break contact
- Reversed polarity

Timing diagram



Connection diagram



Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	50 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil * (Ω)	Icoil (mA)
D-U201	24	16.8	30	2.5	270	89
D-U202	48	33.6	60	4.8	1103	44
D-U203	72	50.4	90	7.2	2406	30
D-U204	110	77	137.5	11	5330	21
D-U205	96	67.2	120	9.5	4400	22
D-U206	12	8.4	15	1.2	72	167
D-U207	36	25.2	45	3.5	562	64

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

D-U200-W

Weld-no-transfer, 10 A, 4 N/O-N/C

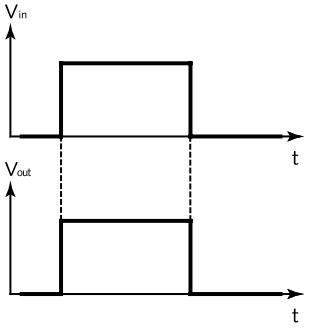
Plug-in railway relay with 4 normally open-normally closed weld-no-transfer contacts.

- Compact plug-in design
- Instantaneous, 4 N/O-N/C contacts
- Weld-no-transfer contacts according EN 50205
- Back EMF suppression diode
- Magnetic arc blow-out
- Integrated snap-lock
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

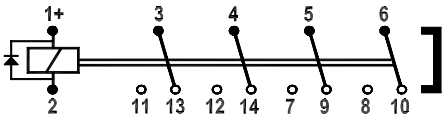
Options

- Low temperature (-50 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- LED coil indicator
- Bipolar LED indicator
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Polarisation diode
- Double zener diode
- Coil for both AC and DC
- Double make / double break (-50 °C)
- No diode
- Make before break contact
- Reversed polarity

Timing diagram



Connection diagram



Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Contact gap	**≥ 1.5 mm**
Electrical life expectancy	**Depends on application, see datasheet for more information**

Mechanical & environmental characteristics

Mechanical life	50 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil * (Ω)	Icoil (mA)
D-U201-W	24	16.8	30	2.5	270	89
D-U202-W	48	33.6	60	4.8	1103	44
D-U203-W	72	50.4	90	7.2	2406	30
D-U204-W	110	77	137.5	11	5330	21
D-U205-W	96	67.2	120	9.5	4400	22
D-U206-W	12	8.4	15	1.2	72	167
D-U207-W	36	25.2	45	3.5	562	64

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

D-U300

AC coil, 10 A, 4 C/O

Plug-in railway relay with 4 change-over contacts suitable for AC coil voltages with a frequency of 50/60 Hz.

- Compact plug-in design
- Instantaneous, 4 C/O contacts
- AC coil
- Magnetic arc blow-out
- Integrated snap-lock
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- LED coil indicator
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Push-to-test button
- Double make / double break (-40 °C)

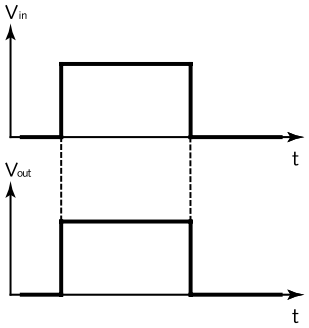
Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

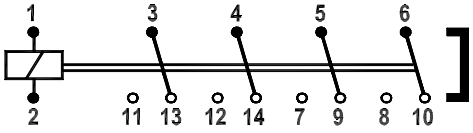
Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Freq (Hz)	Umin (VAC)	Umax (VAC)	Udrop-out (VAC)	Pnom (VA)
D-U301	24	50	16.8	30	12	3
D-U303	220	50	176	275	150	3
D-U305	110	50	88	137.5	70	3
D-U307	380	50	304	420	190	3
D-U308	120	60	96	150	72	3
D-U309	110	60	88	137.5	na	3
D-U310	220	60	176	275	na	3
D-U313	230	50	184	287.5	na	3
D-U314	254	60	203	280	na	3
D-U315	440	60	352	484	286	3
D-U317	400	60	320	440	260	3

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

DGG-U200

Large pull-in voltage range, 10 A, 2 C/O

Plug-in railway relay with 2 change-over contacts and a large pull-in voltage range: 40 % - 125 % of the nominal voltage.

- Compact plug-in design
- Instantaneous, 4 C/O contacts
- Sensitive coil (40 % U_{nom})
- Low operating voltage
- Back EMF suppression diode
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Polarisation diode
- Double zener diode
- Push-to-test button
- Double make / double break (-40 °C)
- No diode

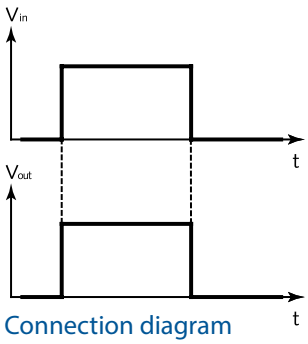
Contact data

Amount and type of contacts	**2 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

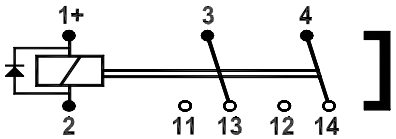
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C (with option -40 °C)
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Connection diagram



Nominal voltage

Type	U_{nom} (VDC)	U_{min} (VDC)	U_{max} (VDC)	$U_{drop-out}$ (VDC)	R_{coil} * (Ω)	$I_{coil-nom}$ (mA)	P_{nom} (W)
DGG-U201	24	9.6	30	1.9	270	85.7	2.1
DGG-U202	48	19.2	60	3.8	1103	43.2	2.1
DGG-U203	72	28.8	90	5.8	2406	28.8	2.1
DGG-U204	110	44	137.5	8.8	5330	18.9	2.1
DGG-U205	96	38.4	120	7.7	4400	22.3	2.1
DGG-U206	12	4.8	15	1.0	72	181	2.2
DGG-U207	36	14.4	45	2.9	562	62	2.2

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

D8-U200

10 A, 8 C/O

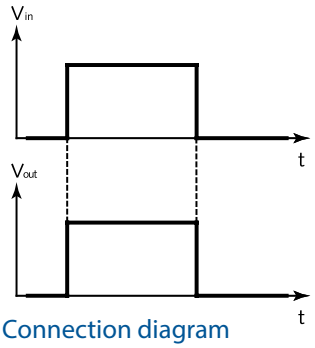
Plug-in railway relay with 8 change-over contacts.

- Compact plug-in design
- Instantaneous, 8 C/O contacts
- Back EMF suppression diode
- Magnetic arc blow-out
- 2 integrated snap-locks
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

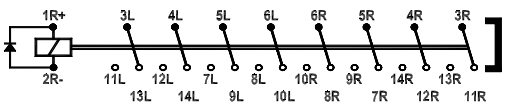
Options

- Low temperature (-50 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- LED coil indicator
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Polarisation diode
- Double zener diode
- Coil for both AC and DC
- Double make / double break (-50 °C)
- No diode

Timing diagram



Connection diagram



Contact data

Amount and type of contacts	**8 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	300 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Rcoil * (Ω)	Pnom (W)
D8-U201	24	16.8	30	233	2.8
D8-U202	48	33.6	60	680	2.8
D8-U203	72	50.4	90	1590	2.8
D8-U204	110	77	137.5	3769	2.8
D8-U205	96	67.4	120	3547	2.8
D8-U206	12	8.4	15	76	2.8
D8-U207	36	25.2	45	680	2.8

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 60
Detailed information and datasheets available on www.morssmitt.com

BD-U200

10 A, 3 C/O + 1 C/O

Plug-in bistable railway relay with 3 change-over contacts and 1 normally closed contact. The contacts remain in the last powered postion.

- Compact plug-in design
- Latching, bistable relay, 3 C/O contacts and 1 N/C contact
- 2 combined coils
- Magnetic arc blow-out
- Transparant cover
- Integrated snap-lock
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C), max. contact current 8 A
- Back EMF protection diode
- Gold plated contacts
- Special dust protection
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Polarisation diode
- Reversed polarity (+ on pin 6)
- Double make / double break (-40 °C)

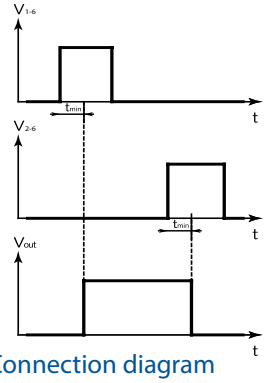
Contact data

Amount and type of contacts	**3 C/O + 1 N/C**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Timing diagram

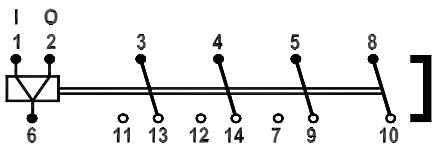


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Rcoil * (Ω)	Pnom (W)
BD-U201	24	16.8	30	618	1.7
BD-U202	48	33.6	60	2383	1.7
BD-U203	72	50.4	90	6550	1.7
BD-U204	110	77	137.5	14700	1.7
BD-U205	96	67.2	120	14700	1.7
BD-U206	12	8.4	15	135	1.7
BD-U207	36	25.2	45	1425	1.7

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

KCD-U200

6 A, 2 C/O

Plug-in bistable railway relay with 4 change-over contacts. The contacts remain in the last powered position. The position is clearly visible (position indicator optional).

- Compact plug-in design
- Latching (bistable) relay, 2 C/O contacts
- 2 galvanic isolated coils
- Weld-no-transfer contacts
- Transparant cover
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Back EMF protection diode
- Gold plated contacts
- Special dust protection (only for fixed time setting)
- Double zener diode
- Position indicator
- Double make / double break

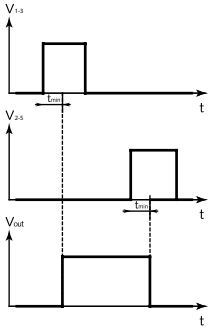
Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Maximum switching capacity and electrical life expectancy	**See curves on page 133**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	125 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Timing diagram

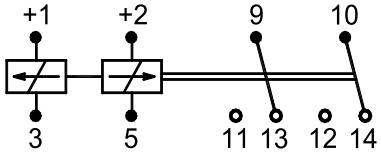


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Rcoil * (Ω)	Inom (mA)
KCD-U201	24	16.8	30	500	48
KCD-U202	48	33.6	60	2060	23
KCD-U203	72	50.4	90	4900	15
KCD-U204	110	77	137.5	7800	11
KCD-U205	96	67.2	120	7800	12
KCD-U206	12	8.4	15	137	88
KCD-U207	36	25.2	45	1300	29

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

KDN-U200

10 A, 8 C/O

Plug-in bistable railway relay with 8 change-over contacts. The contacts remain in the last powered position. The position is clearly shown via an indicator.

- Compact plug-in design
- Latching (bistable), 8 C/O contacts
- 2 galvanic isolated coils
- Clear position indicator
- Magnetic arc blow-out
- 2 integrated snap-locks
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Contact data

Amount and type of contacts	**8 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

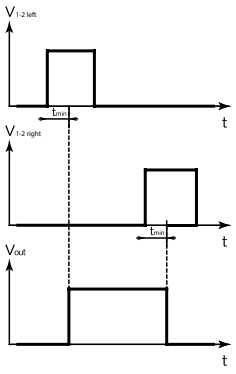
Options

- Low temperature (-40 °C), max. contact current 8 A
- Back EMP protection diode
- Gold plated contacts
- Special dust protection
- $AgSnO_2$ contacts, high resistant to welding
- No magnetic arc blow-out
- Double zener diode
- Double make / double break (-40 °C)

Mechanical & environmental characteristics

Mechanical life	2 x 10^6 operations
Weight	305 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

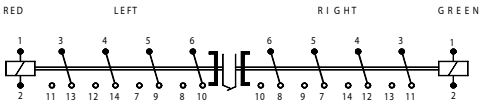


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil * (Ω)	Pnom (W)
KDN-U201	24	16.8	30	9.6	178	3.2
KDN-U202	48	33.6	60	19.2	666	3.3
KDN-U203	72	50.4	90	28.8	2059	3.3
KDN-U204	110	77	137.5	44	3850	3.0
KDN-U205	96	67.2	120	38.4	3600	2.6
KDN-U206	12	8.4	15	4.8	94	3.3
KDN-U207	36	25.2	45	14.4	370	3.2

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 60
Detailed information and datasheets available on www.morssmitt.com

CTD4-U200

Multifunction customizable, delay-on/off, 10 A, 4 C/O

Plug-in electronic railway customizable timer relay with four change-over contacts. Fully customizable according customer's requirements concerning timing diagram and delay type.

Almost any timing diagram is possible: for example time delays with delay on pull-in, on drop-out or both, symmetrical or asymmetrical flashing, 1-shot, 2-shot, 3-shot etc. or a combination of all these.

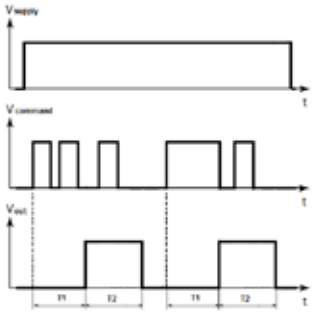
Delay/pulse times are adjustable with 1 or 2 lockable knobs. The relay can also be supplied with fixed delay/pulse times (no knobs).

- Compact plug-in design
- Fully customizable timer relay
- 4 time delayed C/O contacts or 2 time delayed C/O contacts and 2 instantaneous C/O contacts
- Delay/pulse times adjustable with 1 or 2 lockable knobs
- Delay/pulse times: between 0 s...∞ (no limits)
- Two LEDs for status indication
- Suitable for DC and AC voltage
- Flat, square and silver plated relay pins for excellent socket connection

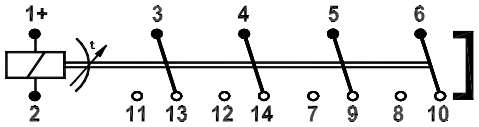
Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non-weldable contact
- No magnetic arc blow-out
- Double zener diode
- Double make/double break contacts

Timing diagram example
(depending on configuration)



Connection diagram example
(depending on configuration)



Time delay

Time delay function	**Fully customizable: e.g. delay on pull-in and/ or delay on drop-out, flashing, 1-shot, 2-shot combinations**
Available time ranges	**Between 0 s...∞ (no limits)**

Contact data

Number and type of contacts	4 C/O (number of change-over contacts depends on desired timing diagram)
Maximum make current	16 A
Maximum continuous current	10 A
Maximum switching voltage	250 VDC, 440 VAC
Minimum switching voltage	12 V **(5 V with gold plated contacts)**
Minimum switching current	10 mA **(1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag
Maximum switching capacity and electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	190 g (depending on configuration)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Nominal voltage

Depends on requirements, typical any value between 24...220 VAC/VDC

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

TDB2-U200

Delay-on, 6 A, 2 C/O

Plug-in electronic railway timer relay with 2 change-over contacts. When the relay is activated, there is a delay on pull-in.

- Compact plug-in design
- Timer delay relay, delay on pull-in, 2 C/O contacts
- Delay time adjustable with lockable knob
- Weld-no-transfer contacts
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Time delay

Time delay function	**Delay on pull-in**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3... 3 min	**0.6...6 min**	**1...10 min**
	3...30 min		

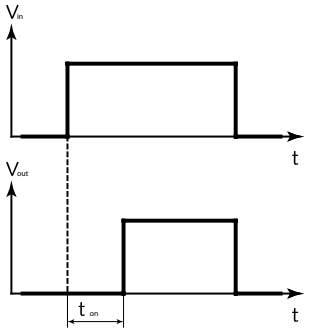
Contact data

Amount and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	**Ag**
Maximum switching capacity and electrical life expectancy	**See curves on page 57**

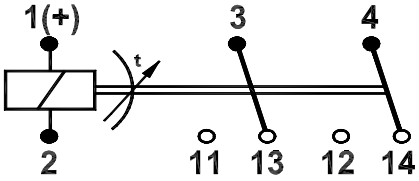
Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- Double zener diode over input
- Double make / double break

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	110 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDB2-U201	24	16.8	30
TDB2-U202	48	33.6	60
TDB2-U203	72	50.4	90
TDB2-U204	110	77	137.5
TDB2-U205	96	67.2	120
TDB2-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDB4-U200

Delay-on, 10 A, 4 C/O

Plug-in electronic railway timer relay with 4 change-over contacts. When the relay is activated, there is a delay on pull-in.

- Compact plug-in design
- Timer delay relay, delay on pull-in, 4 C/O contacts
- Delay time adjustable with lockable knob
- Two LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non-weldable contact
- No magnetic arc blow-out
- Double zener diode over input
- Double make / double break

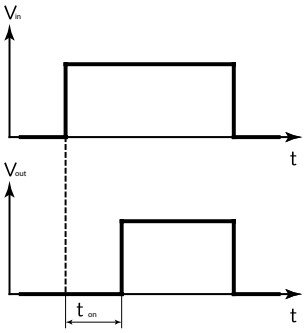
Time delay

Time delay function	**Delay on pull-in**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3... 3 min	**0.6...6 min**	**1...10 min**
	3...30 min		

Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VDC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

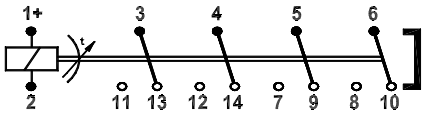
Timing diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	160 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	93 %

Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDB4-U201	24	16.8	30
TDB4-U202	48	33.6	60
TDB4-U203	72	50.4	90
TDB4-U204	110	77.0	138
TDB4-U205	96	67.2	120
TDB4-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDE-U200

Delay-off, 6 A, 1 C/O + 1 N/O

Plug-in electronic railway timer relay with 1 change-over contact and 1 normally open contact. When the relay is not energized anymore, there is a delay on drop-out, whithout any auxiliary power supply.

- Compact plug-in design
- Timer delay relay, delay on drop-out (without auxiliary power supply), 1 C/O contact and 1 N/O contact
- Delay time adjustable with lockable knob
- One LED for voltage presence
- Weld-no-transfer contacts
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- Double zener diode over input

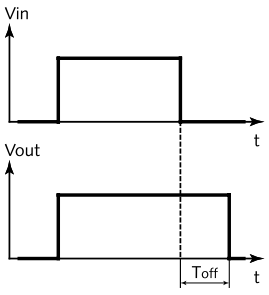
Time delay

Time delay function	**Delay on drop-out (without auxiliary power supply)**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**1...10 s**
	3...30 s	**10...100 s**	

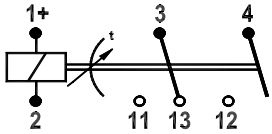
Contact data

Amount and type of contacts	**1 C/O + 1 N/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	**Ag**
Maximum switching capacity and electrical life expectancy	**See curves on page 133**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	130 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Nominal voltage

Type	U_{nom} (VDC)	U_{min} (VDC)	U_{max} (VDC)
TDE-U201	24	16.8	30
TDE-U202	48	33.6	60
TDE-U203	72	50.4	90
TDE-U204	110	77.0	138
TDE-U205	96	67.2	120
TDE-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

TDE3-U200

Delay-off, 10 A, 3 C/O

Plug-in electronic railway timer relay with 3 change-over contacts and delay-off function. The relay is energized by auxiliary supply and activated by an external N/O contact.

- Compact plug-in design
- Timer delay relay, delay on drop-out (with auxilary power supply) , 3 C/O contacts
- Delay time adjustable with lockable knob
- 2 LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- AgSnO2 'non weldable' contacts
- No magnetic arc blow-out

Time delay

Time delay function	**Delay on drop-out with auxiliary power supply**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3... 3 min	**0.6...6 min**	**1...10 min**
	3...30 min		

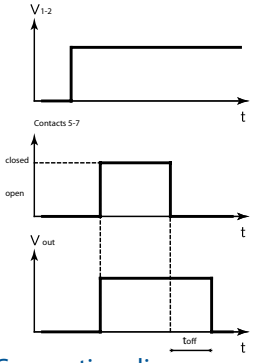
Contact data

Amount and type of contacts	**3 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VDC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag**
Electrical life expectancy	**See curves on page 57**

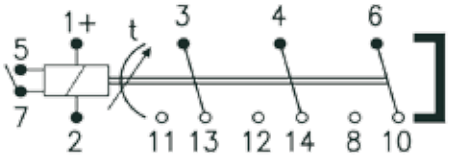
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	140 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDE-U201	24	16.8	30
TDE-U202	48	33.6	60
TDE-U203	72	50.4	90
TDE-U204	110	77.0	138
TDE-U205	96	67.2	120
TDE-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDE4-U200

Delay-off, 10 A, 4 C/O

(Model TDE4-200 shown)

Plug-in electronic railway timer relay with 4 change-over contacts. When the relay is not energized anymore, there is a delay on drop-out, whithout any auxiliary power supply.

- Compact plug-in design
- Timer delay relay, delay on drop-out (without auxiliary power supply), 4 C/O contacts
- Delay time adjustable with lockable knob
- One LED for voltage presence
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- No magnetic arc blow-out

Time delay

Time delay function	**Delay on drop-out (without auxiliary power supply)**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	10...100 s		

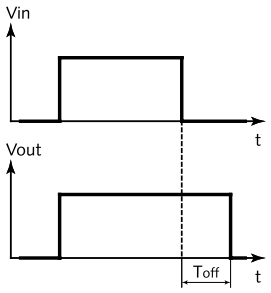
Contact data

Number and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VDC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

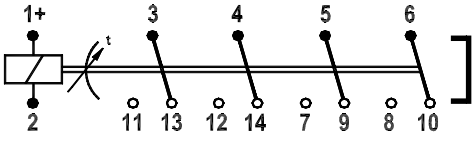
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	255 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDE4-U201	24	16.8	30
TDE4-U202	48	33.6	60
TDE4-U203	72	50.4	90
TDE4-U204	110	77.0	138
TDE4-U205	96	67.2	120
TDE4-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDE4N-U

Delay-off, 10 A, 4 C/O

Plug-in electronic railway timer relay with 4 change-over contacts. When the relay is not energized anymore, there is a delay on drop-out, whithout any auxiliary power supply.

- Compact plug-in design
- Timer delay relay, delay on drop-out (without auxiliary power supply), 4 C/O contacts
- Delay time adjustable with lockable knob
- One LED for voltage presence
- Magnetic arc blow-out
- Suitable for AC and DC voltage
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- $AgSnO_2$ 'non weldable' contacts
- Extra dust protection
- Double zener diode over input
- Double make / double break

Time delay

Time delay function	**Delay on drop-out (without auxiliary power supply)**		
Available time ranges, adjustable (xx)	**0...1 s**	**0...3 s**	**0...6 s**
	0...10 s	**0...30 s**	**0...60 s**
	0...100 s	**0...180 s**	

Contact data

Number and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VDC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

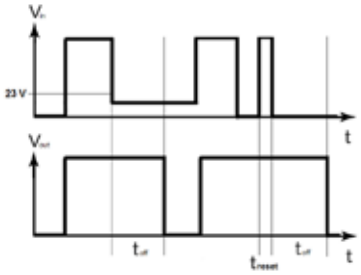
Mechanical life	30 x 10^6 operations
Weight	190 g (with adjustable knob)
Operating temperature	-25 °C...+70 °C
Humidity	93 %

Nominal voltage

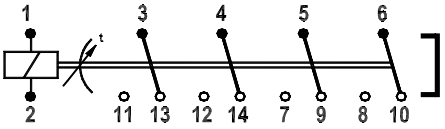
Type	Unom (V)	Umin (V)	Umax (V)
TDE4N-U	AC/DC 72-230	AC 57.6 DC 50.4	AC 276 DC 287.5

Other types on request

Timing diagram



Connection diagram



Dimensions See page 56
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

TDBE-U200

Delay-on & delay-off, 6 A, 2 C/O

Plug-in electronic railway timer relay with delay on & delay-off function and 2 change-over contacts. The delay times are independently adjustable with 2 lockable knobs.

- Compact plug-in design
- Timer delay relay with auxiliary supply, delay on pull-in and on drop-out, 2 C/O contacts
- Both delay times independently adjustable with 2 lockable knobs
- 2 LEDs for status indication
- Weld-no-transfer contacts
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- Double zener diode over input

Time delay

Time delay function	**Delay on pull-in and delay on drop-out**		
Available time ranges, independently adjustable for pull-in (x) and drop-out (y)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3... 3 min	**0.6...6 min**	**1...10 min**
	3... 30 min	**6...60 min**	
	Every combination of t_x and t_y is possible		

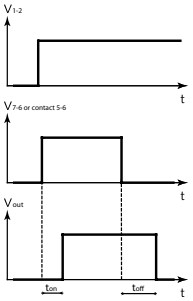
Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	**Ag + 0.2 µm Au**
Maximum switching capacity and electrical life expectancy	**See curves on page 133**

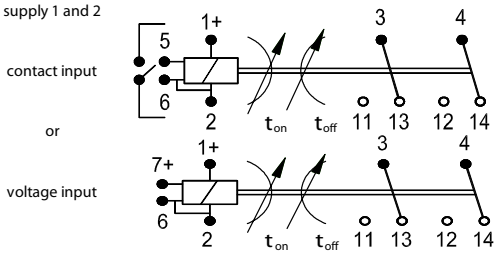
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	130 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDBE-U201	24	16.8	30
TDBE-U202	48	33.6	60
TDBE-U203	72	50.4	90
TDBE-U204	110	77.0	138
TDBE-U205	96	67.2	120
TDBE-U207	36	25.2	45
Other types on request			

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDBE4-U200

Delay-on & delay-off, 10 A, 3 C/O + 1 N/C

Plug-in electronic railway timer relay with delay-on and delay-off function and three change-over contacts and one normally-closed contact. The delay times are independently adjustable with two lockable knobs. The relay needs an auxiliary supply and can be activated with an external N/O contact or with DC supply voltage.

- Compact plug-in design
- Timer delay relay with auxiliary supply, delay on pull-in and on drop-out, 3 C/O contacts and 1 N/C contact
- Both delay times independently adjustable with 2 lockable knobs
- 2 LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- $AgSnO_2$ 'non weldable' contacts
- Extra dust protection
- Double zener diode over input

Time delay

Time delay function	**Delay on pull-in and delay on drop-out**		
Available time ranges, independently adjustable for pull-in (x) and drop-out (y)	**0...1 s**	**0...3 s**	**0...6 s**
	0...10 s	**0...30 s**	**0...60 s**
	0... 3 min	**0...6 min**	**0...10 min**
	0... 30 min	**0...60 min**	**0...120 min**

Every combination of t_x and t_y is possible

Other ranges on request

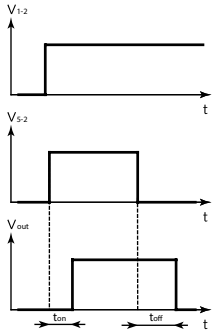
Contact data

Number and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R < 15 ms)** **230 VDC, 10 A (cos φ > 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical lif expectancy	**See curves on page 57**

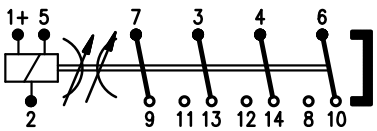
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	190 g (with one adjustable knob)
Operating temperature	-25 °C...+70 °C
Humidity	93 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDBE4-U201	24	16.8	30
TDBE4-U207	36	25.2	45
TDBE4-U202	48	33.6	60

Other ranges on request

Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDBE4-U300

Delay-on & delay-off, 10 A, 3 C/O + 1 N/C

Plug-in electronic railway timer relay with delay-on and delay-off function and three change-over contacts and one normally-closed contact. The delay times are independently adjustable with two lockable knobs. The relay needs an auxiliary supply and can be activated with an external N/O contact or with AC supply voltage.

- Compact plug-in design
- Timer delay relay with auxiliary supply, delay on pull-in and on drop-out, 3 C/O contacts and 1 N/C contact
- Both delay times independently adjustable with 2 lockable knobs
- 2 LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- $AgSnO_2$ 'non weldable' contacts
- Extra dust protection

Time delay

Time delay function	**Delay on pull-in and delay on drop-out**		
Available time ranges, independently adjustable for pull-in (x) and drop-out (y)	**0...1 s**	**0...3 s**	**0...6 s**
	0...10 s	**0...30 s**	**0...60 s**
	0... 3 min	**0...6 min**	**0...10 min**
	0... 30 min	**0...60 min**	**0...120 min**

Every combination of t_x and t_y is possible

Other ranges on request

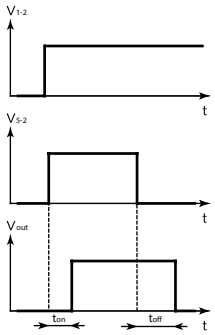
Contact data

Number and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R < 15 ms)** **230 VDC, 10 A (cos φ > 0.7)**
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Electrical lif expectancy	**See curves on page 57**

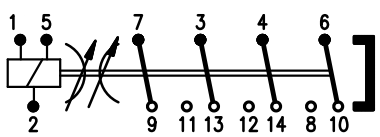
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	190 g (with one adjustable knob)
Operating temperature	-25 °C...+70 °C
Humidity	93 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VSC)	Frequency (Hz)	Umin (VDC)
TDBE4-U301	24	50/60	19.2
TDBE4-U325	96	50/60	76.8
TDBE4-U305	110	50/60	88.0
TDBE4-U303	220	50/60	176.0

Other types on request

Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDDB-U200

Delay-on, 8 A, 2 instantaneous C/O + 2 timer C/O

Plug-in electronic railway timer relay with 2 instantaneous change-over contacts and 2 time delayed change-over contacts. When the relay is activated, there is a delay on pull-in for the time delayed contacts.

- Compact plug-in design
- Instantaneous and timer relay, 2 instantaneous C/O and 2 timer delay C/O contacts
- Delay time adjustable with lockable knob
- Transparant cover
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- 2 LEDs for status indication
- Double zener diode over input

Time delay

Time delay function	**Delay on pull-in and instantaneous**		
Available time ranges, independently adjustable for pull-in (x) and drop-out (y)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3... 30 min		

Contact data

Number and type of contacts	**2 instantaneous C/O and 2 time delay C/O**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Maximum contact resistance	**25 mΩ**
Material	**AgNi + 0.15 µm Au**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Mechanical & environmental characteristics

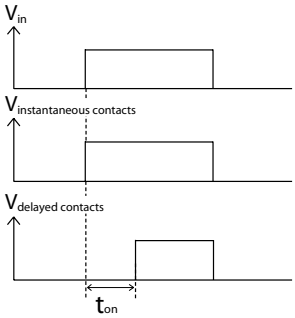
Mechanical life	20 x 10^6 operations
Weight	125 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Nominal voltage

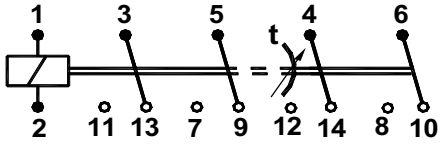
Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDDB-U201	24	16.8	30
TDDB-U202	48	33.6	60
TDDB-U203	72	50.4	90
TDDB-U204	110	77.0	138
TDDB-U205	96	67.2	120
TDDB-U207	36	25.2	45

Other types on request

Timing diagram



Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

TDDB-U300

Delay-on, 8 A, 2 instantaneous C/O + 2 timer C/O

Plug-in electronic railway timer relay with 2 instantaneous change-over contacts and 2 time delay change-over contacts, suitable for AC input voltages with a frequency of 50 Hz. When the relay is activated, there is a delay on pull-in for the time delayed contacts.

- Compact plug-in design
- Instantaneous and timer relay, 2 instantaneous C/O and 2 time delay C/O contacts
- Delay time adjustable with lockable knob
- AC input
- Transparant cover
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- 2 LEDs for status indication

Time delay

Time delay function	**Delay on pull-in and instantaneous**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3...30 min		

Contact data

Number and type of contacts	**2 instantaneous C/O and 2 time delay C/O**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Maximum contact resistance	**25 mΩ**
Material	**AgNi + 0.15 µm Au**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Mechanical & environmental characteristics

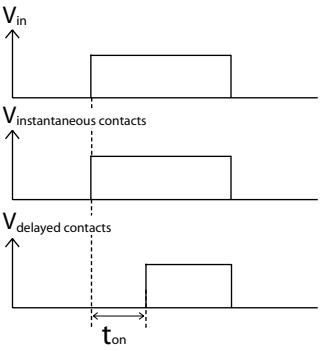
Mechanical life	20 x 10^6 operations
Weight	125 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	80 %

Nominal voltage

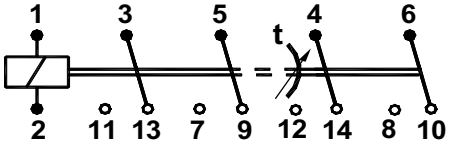
Type	Frequency (Hz)	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDDB-U306	50	240	192	288

Other types on request

Timing diagram



Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

TDD4B2-U200

Delay-on, 8 A, 4 instantaneous C/O + 2 timer C/O

Plug-in electronic railway timer relay with 4 instantaneous change-over contacts and 2 time delay change-over contacts. When the relay is activated, there is a delay on pull-in for the time delayed contacts.

- Compact plug-in design
- Instantaneous and timer relay, 4 instantaneous C/O and 2 delay on C/O contacts
- Fixed time delay (no knob)
- Also available with adjustable time delay with lockable knob
- Magnetic arc blow-out for instantaneous contacts
- Transparant cover
- Integrated snap-lock
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- No magnetic arc blow-out
- Double zener diode

Time delay

Time delay function	**Delay on pull-in and instantaneous**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3...30 min	**6...60 min**	

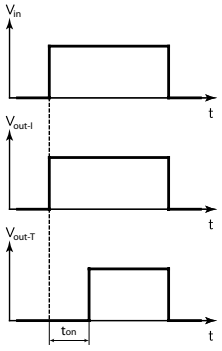
Contact data delayed contacts

Number and type of contacts	**2 C/O**	**4 C/O**
Maximum make current	**10 A**	**16 A**
Peak inrush current	**-**	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**8 A**	**10 A**
Maximum switching voltage	**350 VDC, 380 VAC**	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V**	**12 V**
Minimum switching current	**10 mA**	**10 mA**
Maximum breaking capacity	**-**	**110 VDC, 8 A (L/R ≤ 15 ms) 230 VDC, 10 A (cos φ ≥ 0.7)**
Maximum contact resistance	**-**	**10 mΩ**
Material	**Ag**	**Ag**
Maximum switching capacity and electrical life expectancy	**See curves on datasheet**	**See curves on datasheet**

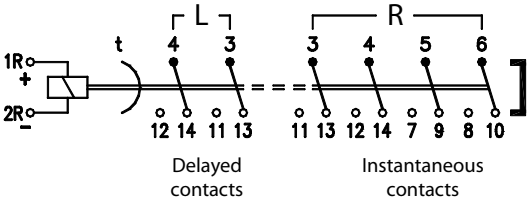
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	260 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
TDD4B2-U201	24	16.8	30
TDD4B2-U202	48	33.6	60
TDD4B2-U203	72	50.4	90
TDD4B2-U204	110	77.0	137.5
TDD4B2-U205	96	67.2	120
TDD4B2-U207	36	25.2	45

Dimensions See page 55
Mounting possibilities & sockets See page 60

Detailed information and datasheets available on www.morssmitt.com

DI-U900

Current monitoring, 10 A, 2 C/O

Plug-in railway relay with 2 change-over contacts.

- Compact plug-in design
- Current detection relay, 2 C/O contacts
- Magnetic arc blow-out
- Integrated snap-lock
- High DC breaking capacity
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C), max. contact current 8 A
- Gold plated contacts
- Special dust protection
- $AgSnO_2$ contacts, high resistant to welding
- Double make / double break

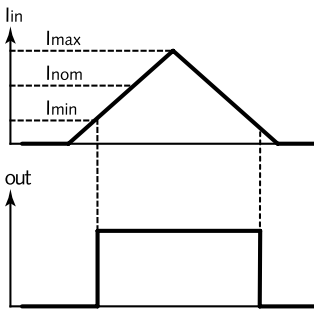
Contact data

Amount and type of contacts	**2 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	130 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Currents DC

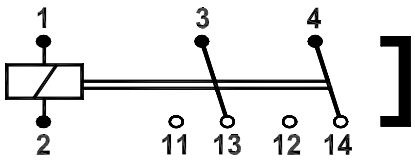
Type	Inom (ADC)	Imin (ADC)	Imax (ADC)	Rcoil * (Ω)	Pnom (W)
D-U901	2.7	2.16	5.4	0.04	0.3
D-U902	1.2	0.96	2.4	0.2	0.3
D-U903	0.39	0.312	0.78	2.1	0.3
D-U904	0.12	0.096	0.24	22	0.3
D-U905	0.082	0.066	0.164	45	0.3

Currents AC, 50 Hz

Type	Inom (AAC)	Imin (AAC)	Imax (AAC)	Rcoil * (Ω)	Pnom (VA)
D-U950	3.3	2.64	4.62	0.035	0.3
D-U951	2.2	1.76	3.08	0.088	0.3
D-U952	1.0	0.8	1.4	0.31	0.3
D-U953	0.56	0.448	0.784	0.91	0.3
D-U954	0.27	0.216	0.378	3.1	0.3

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

MTDV4-U200

Voltage monitoring, delay-on/off, 10 A, 4 C/O

Plug-in electronic voltage monitoring relay with optional delay-on and delay-off timer function and four change-over contacts. The delay time is adjustable with a lockable knob (either delay-on or delay-off, the other delay is fixed). The relay can also be supplied with fixed time delays (no knob). The pull-in voltage and drop-out voltage are both adjustable via internal screws. The relay can also be supplied with a fixed pull-in and drop-out voltage. Suitable for monitoring DC voltages.

- Compact plug-in design
- DC voltage monitoring relay with time delay, 4 C/O contacts
- Pull-in and drop-out voltage adjustable via internal screws
- Time delay on pull-in and/or drop-out
- 1 delay time adjustable with a lockable knob, other delay time fixed
- Also available with fixed time delays (no knob)
- Time delay range: 0 ... 60 s
- No auxiliary supply necessary
- 1 LED for status indication
- Magnetic arc blow-out
- Flat, square and silver plated relay pins for excellent socket connection
- Integrated snap lock

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- AgSnO2 non-weldable contact
- No magnetic arc blow-out
- Double zener diode
- Double make/double break contacts

Time delay

Time delay function		**Delay on pull-in and/or delay on drop-out**		
Available time ranges	**Fixed**	**Any value between 0...60 s**		
	Adjustable (xx)	**0.3...3 s**	**0.6...6 s**	**1...10 s**
		3...30 s	6...60 s	

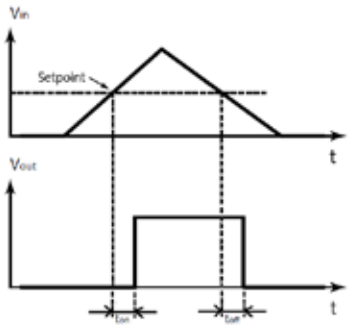
Contact data

Number and type of contacts	4 C/O
Maximum make current	16 A
Maximum continuous current	10 A
Maximum switching voltage	250 VDC, 440 VAC
Minimum switching voltage	12 V **(5 V with gold plated contacts)**
Minimum switching current	10 mA **(1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag
Maximum switching capacity and electrical life expectancy	**See curves on page 57**

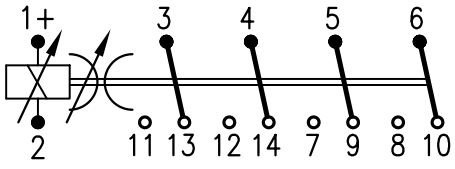
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	190 g (with adjustable knob)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Uadjust min (VDC)	Uadjust max (VDC)
MTDV4-U201	24	19.2	30
MTDV4-U207	36	28.8	45
MTDV4-U202	48	38.4	60

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

UMD-U300

Voltage monitoring, AC input, 6 A, 1 C/O + 1 N/O

Plug-in electronic voltage monitoring railway relay with 1 change-over contact and 1 normally open contact, suitable for AC voltages with a frequency of 50/60 Hz. The UMD-U300 offes a very small hysteresis and does not need auxiliary supply.

- Compact plug-in design
- Voltage monitoring relay, 1 C/O contact + 1 N/O contact
- AC input
- Very small hysteresis
- No auxiliary supply necessary
- Pull-in voltage adustable with a lockable knob
- Two LEDs for status indication
- Weld-no-transfer contacts
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Special dust protection

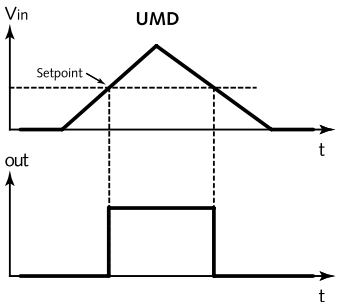
Contact data

Amount and type of contacts	**1 C/O + 1 N/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag**
Mechanical swithcing cpacity and electrical life expectancy	**See curves on page 133**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	130 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Timing diagram

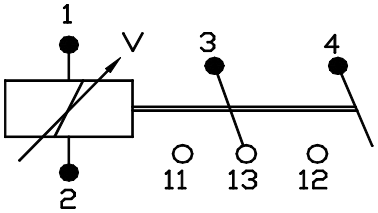


Nominal voltage

Type	Unom (VDC)	Uadjust. min (VDC)	Uadjust. max (VDC)	Power (VA)
UMD-U316	150	115	185	< 1.5
UMD-U319	100	55	120	< 1.3

Other types on request

Connection diagram



Dimensions See page 56
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

FDA-U200

Flashing symmetrical, 8 A, 2 C/O

Plug-in electronic pulsing railway relay with 2 change-over contacts. When the relay is activated the coil starts with an interval. The pulse time and interval time are equal.

- Compact plug-in design
- Flashing relay (symmetrical), 2 C/O contacts
- Delay time adjustable with lockable knob
- Duty cycle: 1/2
- Double zener diode coil protection
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Extra dust protection

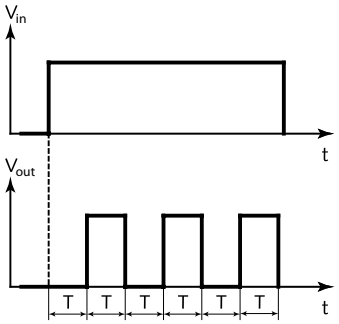
Pulse specifications

Pulse function	**Flashing (symmetrical); duty cycle 1/2**
Pulse rate (xx)	**20...60 imp/min adjustable per lockable knob** **40...120 imp/min adjustable per lockable knob** **Fixed without knob (set in factory)**

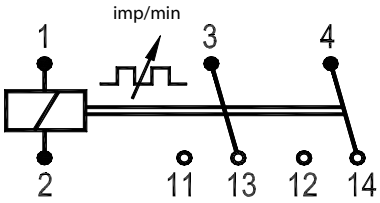
Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	**AgCdO**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	20 x 10^6 operations
Weight	90 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
FDA-U201	24	16.8	30
FDA-U202	48	33.6	60
FDA-U203	72	50.4	90
FDA-U204	110	77.0	138
FDA-U205	96	67.2	120
FDA-U207	36	25.2	45

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

FDA-U300

Flashing symmetrical, AC input, 8 A, 2 C/O

Plug-in electronic pulsing railway relay with 2 change-over contacts, suitable for AC coil voltages with a frequency of 50/60 Hz. When the relay is activated the coil starts with an interval. The pulse time and interval time are equal.

- Compact plug-in design
- Flashing relay (symmetrical), 2 C/O contacts
- AC input
- Delay time adjustable with lockable knob
- Duty cycle: 1/2
- Double zener diode coil protection
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Extra dust protection

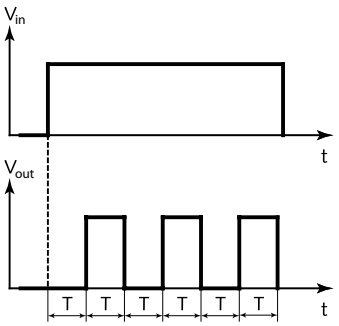
Pulse specifications

Pulse function	**Flashing (symmetrical); duty cycle 1/2**
Pulse rate (xx)	**20...60 imp/min adjustable per lockable knob** **40...120 imp/min adjustable per lockable knob** **Fixed without knob (set in factory)**

Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	**AgCdO**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Timing diagram



Mechanical & environmental characteristics

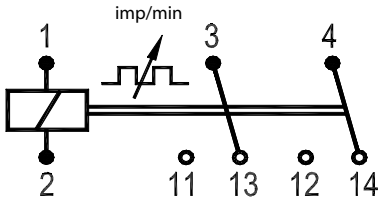
Mechanical life	20 x 10^6 operations
Weight	90 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
FDA-U301	24	19.2	28.8
FDA-U303	220	176	264
FDA-U305	110	88	132

Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

FDA4-U200

Flashing symmetrical, 10 A, 4 C/O

Plug-in electronic railway relay with 4 change-over contacts. When the relay is activated the coil starts with an interval. The pulse time and interval time are equal.

- Compact plug-in design
- Flashing relay (symmetrical), 4 C/O contacts
- Duty cycle: 1/2
- Fixed pulse rate
- Also available with adjustable pulse rate (with knob)
- Two LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non weldable contacts
- No magnetic are blow-out
- Double zener diode over coil
- Double make / double break

Pulse specifications

Pulse function	**Flashing (symmetrical); duty cycle 1/2**
Pulse rate (xx)	**Selectable between 300 imp/min and 1/60 imp/min**
Adjustable pulse time	**On request**

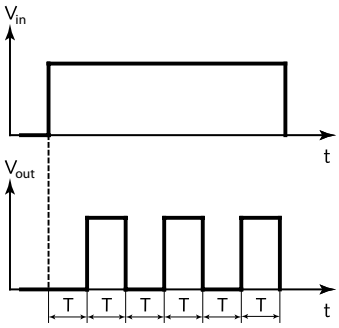
Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	100 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Timing diagram

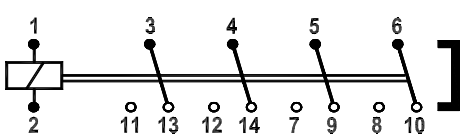


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
FDA4-U201	24	16.8	30
FDA4-U202	48	33.6	60
FDA4-U203	72	50.4	90
FDA4-U204	110	77.0	138
FDA4-U205	96	67.2	120
FDA4-U207	36	25.2	45

Other types on request

Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

FDC-U200

Flashing asymmetrical, 6 A, 2 C/O, 2 pole

Plug-in electronic pulsing railway relay with 2 change-over contacts. When the relay is activated the coil is energised with a pulse. The pulse time and interval time are fixed (standard on 1 second and 30 seconds).

- Compact plug-in design
- Flashing relay (asymmetrical), 2 C/O contacts
- Fixed pulse and interval time
- Standard pulse 1 s / interval 30 s
- Weld-no-transfer contacts
- Transparant cover
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Time delay specifications

Time delay function	**Flashing (asymmetrical)**
Standard pulse time	**1 s**
Standard interval time	**30 s**
Other times	**On request**

Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	**Ag**
Maximum switching capacity and electrical life expectancy	**See curves on page 133**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	105 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Nominal voltage

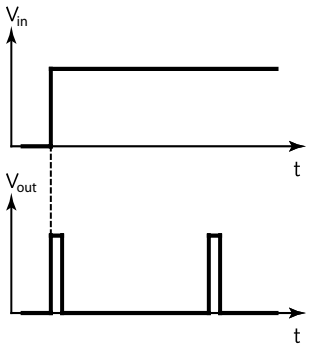
Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
FDC-U201	24	16.8	30
FDC-U202	48	33.6	60
FDC-U203	72	50.4	90
FDC-U204	110	77.0	138
FDC-U205	96	67.2	120
FDC-U206	12	8.4	15
FDC-U207	36	25.2	45

Other types on request

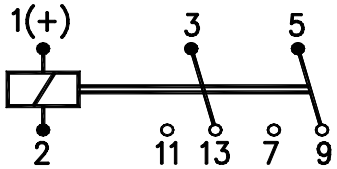
Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Special dust protection

Timing diagram



Connection diagram



Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

FDC4-U200

Flashing asymmetrical, 10 A, 4 C/O

Plug-in electronic railway flashing timer relay with four change-over contacts. When the relay is activated the coil is energized with a pulse. The pulse time is adjustable with a lockable knob. The relay can also be supplied with a fixed pulse time (no knob).

- Compact plug-in design
- Flashing relay (asymmetrical), 4 C/O contacts
- Pulse time adjustable with a lockable knob
- Also available with fixed pulse time
- Pulse time and cycle time between 0 s...60 min
- Magnetic arc blow-out
- Two LEDs for status indication
- Flat, square and silver plated relay pins for excellent socket connection
- Wide range sockets
- Integrated snap-lock
- Transparent cover
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non-weldable contact
- No magnetic arc blow-out
- Double zener diode
- Double make/double break contacts

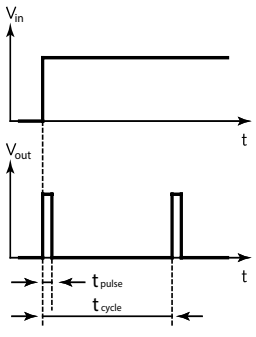
Pulse specifications

Pulse function	**Flashing (asymmetrical)**
Fixed cycle time	**Factory set between 0 s...60 min**
Adjustable pulse time	**Adjustable between 0 s...cycle time**
Fixed pulse time (factory)	**Factory set between 0 s...cycle time**

Contact data

Number and type of contacts	4 C/O
Maximum make current	16 A
Maximum continuous current	10 A
Maximum switching voltage	250 VDC, 440 VAC
Minimum switching voltage	12 V
Minimum switching current	10 mA
Maximum contact resistance	**15 mΩ**
Material	**Ag standard**
Maximum switching capacity and electrical life expectancy	**See curves on page 57**

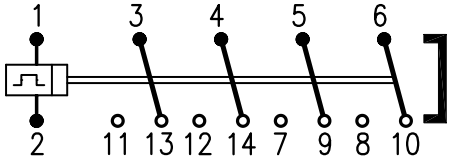
Timing diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	190 g (with adjustable knob)
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)
FDC4-U201-xx	24	16.8	30	2.4
FDC4-U202-xx	48	33.6	60	4.8
FDC4-U203-xx	72	50.4	90	7.2

Other types on request

Dimensions See page 55
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

FDG-U200

Flashing symmetrical, counterphase, 2 pole

Electronic railway pulsing relay with 2 solid state contacts in counterphase.
The pulse time and interval time are equal.

- Compact plug-in design
- Flashing relay (symmetrical), 1 N/O and 1 N/C contacts
- Fixed pulse and interval time
- Solid state contacts in counterphase
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets

Options

On request

Pulse specifications

Pulse function	**Flashing (symmetrical): duty cycle 1/2**
Pulsing frequency	**30 / 60 / 90 / 120 per minute (other times on request)**

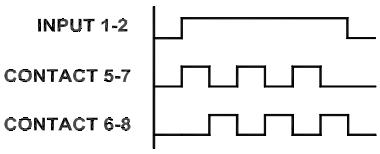
Contact data

Amount and type of contacts	**1 N/O + 1 N/C solid state**
Maximum switching capacity	**2 lamps of 84 W**

Mechanical & environmental characteristics

Mechanical life	20 x 10^6 operations
Weight	105 g
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Timing diagram

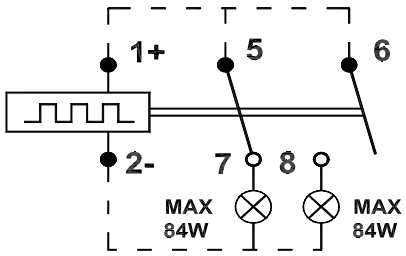


Nominal voltage

Type	U_{nom} (VDC)	U_{min} (VDC)	U_{max} (VDC)
U201	24	16.8	30

Other types on request

Connection diagram



Dimensions See page 56
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

WDE4-U200

10 A, 4 C/O

Plug-in electronic one-shot time railway relay with 4 change-over contacts.
When the relay is activated the coil is energized with 1 pulse.

- Compact plug-in design
- One shot time relay, 4 C/O contacts
- Adjustable pulse time
- Also available with fixed pulse time (no knob)
- Magnetic arc blow-out
- Two LEDs for status indication
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non-weldable contacts
- No magnetic arc blow-out
- Double zener diode over input
- Double make / double break

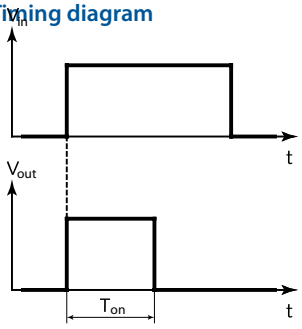
Time delay specifications

Time delay function	**One-shot**		
Adjustable pulse time ranges (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3...30 min	**6...60 min**	

Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

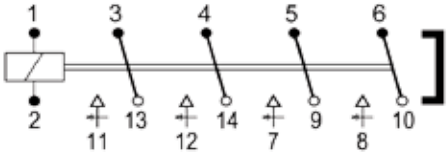
Timing diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	170 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
WDE4-U201	24	16.8	30
WDE4-U202	48	33.6	60
WDE4-U203	72	50.4	90
WDE4-U204	110	77.0	138
WDE4-U205	96	67.2	120
WDE4-U207	36	25.2	45

Other types on request

Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

WDE4-U300

AC input, 10 A, 4 C/O

Plug-in electronic one-shot time railway relay with 4 change-over contacts, suitable for AC input voltages with a frequency of 50/60 Hz. When the relay is activated the coil is energized with 1 pulse.

- Compact plug-in design
- One shot time relay, 4 C/O contacts
- AC input
- Adjustable pulse time
- Also available with fixed pulse time (no knob)
- Magnetic arc blow-out
- Two LEDs for status indication
- Integrated snap-lock
- Optional positive mechanical keying relay to socket

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non-weldable contacts
- No magnetic arc blow-out

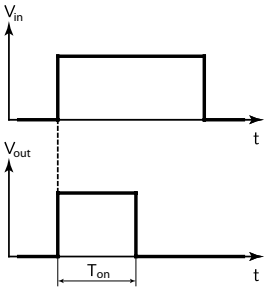
Time delay specifications

Time delay function	**One-shot**		
Adjustable pulse time ranges (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3...30 min	**6...60 min**	

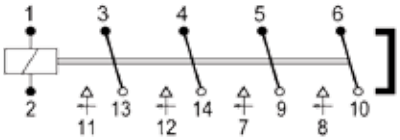
Contact data

Amount and type of contacts	**4 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A (1 mA with gold plated contacts)**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard**
Electrical life expectancy	**See curves on page 57**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	170 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Nominal voltage

Type	Unom (VAC)	Hz	Umin (VAC)	Umax (VAC)
WDE4-U301	24	50	19.2	28.8
WDE4-U302	220	50	176	264
WDE4-U303	110	50	88	132
WDE4-U304	120	50	96	144
WDE4-U305	110	60	88	132
WDE4-U307	115	60	92	138

Other types on request

Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

PDF3-U200

10 A, 4 C/O

Plug-in electronic one-shot railway relay with 3 change-over contacts. The relay is activated by the negative going edge of a DC voltage on the input terminals.

- Compact plug-in design
- One shot relay, 3 C/O contacts
- Activated by negative going edge of DC voltage on input terminals (with auxiliary supply)
- Fixed pulse time
- Two LEDs for status indication
- Magnetic arc blow-out
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Gold plated contacts
- Extra dust protection
- $AgSnO_2$ non weldable contacts
- No magnetic arc blow-out

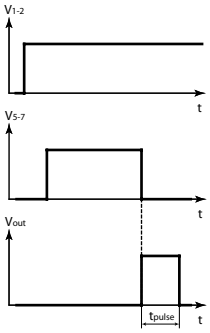
Time delay specifications

Time delay function	**One-shot**
Fixed pulse time	**3 s (other pulse times on request)**

Contact data

Amount and type of contacts	**3 C/O**
Maximum make current	**16 A**
Peak inrush current	**200 A (withstand > 10 x 200 A @ 10 ms, 1 min)**
Maximum continuous current	**10 A (1 mA with gold plated contacts)**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag**
Electrical life expectancy	**See curves on page 57**

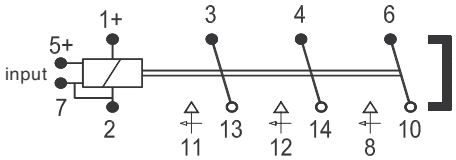
Timing diagram



Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	176 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	90 %

Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
PDF3-U201	24	16.8	30
PDF3-U202	48	33.6	60
PDF3-U203	72	50.4	90
PDF3-U204	110	77.0	138
PDF3-U205	96	67.2	120
PDF3-U207	36	25.2	45

Other types on request

Dimensions See page 56
Mounting possibilities & sockets See page 59
Detailed information and datasheets available on www.morssmitt.com

WDDE-U200

8 A, 2 C/O instantaneous + 2 C/O one-shot

Plug-in electronic one-shot time railway relay with 2 instantaneous change-over and 2 one-shot change-over contacts. When the relay is activated the one-shot change-over contacts are activated with 1 pulse.

- Compact plug-in design
- One-shot time and instantaneous relay, 2 C/O instantaneous contacts and 2 C/O one-shot contacts
- Pulse time adjustable with a lockable knob or fixed pulse time (no knob)
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Two LEDs for status indication
- Wide range of sockets available

Options

- Low temperature (-40 °C)
- Double zener diode over input

Time delay specifications

Time delay function	**Instantaneous and one-shot**
Available pulse times	**0.1 s...60 min**

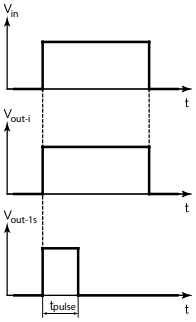
Contact data

Amount and type of contacts	**2 C/O instantaneous and 2 C/O time delay**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	**AgNi + 0.15 µm Au**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Mechanical & environmental characteristics

Mechanical life	20 x 10^6 operations
Operating temperature	-25 °C...+70 °C
Humidity	**80 %**

Timing diagram

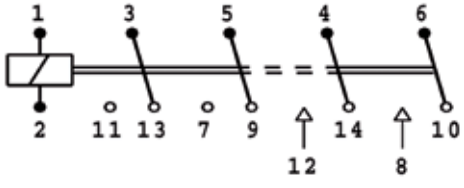


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
WDDE-U201	24	16.8	30
WDDE-U202	48	33.6	60
WDDE-U203	72	50.4	90
WDDE-U204	110	77.0	138
WDDE-U205	96	67.2	120
WDDE-U207	36	25.2	45
WDDE-U208	55	38.5	69
WDDE-U209	64	44.8	80

Other types on request

Connection diagram



Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

WDDE-U300

8 A, AC input, 2 C/O instantaneous + 2 C/O one-shot

(WDDE-U200 shown)

Plug-in electronic one-shot time railway relay with 2 instantaneous change-over and 2 one-shot change-over contacts, suitable for AC coil voltages with a frequency of 50 Hz. When the relay is activated the one-shot change-over contacts are activated with1 pulse.

- Compact plug-in design
- One shot time and instantaneous relay, 2 C/O instantaneous contacts and 2 C/O one-shot contacts
- Pulse time adjustable with a lockable knob or fixed pulse time (no knob)
- Integrated snap-lock
- Optional positive mechanical keying relay to socket
- Two LEDs for status indication
- Wide range of sockets available

Options

- Low temperature (-40 °C)

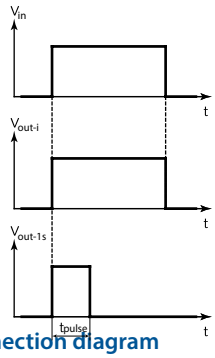
Time delay specifications

Time delay function	**Instantaneous and one-shot**
Available pulse times	**0.1 s...60 min**

Contact data

Amount and type of contacts	**2 C/O instantaneous and 2 C/O time delay**
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	**AgNi + 0.15 µm Au**
Maximum switching capacity and electrical life expectancy	**See curves on page 58**

Timing diagram



Mechanical & environmental characteristics

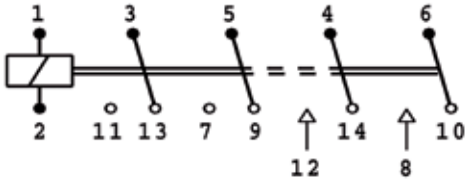
Mechanical life	20 x 10^6 operations
Weight	112 g (without options)
Operating temperature	-25 °C...+70 °C
Humidity	**80 %**

Nominal voltage

Type	Unom (VAC)	Umin (VAC)	Umax (VAC)
WDDE-U306	240, 50 Hz	190	288

Other types on request

Connection diagram



Dimensions See page 56
Mounting possibilities & sockets See page 59

Detailed information and datasheets available on www.morssmitt.com

Example ordering scheme D-platform

Each relay has its own ordering scheme. In this scheme all available possibilities for this relay is mentioned and can be selected. On www.morssmitt.com all datasheets for all relays are available.

Example: D-U303-C relay

D-U3	03	-	C
1. Relay model	2. Coil voltage		3. Options

This example represents a **D-U303-C**
Description: D-U300 relay, Unom: 220 VAC, low temperature (-40 °C)

1. Relay model

D-U3

2. Coil voltages

01	24 VAC / 50 Hz
03	220 VAC / 50 Hz
05	110 VAC / 50 Hz
07	380 VAC / 50 Hz
08	120 VAC / 60 Hz
09	110 VAC / 60 Hz
10	220 VAC / 60 Hz
13	230 VAC / 50 Hz
14	254 VAC / 60 Hz
15	440 VAC / 60 Hz
17	400 VAC / 60 Hz
18	288 VAC / 50 Hz
20	380 VAC / 60 Hz

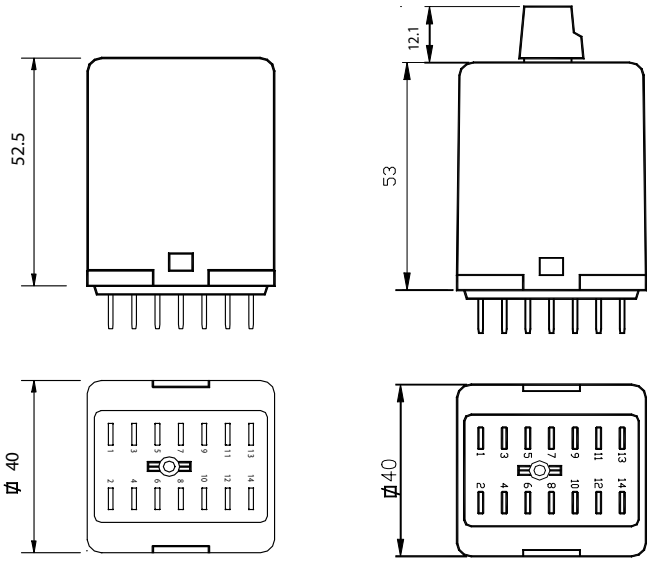
3. Options

C	Low temp. (-40 °C) - Max. contact current 8 A
E	Gold plated contacts
K	Special dust protection
L	LED coil indicator
M	$AgSnO_2$ contacts, highly resistant to welding
N	No magnetic arc blow-out
T	Push-to-test-button
Y	Double make / double break (-40 °C)

Dimensions

Dimensions (mm)
for relay type:

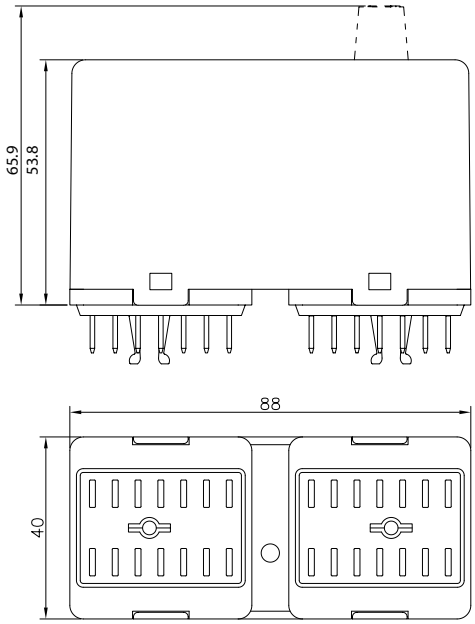
- BD-U200
- DGG-U200
- DI-U900
- D-U200
- D-U300
- FDA-U200
- FDA-U300
- FDC-U200
- TDB2-U200



without knob | with knob

Dimensions (mm)
for relay type:

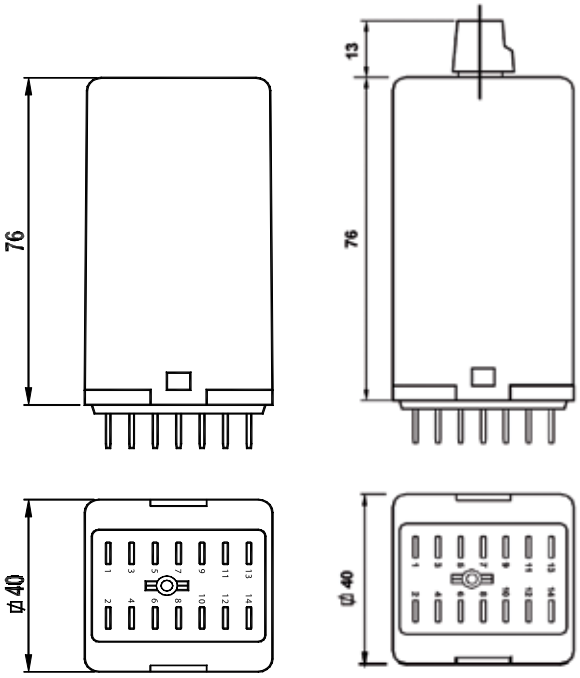
- D8-U200
- KDN-U200
- TDD4B2-U200



Dimensions

Dimensions (mm)
for relay type:

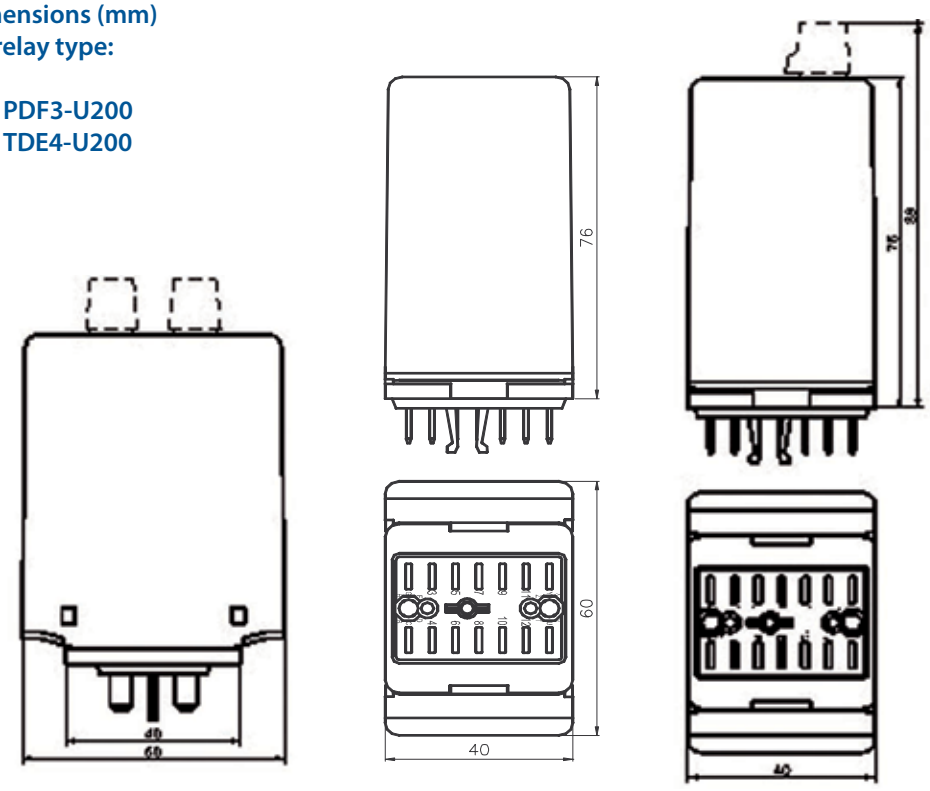
- CTD4-U
- FDA4-U200
- FDC4-U200
- FDG-U200
- KCD-U200
- MTDV4-U200
- TDB4-U200
- TDBE-U200
- TDBE4-U200
- TDBE4-U300
- TDDB-U200
- TDDB-U300
- TDE3-U200
- TDE4N-U
- TDE-U200
- UMD-U200
- UMD-U300
- WDDE-U200
- WDDE-U300
- WDE4-U200
- WDE4-U300



without knob | with knob

Dimensions (mm)
for relay type:

- PDF3-U200
- TDE4-U200



without knob | with knob

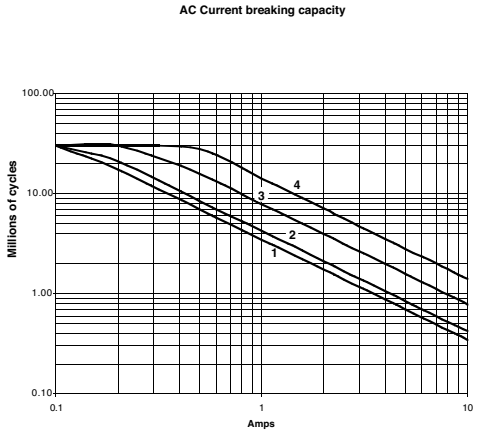
SERVING SAFETY

D-platform curves 1

AC current breaking capacity at cos φ = 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (Power Factor = 1).

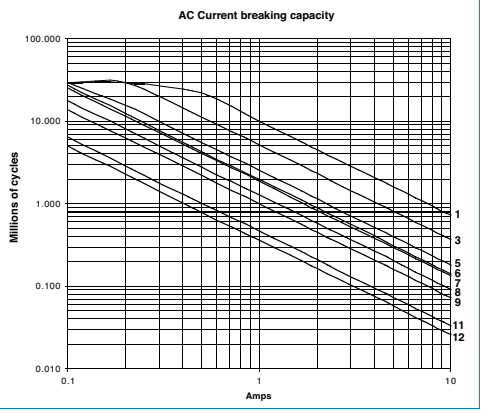
Curve	1	2	3	4
VAC	220	125	48	24



AC current breaking capacity at cos φ = 0.7 ; 0.5 ; 0.3

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads -
——— Cos Ø = 0.7
– – – – Cos Ø = 0.5
—·— Cos Ø = 0.3

Curves	1	3	5	6	7	8	9	11	12
VAC	24	24	125	220	24	125	220	125	220
Cos Ø	0.7	0.5	0.7	0.7	0.3	0.5	0.5	0.3	0.3

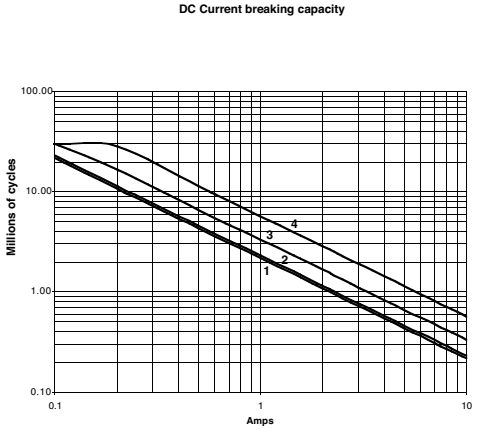


DC current breaking capacity at L/R = 0

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, we increase the DC current breaking capacity by 50%

Curve	1	2	3	4
VDC	220	125	48	24

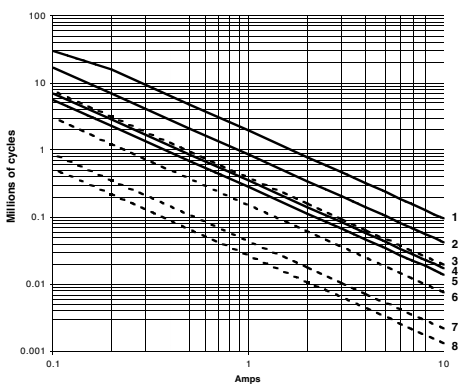


DC current breaking capacity L/R = 20 ms ; 40 ms

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load -
——— L/R = 20 ms continuous current
— – – – L/R = 40 ms continuous current

* By connecting 2 contacts in series, we increase the DC current breaking capacity by 50%

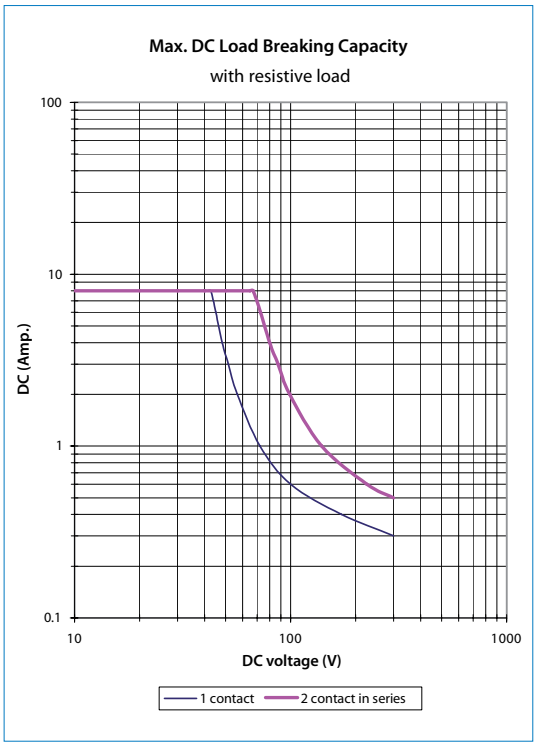
Curves	1	2	3	4	5	6	7	8
VDC	24	48	24	125	220	48	125	220
L/R (ms)	20	20	40	20	20	40	40	40



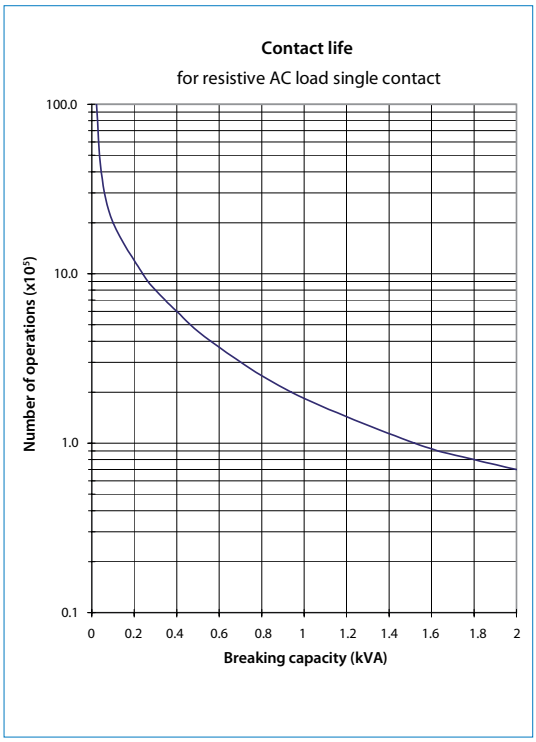
Electrical life expectancy

D-platform curves 2

Maximum breaking capacity



Contact life



SERVING SAFETY

D-platform sockets

V3

V22BR

V23

V23BR

V26

V29

V31

V32

V33

Mounting possibilities 4-pole relays

The relay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

Surface / wall mounting

V22BR	Screw socket, front connection (9 mm terminals)
V23	Screw socket, front connection (7.5 mm terminals)
V29	Spring clamp socket, front dual connection (2.5 mm²)

Rail mounting

V23	Screw socket, front connection (7.5 mm terminals)
V23BR	Screw socket, front connection (9 mm terminals)
V29	Spring clamp socket, front dual connection (2.5 mm²)

Panel / flush mounting

V3	Solder tag socket, panel mount, rear connection
V26	Crimp contact socket, panel mount, rear connection, A260 crimp contact
V31	Faston connection socket, rear dual connection (4.8 x 0.8 mm)
V33	Spring clamp socket, flush mount, rear dual connection (2.5 mm²)

PCB-mounting

V32	PCB-soldering socket

Suitable for

- BD-U200
- CTD4-U
- DGG-U200
- DI-U900
- D-U200
- D-U300
- FDA4-U200
- FDA-U200
- FDA-U300
- FDC-U200
- FDC4-U200
- FDG-U200
- KCD-U200
- MTDV4-U200
- PDF3-U200
- TDB2-U200
- TDB4-U200
- TDBE-U200
- TDBE4-U200
- TDBE4-U300
- TDDB-U200
- TDDB-300
- TDE3-U200
- TDE4-U200
- TDE4N-U
- TDE-U200
- UMD-U300
- WDDE-U200
- WDDE-U300
- WDE4-U200
- WDE4-U300

Detailed information and datasheets available on www.morssmitt.com

D-platform sockets

V88

V89

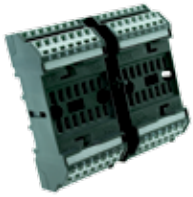
V92BR

V93

V93BR

V96

V97



V99

2x V32

Mounting possibilities 8-pole relays

The relay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

Surface / wall mounting

V92BR	Screw socket, front connection (9 mm terminals)
V93	Screw socket, front connection (7.5 mm terminals)
V99	Spring clamp socket, front dual connection (2.5 mm^2)

Rail mounting

V93	Screw socket, front connection (7.5 mm terminals)
V93BR	Screw socket, front connection (9 mm terminals)
V99	Spring clamp socket, front dual connection (2.5 mm^2)

Panel / flush mounting

V88	Springclamp socket, flush mount, rear dual connection (2.5 mm^2)
V89	Faston connection socket, rear dual connection (4.8 x 0.8 mm)
V96	Solder tag socket, panel mount, rear connection
V97	Crimp contact socket, panel mount, rear connection, A260 crimp contact

PCB-mounting

For PCB-mounting use 2x V32 according pin lay-out

Suitable for

- D8-U200
- KDN-U200
- TDD4B2-U200

Detailed information and datasheets available on www.morssmitt.com

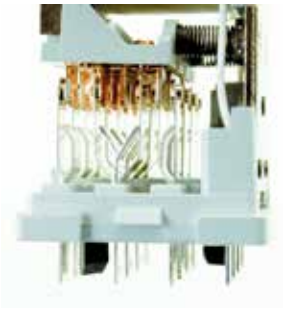
SERVING SAFETY

A- / B-platform

Heavy duty multi functional relays with very long mechanical contact life of 100 million cycles. With 4 change-over contacts these relays all have the same base of 45 x 45 mm.

B-relays with higher continuous contact load and higher relay cover than A-relays. Different types available for many different applications.

Design features



Plug-in design

Wide range of sockets for front or rear mounting and connection types.

Self cleaning contacts

Silver tin oxide option, resist to welding for inductive or capacitive loads and safety-critical applications.

Weld-no-transfer contacts

Safety design counter blade system. Relay always stays in a logic configuration. For safety-critical applications.

Cover

Transparent cover for visual check. Clear indication of type and contact arrangement.

Double make / break

Double arc extinction for high inductive or capacitive loads. Increasing electrical life. For safety-critical applications

Cupro nickel 'air gap'

To prevent magnetic sticking of mobile armature to coil.

Contacts

Gold contacts or combined silver and bifurcated gold contacts for dry circuit applications

Flexible coupling

No friction of mobile armature, extends mechanical life to 100 million operations.

Double coil terminal

To facilitate and reduce wiring

Coding keys

To prevent mount and replacement error.

Special insulation design

To extend electrical life

Options

C	Weld-no-transfer	Contacts are mechanically connected in such a way that N/C contacts and N/O contacts can never be closed at the same time. - If a N/O contact fails to open and the relay de-energises, none of the N/C contacts closes - If a NC contact fails to open and the relay energises, none of the NO contacts closes
G	Goldplated contacts	Silver contacts with thin layer of gold to have a good resistance against corrosive atmospheres. Suitable for switching low currents and low voltages.
AM / BM	Gold bifurcated and silver contacts	Three silver contacts and one bifurcated gold contact. The bifurcated contact is a two-contact finger design (contacts are in parallel) with wiping action to assure both lowest contact resistance and endurance.
V	LED indicator	Built-in LED(s) to indicate the presence of power supply and the energizing of the coil.
P	Back EMF protection diode	Diode to prevent the system against a back EMF surge when the relay coil is de-energized.
S	Double zener coil protection diode	Transient voltage suppressor to protect the relay coil against surges and to protect the system against a back EMF surge when the relay coil is de-energized.
Key-ing	Mechanical keying relays to socket	Positive mechanical keying relays to socket to prevent a relay being inserted in a wrong socket.
L	Manual reset control lever	Lever to actuate the latching relay from one position to the other position.

A 400

Heavy duty, 8 A, 4 C/O

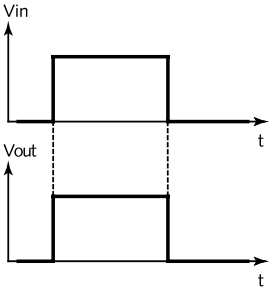
Plug-in railway relay with 4 double make / double break C/O contacts.

- Plug-in design
- Instantaneous relay
- 4 double make / double break C/O contacts (form Z)
- Optional weld-no-transfer contacts for safety critical applications
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

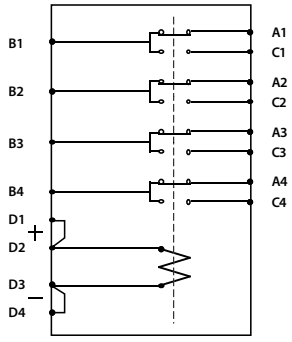
Options

- Transil coil protection
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
ME	12	8 / 16	3	6.25	1.25	48	30
AG	24	16 / 33	3	13.5	2.5	185	30
FL	36	25 / 45	3	21	3.5	430	30
DG	48	33 / 60	3	28.5	4.5	750	30
BG	72	48 / 90	3	40.5	6.5	1700	30
US	96	65 / 120	3	50	9	3000	30
SV	110	75 / 138	3	62	10	4000	30
EG	125	88 / 156	3	73	12	5700	30

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
SZ	115	80 / 140	3	65	10	4000	30
CG	220	176 / 242	3	129	21	15000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116
Detailed information and datasheets available on www.morssmitt.com

AG 400

Gold plated, 5 A, 4 C/O

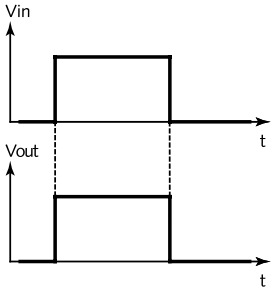
Plug-in railway relay with 4 double make / double break C/O contacts. The contacts are gold plated on hard silver.

- Plug-in design
- Instantaneous relay
- 4 double make / double break C/O contacts (form Z), gold plated on silver
- Weld-no-transfer function optional
- Contacts cross pollution barrier
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

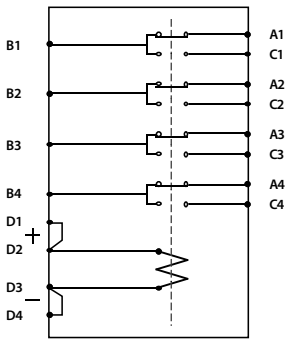
Options

- Transil coil protection (only with 400 type)
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Contact configuration	**4 C/O double break contacts**
Contact design	**Stationary contacts: 2 single contacts (contacts in series)** **Movable contacts: solid blade**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC** **Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**10 mA at 12 VDC**
Contact material	**Stationary contacts: Gold plated over hard silver** **Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
AG	24	16 / 33	3	13.5	2.5	185	30
FL	36	25 / 45	3	21	3.5	430	30
DG	48	33 / 60	3	28.5	4.5	750	30
BG	72	48 / 90	3	40.5	6.5	1700	30
SV	110	75 / 138	3	62	10	4000	30
EG	125	88 / 156	3	73	12	5700	30

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
SZ	115	80 / 140	3	65	10	4000	30
CG	220	176 / 242	3	129	21	15000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116
Detailed information and datasheets available on www.morssmitt.com

AK 400

Weld resistant, 8 A, 4 C/O

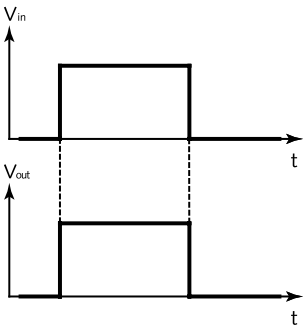
Plug-in railway relay with 4 double make / double break C/O contacts.

- Plug-in design
- Instantaneous relay
- 4 double make / double break C/O contacts (form Z)
- Weld resistant
- Optional weld-no-transfer contacts for safety critical applicaitons
- Contact life (mechanical) of 100 million cycles

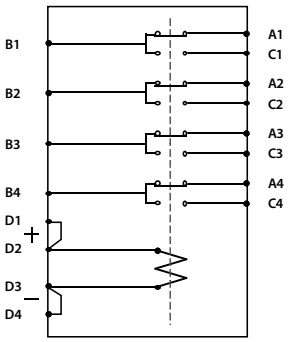
Options

- Transil coil protection (only with 400 type)
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 110 VDC & 100 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Y)**
Contact material	**Stationary contacts: tin silver oxide (10 %) Movable contacts: hard silver overlay laminated to copper**
Electrical life expectancy	**See curves on page 110**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
AG	24	16 / 33	3	13.5	2.5	185	30
FL	36	25 / 45	3	21	3.5	430	30
DG	48	33 / 60	3	28.5	4.5	750	30
BG	72	48 / 90	3	40.5	6.5	1700	30
US	96	65 / 120	3	50	9	3000	30
SV	110	75 / 138	3	62	10	4000	30
EG	125	88 / 156	3	73	12	5700	30

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) (ms)
SZ	115	80 / 140	3	65	10	4000	30
CG	220	176 / 242	3	129	21	15000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116
Detailed information and datasheets available on www.morssmitt.com

AM 400

Mixed load, 8 A, 4 C/O

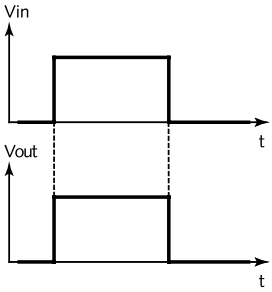
Plug-in railway relay with 3 silver double make / double break C/O and 1 gold bifurcated C/O contact.

- Plug-in design
- Instantaneous relay
- 3 double make / double break C/O contacts (form Z) + 1 gold bifurcated C/O contact
- Weld-no-transfer contact for silver contacts optional
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

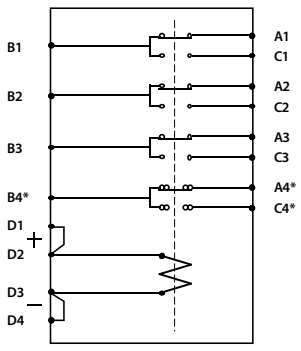
Options

- Transil coil protection
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data - silver contacts

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**3 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Contact data - gold bifurcated contact

Number of contacts	**1 C/O double break contact**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**1 mA at 5 VDC**
Contact material	**Stationary contacts: Solid gold alloy Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**2 x 10^6 operations**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
AGZ	24	16 / 33	3	13.5	2.5	185	30
FLZ	36	25 / 45	3	21	3.5	430	30
DGZ	48	33 / 60	3	28.5	4.5	750	30

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
SZZ	115	80 / 140	3	65	10	4000	30
CGZ	220	176 / 242	3	129	21	15000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116

Detailed information and datasheets available on www.morssmitt.com

B 400

Safety-critical, heavy duty, 12 A, 4 C/O

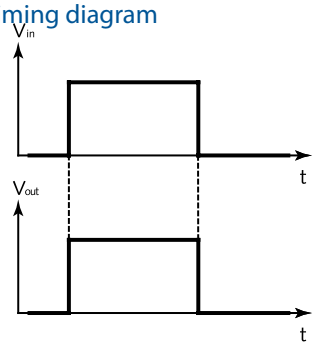
Safety-critical and heavy duty railway relay with 4 double make / double break C/O contacts.

- Plug-in design
- Instantaneous, safety-critical relay
- 4 double make / double break C/O contacts (form Z)
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

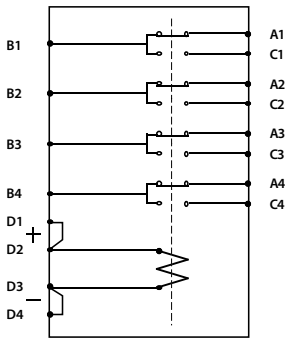
Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
ME	12	8 / 16	3.5	6.25	1.25	40	40
AG	24	16 / 33	3.5	13.5	2.5	170	40
FL	36	25 / 45	3.5	21	3.5	390	40
DG	48	33 / 60	3.5	28.5	4.5	625	40
BG	72	48 / 90	3.5	40.5	6.5	1600	40
US	96	65 / 120	3.8	50	9	2400	40
EG	115	77 / 144	3.5	60	11.5	4000	40
FG	550	400 / 660	4	300	50	75500	40
UT	700	450 / 900	4.2	380	60	115000	40

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
EM	127	88 / 143	4	71.5	12	4000	40
CG	220	176 / 242	3	129	21	14350	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

BG 400

Gold plated, 5 A, 4 C/O

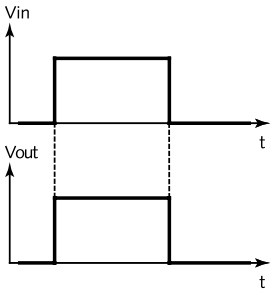
Plug-in railway relay with 4 double make / double break C/O contacts. The contacts are gold plated on hard silver.

- Plug-in design
- Instantaneous relay
- 4 double make / double break C/O contacts (form Z), gold plated on silver
- Weld-no-transfer function optional
- Contacts cross pollution barrier
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

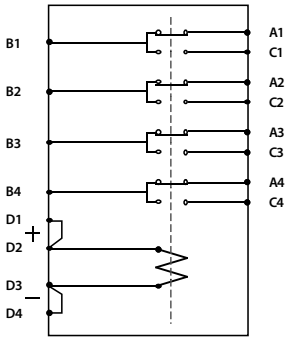
Options

- Transil coil protection
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Contact configuration	**4 C/O double break contact**
Contact design	**Stationary contacts: 2 single contacts (contacts in series)** **Movable contacts: solid blade**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC** **Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**10 mA at 12 VDC**
Contact material	**Stationary contacts: Gold plated over hard silver** **Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
ME	12	8 / 16	3.5	6.25	1.25	40	40
AG	24	16 / 33	3.5	13.5	2.5	170	40
FL	36	25 / 45	3.5	21	3.5	390	40
DG	48	33 / 60	3.5	28.5	4.5	625	40
BG	72	48 / 90	3.5	40.5	6.5	1600	40
US	96	65 / 120	3.8	50	9	2400	40
EG	115	77 / 144	3.5	60	11.5	4000	40
FG	550	440 / 660	4	300	50	75500	40
UT	700	450 / 900	4.2	380	60	115000	40

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
EM	127	88 / 143	4	71.5	12	4000	40
CG	220	176 / 242	3	129	21	14350	40

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

BK 400

Safety-critical, weld resistant, 12 A, 4 C/O

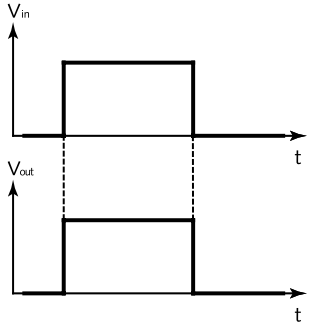
Safety-critical, heavy duty and weld resistant railway relay with 4 double make / double break C/O contacts.

- Plug-in design
- Instantaneous, safety-critical relay
- 4 double make / double break C/O contacts (form Z)
- Weld-no-transfer contacts standard
- Weld resistant
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

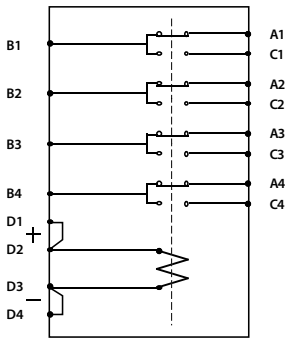
Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 110 VDC & 100 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Stationary contacts: tin silver oxide (10 %) Movable contacts: hard silver overlay laminated to copper**
Contact resistance - initial	**30 mΩ max at 5 A**
Contact resistance - end of life	**60 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 114**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
ME	12	8 / 16	3.5	6.25	1.25	40	40
AG	24	16 / 33	3.5	13.5	2.5	170	40
FL	36	25 / 45	3.5	21	3.5	390	40
DG	48	33 / 60	3.5	28.5	4.5	625	40
BG	72	48 / 90	3.5	40.5	6.5	1600	40
US	96	65 / 120	3.8	50	9	2400	40
EG	115	77 / 144	3.5	60	11.5	4000	40
FG	550	400 / 660	4	300	50	75500	40
UT	700	450 / 900	4.2	380	60	115000	40

Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
EM	127	88 / 143	4	71.5	12	4000	40
CG	220	176 / 242	3	129	21	15000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C
(2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

BM 400

Mixed load, 12 A, 4 C/O

Plug-in railway relay with 3 silver double make / double break C/O contacts and 1 gold bifurcated C/O contact.

- Plug-in design
- Instantaneous relay
- 3 double make / double break C/O silver contacts (form Z) & 1 gold bifurcated C/O contact
- Weld-no-transfer function for silver contacts
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Contact data - silver contacts

Maximum continuous current	**12 A**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**3 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Contact data - gold bifurcated contact

Number of contacts	**1 C/O double break contact**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC** **Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**1 mA at 12 VDC**
Contact material	**Stationary contacts: Solid gold alloy** **Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**2 x 10^6 operations**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
MEZ	12	8 / 16	3.5	6.25	1.25	40	40
AGZ	24	16 / 33	3.5	13.5	2.5	170	40
FLZ	36	25 / 45	3.5	21	3.5	390	40

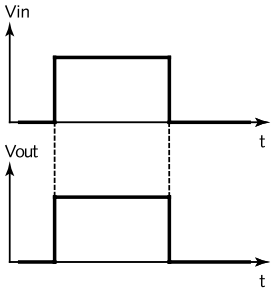
Keying	Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) ms)
EMZ	127	88 / 143	4	71.5	12	4000	40
CGZ	220	176 / 242	3	129	21	14350	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

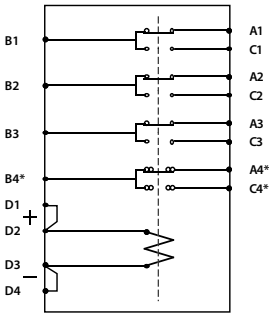
Options

- Transil coil protection
- Avalanche diode coil protection
- Weld-no-transfer
- LED coltage indicator
- Relay cover for wire locking spring

Timing diagram



Connection diagram (example)



VDC Models
(no Transil protection)

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

SB

Safety-critical, 8 A, 4 or 3 C/O

Latching, safety-critical railway relay with 2 stable magnetic latched states. When 1 coilis energized, the relay actuates from magnetical latched position 1 to 2. When the other coil is energized, the relay actuates back to position 1.

- Plug-in design
- Latching relay using 2 seperate coils and magnetic rocker mechanism
- Type 400 with 4 C/O contacts, of type 300 with 3 C/O contacts
- All contacts are double make / double break contacts (form Z)
- Weld-no-transfer contacts optional
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

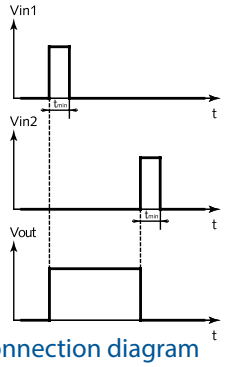
Options

- Transil coil protection (only with 400 type)
- Weld-no-transfer
- Manual reset control lever

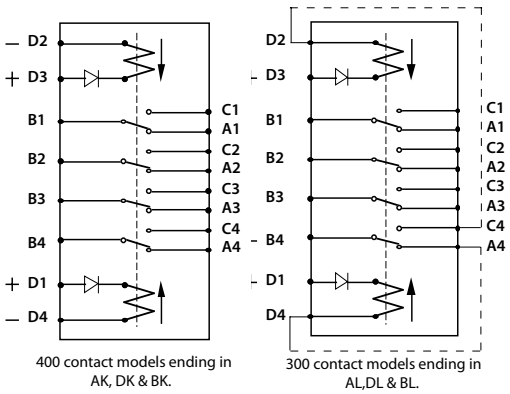
Contact data

Maximum continuous current	**8 A**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**Type 400: 4 double make / double break contacts (form Z)** **Type 300: 3 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Timing diagram



Connection diagram



400 contact models ending in AK, DK & BK.

300 contact models ending in AL,DL & BL.

Type 400: 4 double make / double break contacts (form Z)
Type 300: 3 double make / double break contacts (form Z)

The 4th contact is reserved for automatic coupling of the coils.

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Type 400

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
AK	24	18 / 33	3	185	30
CK	36	25 / 45	3	430	30
DK	48	33.5 / 60	3	750	30
BK	72	48 / 90	3	1700	30
SX	110	75 / 138	3	4000	30

50 ms min. pulse to permanent on (type 400 models only)

Type 300

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
AL	24	18 / 33	3	185	30
CL	36	25 / 45	3	430	30
DL	48	33.5 / 60	3	750	30
BL	72	48 / 90	3	1700	30
SY	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

TFBBU 400

Pull-in or drop-out mode, 12 A, 4 C/O

Pull-in or drop-out latching railway relay with four double make / double break C/O contacts. Relay is activated and de-activated by energizing or de-energizing relay. The contacts remain in the last powered position.

- Compact plug-in design
- Electronic latching (bistable) relay
- Transient pull-in or drop-out mode programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

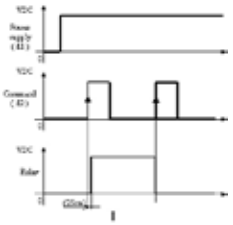
- Relay cover for wire locking spring

Contact data

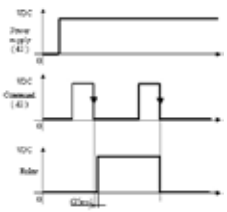
Maximum continuous current	**12 A**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Timing diagram

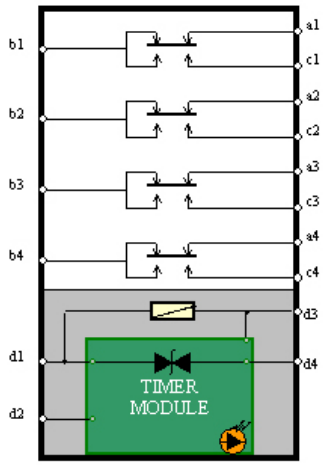
Flip flop relay:
transient pull-in mode



Flip flop relay:
transient drop-out mode



Connection diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GV	24	16 / 33	3	185	30
XX	36	25 / 43	3	475	30
XX	48	33 / 60	3	750	30
XX	72	48 / 90	3	1700	30
XX	96	65 / 120	3	3000	30
LS	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C
AC versions and other types on request

(2) Valid for closed relay

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

TBAA 400

Delay-on, 8 A, 4 C/O

Delay on pull-in railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on pull-in relay
- Fixed time delay < 10 s (set in factory)
- 4 double make / double break C/O contacts (form Z)
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in**
Total time delay range	**< 10 s**
Time delay adjustment	**Fixed (set in factory)**

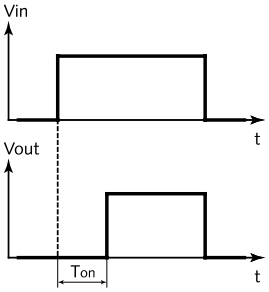
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

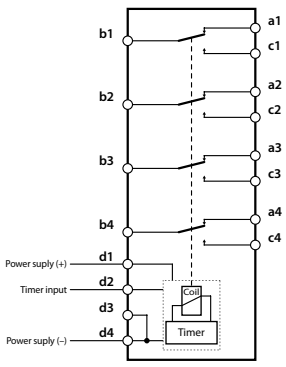


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GT	24	16 / 33	3	185	30
HT	36	25 / 43	3	475	30
JT	48	33 / 60	3	750	30
KT	72	48 / 90	3	1700	30
MT	96	65 / 120	3	3000	30
LT	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TBAR 400

Delay-off, 8 A, 4 C/O

Delay on drop-out railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on drop-out relay
- Fixed time delay < 10 s (set in factory)
- 4 double make / double break C/O contacts (form Z)
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out (with power supply)**
Total time delay range	**< 10 s**
Time delay adjustment	**Fixed (set in factory)**

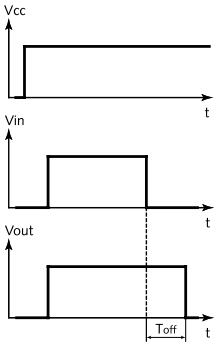
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

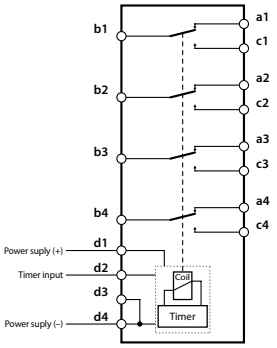
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GU	24	16 / 33	3	185	30
HU	36	25 / 43	3	475	30
JU	48	33 / 60	3	750	30
KU	72	48 / 90	3	1700	30
MU	96	65 / 120	3	3000	30
LU	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

TBAU 400

Delay-on or delay-off, 8 A, 4 C/O

Delay on pull-in or drop-out railway relay with four double make / double break C/O contacts.

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in or drop-out (selection by dip switch)**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

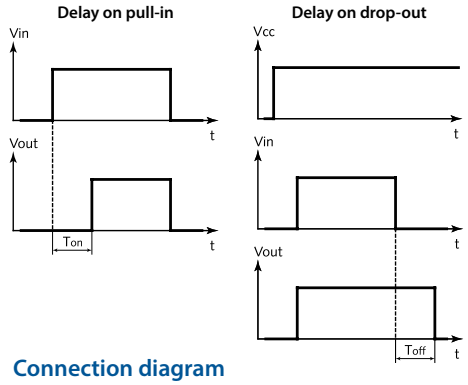
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

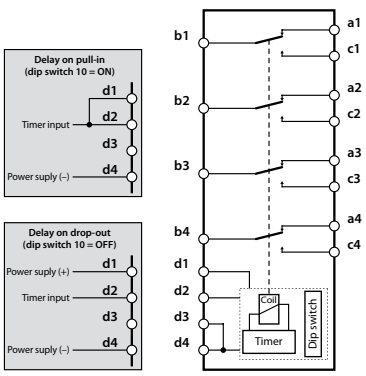
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GR	12	8 / 16	3	40	30
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C
AC versions and other types on request

(2) Valid for closed relay

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

TBLAU 400

Delay-on or delay-off, 8 A, 4 C/O, extended delay range

Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch up to 255 hours
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in or on drop-out (selection by dip switch)**
Total time delay range	**0.25 h...255 h**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

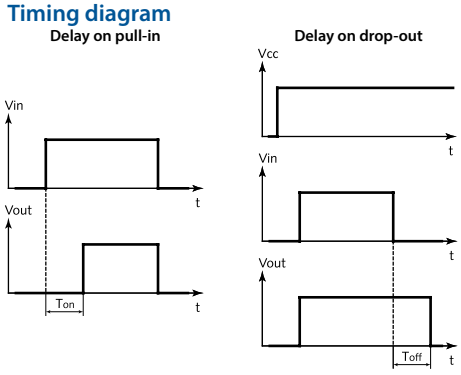
Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

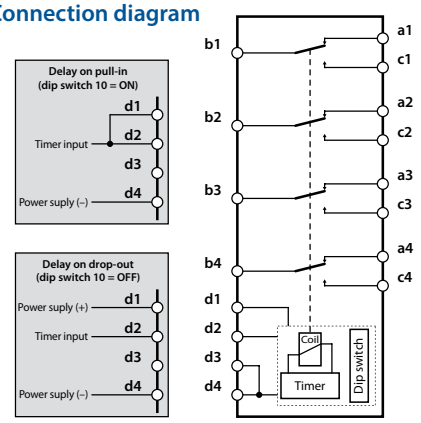
Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GS	24	16 / 33	3	185	30
HS	36	25 / 43	3	475	30
JS	48	33 / 60	3	750	30
KS	72	48 / 90	3	1700	30
MS	96	65 / 120	3	3000	30
LS	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Timing diagram



Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TEAU 400

Delay-on or delay-off, 8 A, 4 C/O

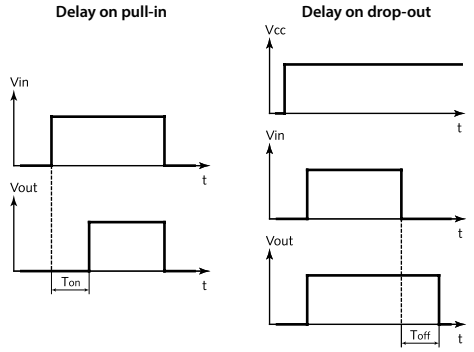
Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

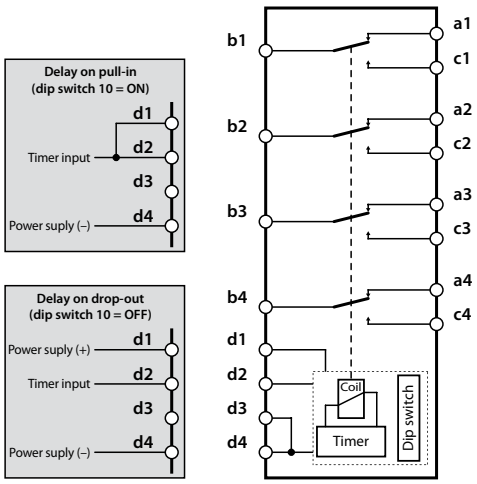
Options

- Weld-no-transfer
- Relay cover for wire locking spring

Timing diagram



Connection diagram



Time delay specifications

Time delay function	**Delay on pull-in or drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116
Detailed information and datasheets available on www.morssmitt.com

TELAU 400

Delay-on or delay-off, 8 A, 4 C/O, extended delay range

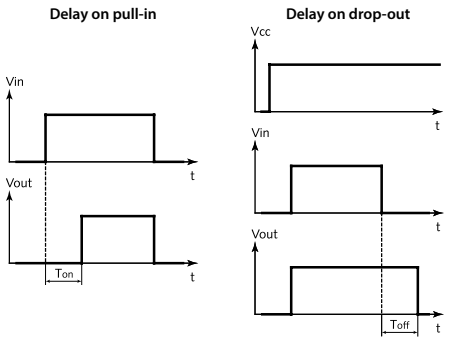
Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts.

- Compact plug-in design
- Delay on plug-in or drop-out relay
- Time delay programmable by dip switch up to 255 hours
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

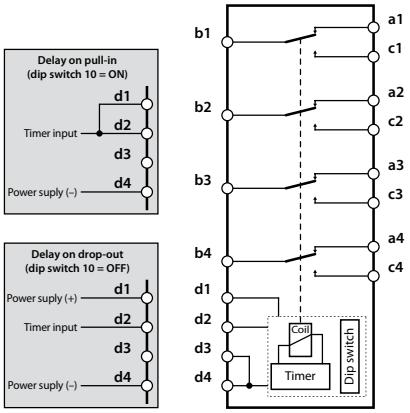
Options

- Weld-no-transfer
- Relay cover for wire locking spring

Timing diagram



Connection diagram



Time delay specifications

Time delay function	**Delay on pull-in or drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 255 h**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GS	24	16 / 33	3	185	30
HS	36	25 / 43	3	475	30
JS	48	33 / 60	3	750	30
KS	72	48 / 90	3	1700	30
MS	96	65 / 120	3	3000	30
LS	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 106
Mounting possibilities & sockets See page 116
Detailed information and datasheets available on www.morssmitt.com

TBBAO 400

Delay-on, 12 A, 4 C/O

Delay on pull-in railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

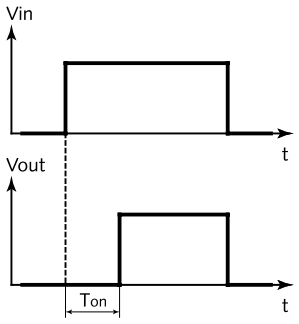
Time delay specifications

Time delay function	**Delay on pull-in**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

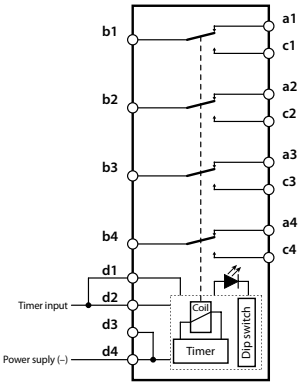
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GR	12	8 / 16	3	40	30
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

TBSBAO 400

Delay-on, 12 A, 4 C/O, short delay times

Delay on pull-in railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on pull-in relay
- Time delay programmable by dip switch (50 ms...1.023 s)
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

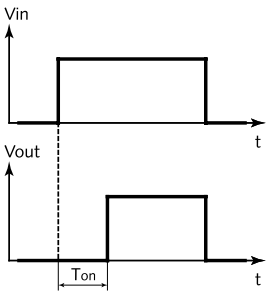
Time delay function	**Delay on pull-in**
Total time delay range	**50 ms...1.023 s**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

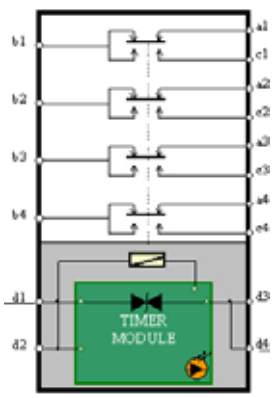
Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Timing diagram

Delay on pull-in



Connection diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GPeA	24	16 / 33	3	185	30
HPeA	36	25 / 43	3	475	30
JPeA	48	33 / 60	3	750	30
KPeA	72	48 / 90	3	1700	30
MPeA	96	65 / 120	3	3000	30
LPeA	110	75 / 138	3	4000	30
LOeA	125	87 / 157	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TBBOR 400

Delay-off, 12 A, 4 C/O

Delay on drop-out railway relay with 4 double make / double break C/O contacts.

- Compact plug-in design
- Delay on drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

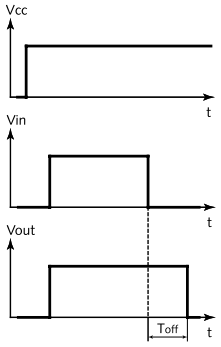
Time delay specifications

Time delay function	**Delay on drop-out**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

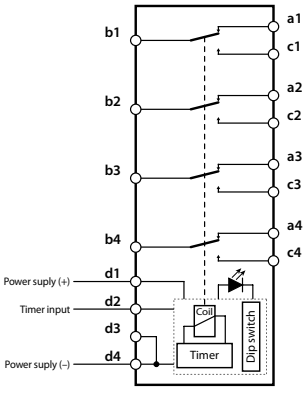
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GR	12	8 / 16	3	40	30
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

TBBU 400

Delay-on or delay-off, 12 A, 4 C/O

Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on plug-in or drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in or drop-out (selection by dip switch)**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

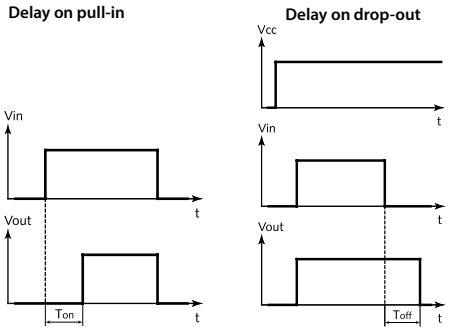
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

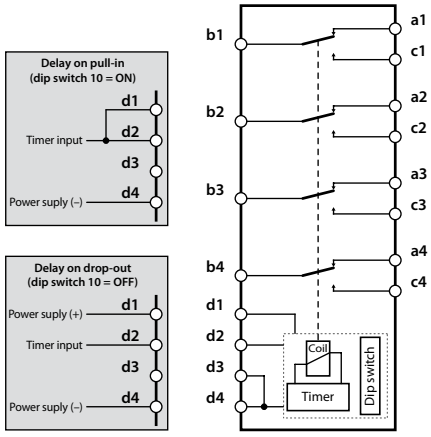
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GR	12	8 / 16	3	40	30
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TBLBU 400

Delay-on or delay-off, 12 A, 4 C/O, extended delay range

Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts.

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch (0.25 h...255 h)
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

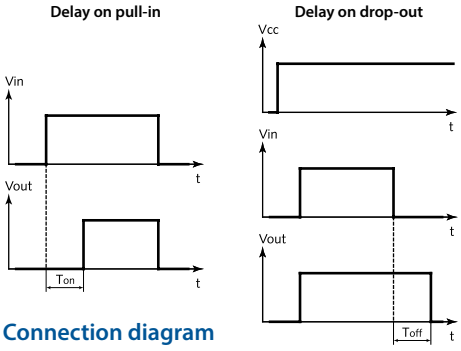
Time delay specifications

Time delay function	**Delay on pull-in or on drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 255 h**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

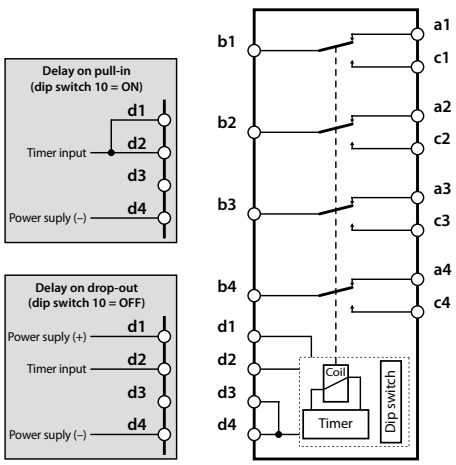
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Timing diagram



Connection diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GS	24	16 / 33	3	185	30
HS	36	25 / 43	3	475	30
JS	48	33 / 60	3	750	30
KS	72	48 / 90	3	1700	30
MS	96	65 / 120	3	3000	30
LS	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

NTBBOR 400

Delay-off, 12 A, 4 C/O

Delay on drop-out with negative command railway relay with 4 double make / double break C/O contacts

- Compact plug-in design
- Delay on drop-out relay with negative command
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

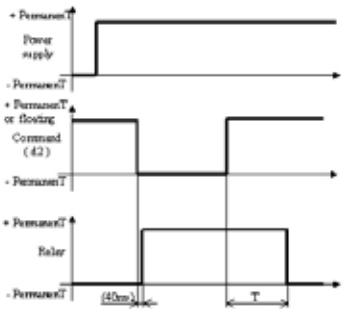
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

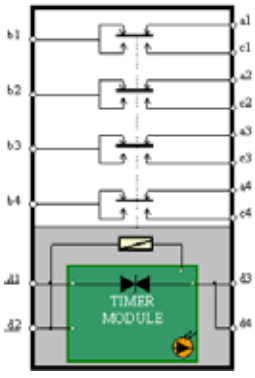
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GP	24	16 / 33	3	185	30
HP	36	25 / 43	3	475	30
JP	48	33 / 60	3	750	30
KP	72	48 / 90	3	1700	30
MP	96	65 / 120	3	3000	30
LP	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

THBBU 400

Delay-on or delay-off, 12 A, 4 C/O, with priority on pull-in

Delay on pull-in or drop-out railway relay with 4 double make / double break C/O contacts. The relay can be activated without delay by 0 V on d3 pin.

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Relay can be direct pull-in by a '0 V' on d3 pin, this command has priority on relay pull-in
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in or on drop-out (selection by dipswitch)**
Total time delay range	**0.25 h... 63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

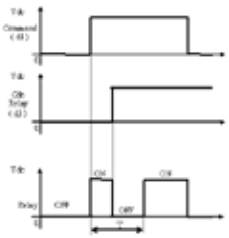
Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
XX	24	16 / 33	3	185	30
XX	36	25 / 43	3	475	30
XX	48	33 / 60	3	750	30
RW	72	48 / 90	3	1700	30
XX	96	65 / 120	3	3000	30
XX	110	75 / 138	3	4000	30

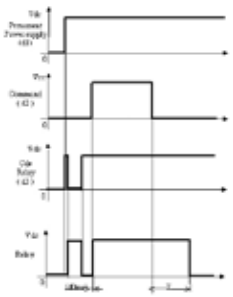
(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Timing diagram

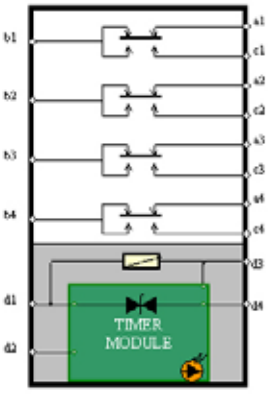
Delay on pull-in



Delay on drop-out



Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TTBCA 200

6 A, 1 delay-on C/O & 1 instantaneous C/O

Time delay relay with 2 change-over simple break contacts with 1 instantaneous and 1 delayed contact. When the relay is activated there is a delay on pull-in for the time delayed contacts.

- Compact plug-in design
- Delay on pull-in and instantaneous functions
- Time delay programmable by dip switch
- 2 simple break C/O contacts with 1 instantaneous and 1 delay C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in and instantaneous**
Total time delay range	**0.5 s... 4 s**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

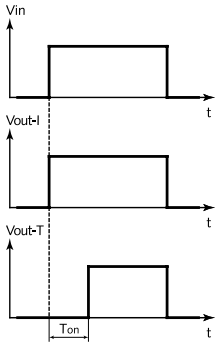
Contact data

Maximum continuous current	**6 A**
Number of contacts	**2 simple break contacts (form Z)**
Contact material	**Ag + 0.2 µm AU**
Contact resistance	**15 mΩ max**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	200 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

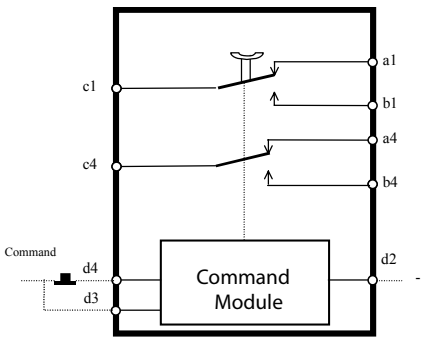


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
AO	24	16 / 33	2	1555	6
tbd (3)	36	25 / 45	2	3300	6
tbd (3)	48	33 / 60	2	6100	6
AG	72	48 / 90	2	12400	6
tbd (3)	96	65 / 120	2	22200	6
tbd (3)	110	75 / 138	2	22200	6

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay (3) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TTBCA 400

6 A, 2 delay-on C/O & 2 instantaneous C/O

Time delay relay with 4 change-over simple break contacts with 2 instantaneous and 2 delayed contacts When the relay is activated there is a delay on pull-in for the time delayed contacts.

- Compact plug-in design
- Delay on pull-in and instantaneous functions
- Time delay programmable by dip switch
- 4 simple break C/O contacts with 2 instantaneous and 2 delay C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in and instantaneous**
Total time delay range	**0.5 s... 60 s**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

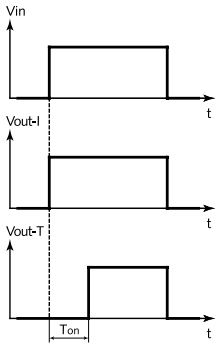
Contact data

Maximum continuous current	**6 A**
Number of contacts	**4 simple break contacts (form Z)**
Contact material	**Ag + 0.2 µm AU**
Contact resistance	**15 mΩ max**
Electrical life expectancy	**See curves on page 108**

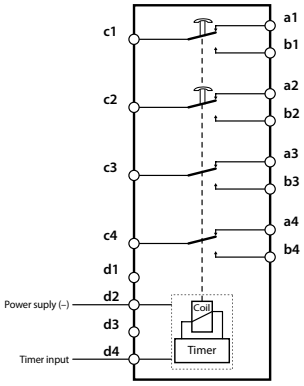
Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	200 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
AO	24	16 / 33	2	1555	6
tbd (3)	36	25 / 45	2	3300	6
tbd (3)	48	33 / 60	2	6100	6
AG	72	48 / 90	2	12400	6
tbd (3)	96	65 / 120	2	22200	6
tbd (3)	110	75 / 138	2	22200	6

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

TTBCR 200

6 A, 1 delay-off C/O & 1 instantaneous C/O

Time delay relay with 2 change-over simple break contacts with 1 instantaneous and 1 delayed contact. When the relay is activated there is a delay on drop-out for the time delayed contacts.

- Compact plug-in design
- Delay on drop-out and instantaneous functions
- Time delay programmable by dip switch
- 2 simple break C/O contacts with 1 instantaneous and 1 delay C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out and instantaneous**
Total time delay range	**0.5 s... 4 s**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

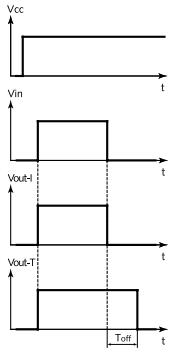
Contact data

Maximum continuous current	**6 A**
Number of contacts	**2 simple break contacts (form Z)**
Contact material	**Ag + 0.2 µm AU**
Contact resistance	**15 mΩ max**
Electrical life expectancy	**See curves on page 108**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	200 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

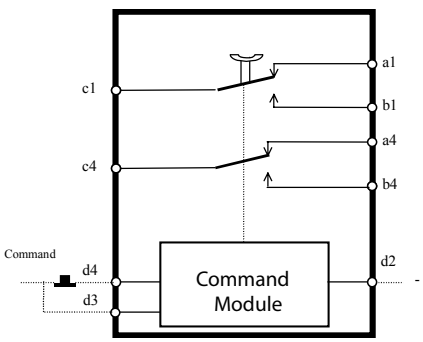


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GP	24	16 / 33	2	1555	6
HP	36	25 / 45	2	3300	6
JP	48	33 / 60	2	6100	6
KP	72	48 / 90	2	12400	6
MP	96	65 / 120	2	22200	6
LP	110	75 / 138	2	22200	6

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TTBCR 400

6 A, 2 delay-off C/O & 2 instantaneous C/O

Time delay relay with 2 change-over simple break contacts with 2 instantaneous and 2 delayed contact. When the relay is activated there is a delay on drop-out for the time delayed contacts.

- Compact plug-in design
- Delay on drop-out and instantaneous functions
- Time delay programmable by dip switch
- 4 simple break C/O contacts with 2 instantaneous and 2 delay C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out and instantaneous**
Total time delay range	**0.5 s... 60 s**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

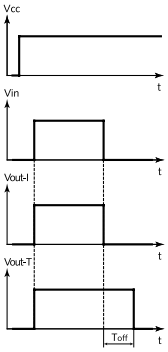
Contact data

Maximum continuous current	**6 A**
Number of contacts	**4 simple break contacts (form Z)**
Contact material	**Ag + 0.2 µm AU**
Contact resistance	**15 mΩ max**
Electrical life expectancy	**See curves on page 108**

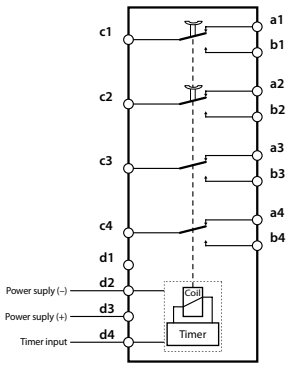
Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	200 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1) (Ω)	L/R (2) (ms)
AN	24	16 / 33	2	1555	6
HP	36	25 / 45	2	3300	6
CN	48	33 / 60	2	6100	6
DN	72	48 / 90	2	12400	6
MP	96	65 / 120	2	22200	6
LW	110	75 / 138	2	22200	6

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TPBAU 400

Delay-on or delay-off, 8 A, 4 C/O

One-shot on pull-in or drop-out railway relay with four double make / double break C/O contacts

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

Time delay specifications

Time delay function	**One-shot, delay on pull-in or on drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

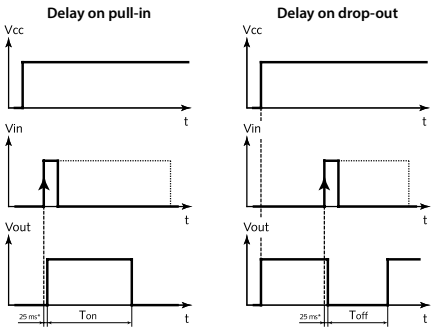
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

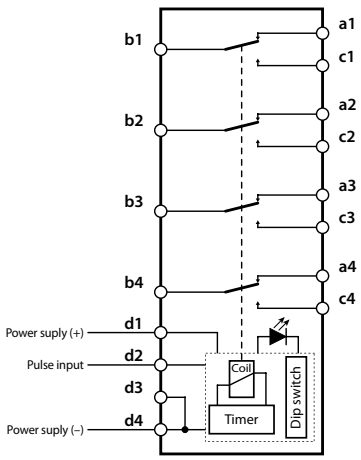
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GT	24	16 / 33	3	185	30
HT	36	25 / 43	3	475	30
JT	48	33 / 60	3	750	30
KT	72	48 / 90	3	1700	30
MT	96	65 / 120	3	3000	30
LT	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
AC versions and other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TPBAUN 400

Delay-on or delay-off with negative edge command, 8 A, 4 C/O

One-shot on pull-in or drop-out railway relay with 4 double make / double break C/O contacts. The delay is triggered by the negative edge of the commmand input.

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Delay triggered by the negative edge of the command input
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

Time delay specifications

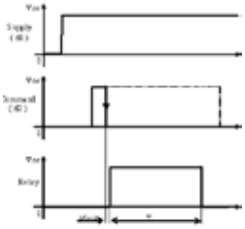
Time delay function	**One-shot, delay on pull-in or on drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

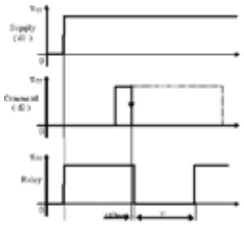
Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

Timing diagram

Delay on pull-in



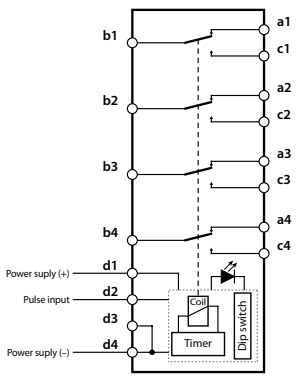
Delay on drop-out



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1) (Ω)	L/R (2) (ms)
tbd (3)	24	16 / 33	3	185	30
tbd (3)	36	25 / 43	3	475	30
tbd (3)	48	33 / 60	3	750	30
KTE	72	48 / 90	3	1700	30
tbd (3)	96	65 / 120	3	3000	30
tbd (3)	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay (3) To be defined
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TPBBU 400

Delay-on or delay-off, 12 A, 4 C/O

One-shot on pull-in or drop-out railway relay with 4 double make / double break C/O contacts.

- Compact plug-in design
- Delay on pull-in or drop-out relay
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

Time delay specifications

Time delay function	**One-shot, delay on pull-in or on drop-out (selection by dip switch)**
Total time delay range	**0.25 h... 63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

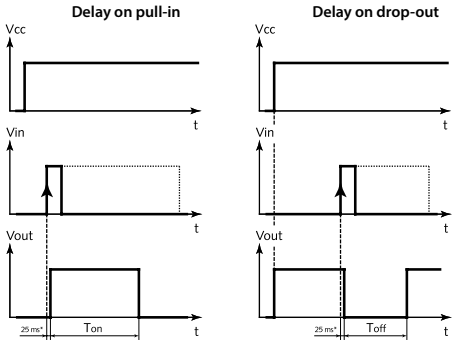
Mechanical life	> 100 x 10^6 operations
Weight	400 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

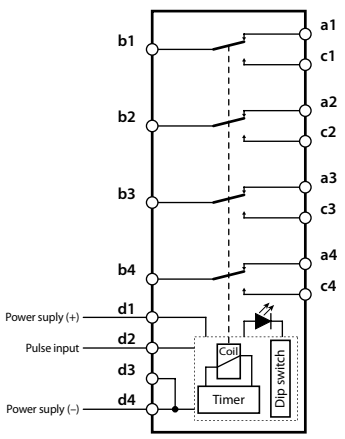
Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1) (Ω)	L/R (2) (ms)
GT	24	16 / 33	3	185	30
HT	36	25 / 43	3	475	30
JT	48	33 / 60	3	750	30
KT	72	48 / 90	3	1700	30
MT	96	65 / 120	3	3000	30
LT	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Timing diagram



Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

T2PBAU 400

Delay-on & delay-off, 8 A, 4 C/O

Two-shot time delay railway relay with 4 double make / double break C/O contacts.

- Compact plug-in design
- Delay on pull-in and on drop-out relay
- Shots triggered by the up and down front of the command input
- Time delay programmable by dip switch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Weld-no-transfer
- Relay cover for wire locking spring

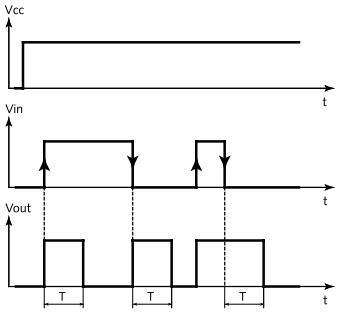
Time delay specifications

Time delay function	**Delay on pull-in and on drop-out (selection by dip switch)**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after setting the dip switch (access available by removing relay cover)**

Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 100 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 108**

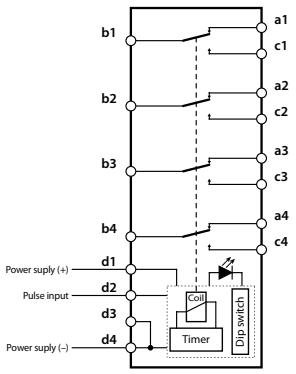
Timing diagram



Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	300 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Connection diagram



Nominal voltage & keying

Keying	U_{nom} (VDC)	$U_{operating}$ (VDC)	P_{nom} (W)	R_{coil} (1) (Ω)	L/R (2) (ms)
GT	24	16 / 33	3	185	30
HT	36	25 / 43	3	475	30
JT	48	33 / 60	3	750	30
KT	72	48 / 90	3	1700	30
MT	96	65 / 120	3	3000	30
LT	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

IB 200

Current monitoring, 1 A, 2 C/O

Current sensor feeding a 2 change-over relay contact for a measured current from 16 A to 24 A.

- Current monitoring relay
- Adjustable current measured with an external shunt
- 2 C/O contacts (form Z)
- Optional lockable knob

Options

On request

Contact data

Maximum continuous current	**1 A**
Number of contacts	**2 change-over contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance	**10 mΩ max**

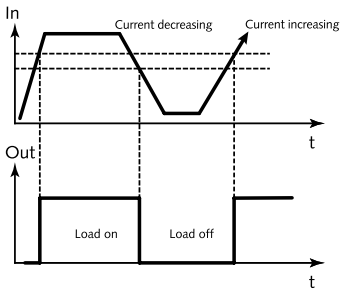
Current measuring specifications

Current levels (I_n)	15 A...25 A (other version available)
Current accuracy	-5%...+5% from I_n
Maximal shunt current	40 A

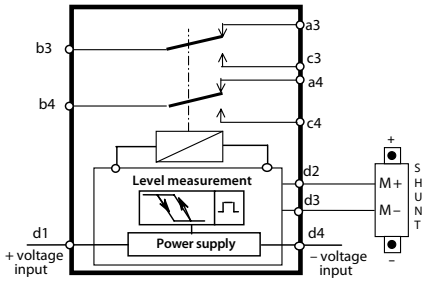
Mechanical & environmental characteristics

Weight	< 400 g
Operating temperature	-40 °C...+85 °C

Timing diagram



Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117

Detailed information and datasheets available on www.morssmitt.com

UB 001

1 level load shedding, delay-on & delay-off, 0.25 A, 1 N/O solid state contact

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of 20 seconds engages before opening a load circuit and of 2 seconds before putting back in service.

- Compact plug-in design
- Load shedding relay, 1 voltage level
- 1 N/O solid state contact
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...2 s (t2) (Fixed value, can be adjusted on request)**

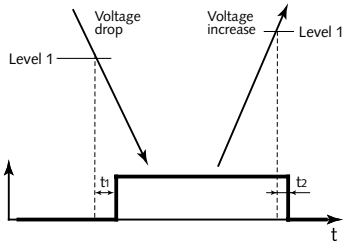
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 10 mA**
Output configuration	**1 N/O solid state contact**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Weight	150 g
Operating temperature	-40 °C...+85 °C

Timing diagram

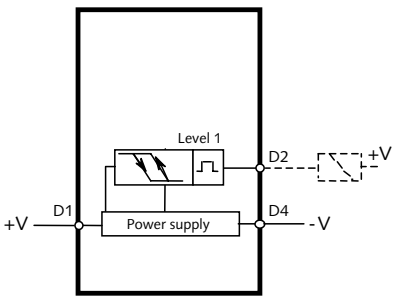


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)
tdb (1)	24	15 / 30	23 / 25
tdb (1)	36	25 / 48	tdb (1)
tdb (1)	48	30 / 64	tdb (1)
tdb (1)	72	46 / 96	65 / 70
tdb (1)	110	70 / 140	87 / 95

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

UB 002

2 level load shedding, delay-on & delay-off, 0.25 A, 2 N/O solid state contacts

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of 20 seconds engages before opening a load circuit and of 2 seconds before putting back in service.

- Compact plug-in design
- Load shedding relay, 2 voltage levels
- 2 N/O solid state contacts
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...2 s (t2) (Fixed value, can be adjusted on request)**

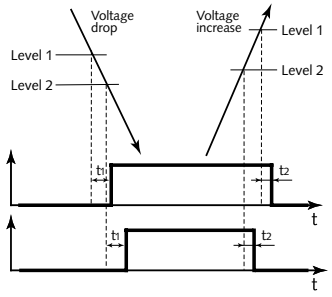
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 10 mA**
Output configuration	**2 N/O solid state contacts**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Weight	150 g
Operating temperature	-40 °C...+85 °C

Timing diagram

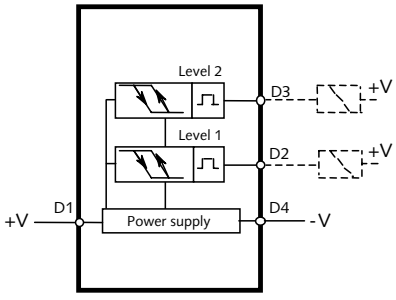


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)	Level 2 drop/increase (VDC)
tdb (1)	24	15 / 30	23 / 25	22 / 25
tdb (1)	36	25 / 48	tdb (1)	tdb (1)
tdb (1)	48	30 / 64	tdb (1)	tdb (1)
tdb (1)	72	46 / 96	65 / 70	63 / 68
tdb (1)	110	70 / 140	87 / 95	85 / 95

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

UB 003

3 level load shedding, delay-on & delay-off, 0.25 A, 3 N/O solid state contacts

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of 20 seconds engages before opening a load circuit and of 2 seconds before putting back in service.

- Compact plug-in design
- Load shedding relay, 3 voltage levels
- 3 N/O solid state contacts
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...2 s (t2) (Fixed value, can be adjusted on request)**

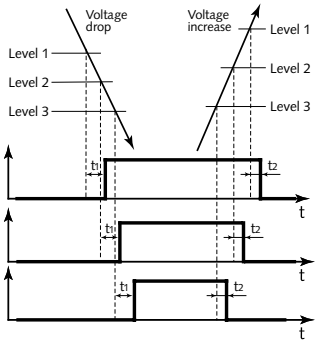
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 10 mA**
Output configuration	**3 N/O solid state contacts**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Weight	150 g
Operating temperature	-40 °C...+85 °C

Timing diagram

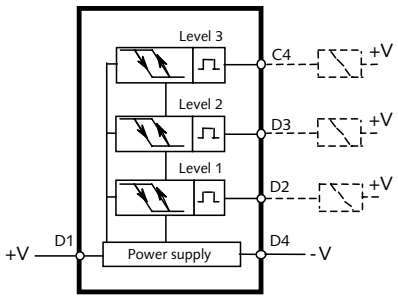


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)	Level 2 drop/increase (VDC)	Level 3 drop/increase (VDC)
tdb (1)	24	15 / 30	23 / 25	22 / 25	20 / 22
tdb (1)	36	25 / 48	tdb (1)	tdb (1)	tdb (1)
tdb (1)	48	30 / 64	tdb (1)	tdb (1)	tdb (1)
DV	72	46 / 96	65 / 70	63 / 68	61 / 66
tdb (1)	110	70 / 140	87 / 95	85 / 95	82 / 92

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

UB 200

Voltage monitoring, delay-on & delay-off, 0.2 A, 2 C/O

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of several[1] seconds engages before opening a load circuit and of several[1] seconds before putting back in service.

- Compact plug-in design
- Voltage montoring relay, 1 voltage level
- 2 C/O contacts (form Z)
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...20 s (t2) (Fixed value, can be adjusted on request)**

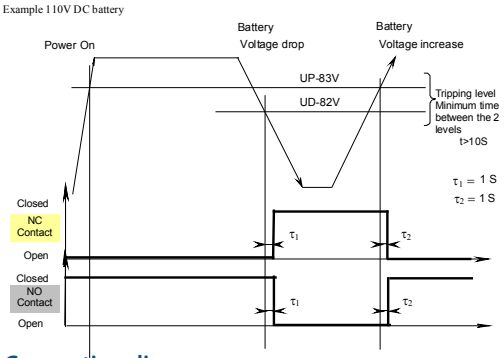
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 20 mA**
Output configuration	**2 C/O form Z**
Maximum load current	**0.2 A**

Mechanical & environmental characteristics

Weight	150 g
Operating temperature	-40 °C...+85 °C

Timing diagram

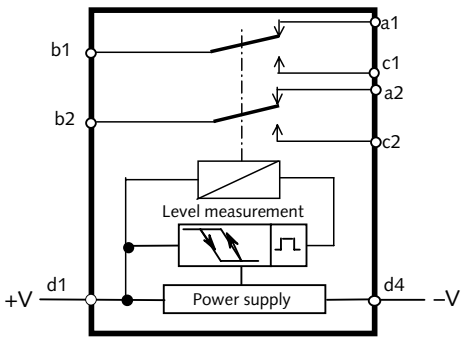


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)
AW	24	16 / 30	18 / 20
BW	36	25 / 48	tdb (1)
tdb (1)	48	33 / 60	tdb (1)
DW	72	48 / 90	55 / 65
EW	110	75 / 138	tdb (1)

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

UB C200

Voltage monitoring, delay-on & delay-off, 3 A, 2 C/O

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of several[1] seconds engages before opening a load circuit and of several[1] seconds before putting back in service.

- Compact plug-in design
- Voltage montoring relay, 1 voltage level
- 2 C/O contacts (form C)
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...20 s (t2) (Fixed value, can be adjusted on request)**

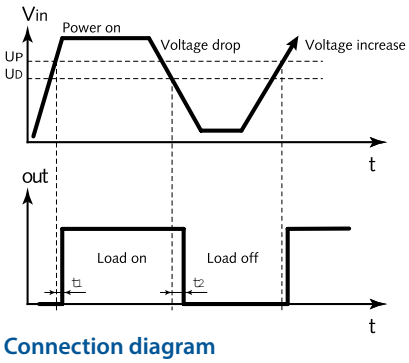
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 50 mA**
Output configuration	**2 C/O form C**
Maximum load current	**3 A**
Contact resistance	**10 mΩ max**
Contact material	**Ag**

Mechanical & environmental characteristics

Weight	450 g
Operating temperature	-40 °C...+85 °C

Timing diagram

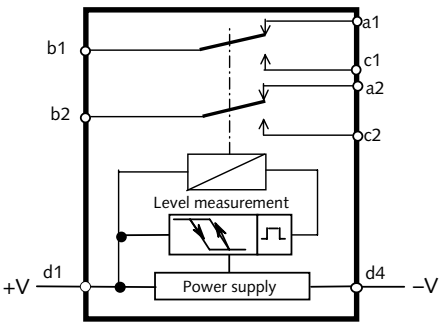


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)
AW	24	16 / 36	tdb (1)
BW	36	25 / 45	tdb (1)
tdb (1)	48	33 / 60	tdb (1)
tdb (1)	72	48 / 90	tdb (1)
EV	110	75 / 138	tdb (1)

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

UB A400

Voltage monitoring, delay-on & delay-off, 5 A, 4 C/O

Voltage monitoring railway relay opens auxiliary loads circuits when battery voltage becomes too low and puts them back in service when battery recovers. Time delay of 20 seconds engages before opening a load circuit and of 2 seconds before putting back in service.

- Compact plug-in design
- Voltage montoring relay, 1 voltage level
- 4 C/O contacts (form C)
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay on voltage increase	**0...20 s (t1) (Fixed value, can be adjusted on request)**
Time delay on voltage drop	**0...20 s (t2) (Fixed value, can be adjusted on request)**

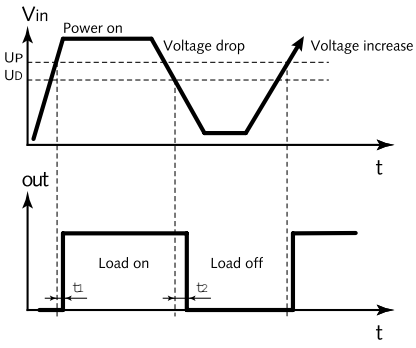
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 50 mA**
Output configuration	**4 C/O form C**
Maximum load current	**5 A**
Contact resistance	**10 mΩ max**
Contact material	**Hard silver overlay laminated to copper**

Mechanical & environmental characteristics

Weight	450 g
Operating temperature	-40 °C...+85 °C

Timing diagram

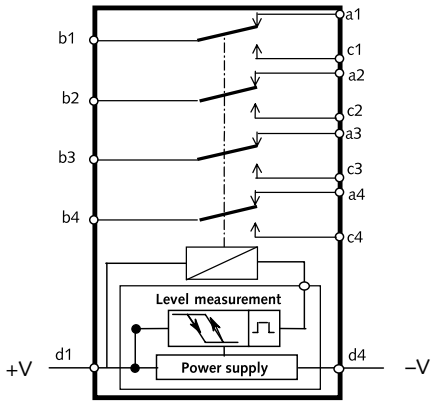


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)
tdb (1)	24	15 / 30	tdb (1)
tdb (1)	36	25 / 48	tdb (1)
tdb (1)	48	30 / 64	tdb (1)
tdb (1)	72	46 / 96	tdb (1)
EZ	110	77 / 137.5	90 / 100

(1) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

TCBBU 400

Flashing symmetrical, 10 A, 4 C/O

Symmetrical flashing railway relay with 4 double make / double break C/O contacts (form Z). When relay is activated the coil is energised with a pulse. The pulse time is adjustable.

- Compact plug-in design
- Flashing relay (symmetrical)
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Flashing (symmetrical)**
Pulse time	**0.25 s...63.75 min**

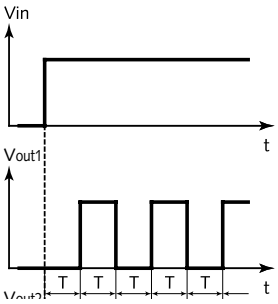
Contact data

Maximum continuous current	**10 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

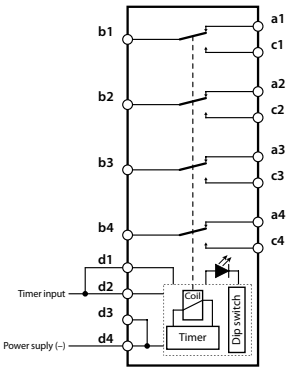


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GN	24	16 / 33	3.5	185	30
HN	36	25 / 45	3.5	475	30
JN	48	33 / 60	3.5	750	30
KN	72	48 / 90	3.5	1700	30
MN	96	65 / 120	3.5	3000	30
LN	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

T2CBBU 400

Flashing asymmetrical, 12 A, 4 C/O

Asymmetrical flashing railway relay with 4 double make / double break C/O contacts (form Z). When relay is activated the coil is energised with a pulse. The pulse and interval times are adjustable.

- Compact plug-in design
- Flashing relay (asymmetrical)
- Time delay programmable by dipswitch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Flashing (asymmetrical)**
Pulse time	**0.1 s...1.5 s**
Interval time	**1 s...15 s**

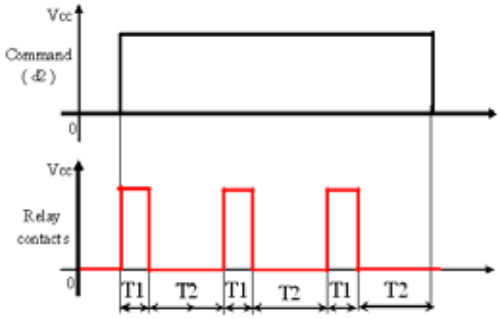
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

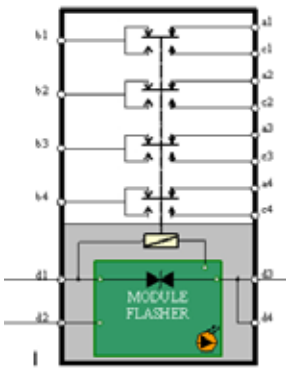


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
GO	12	8 / 16	3	40	30
tbd (3)	24	16 / 33	3	185	30
tbd (3)	36	25 / 45	3	475	30
tbd (3)	48	33 / 60	3	750	30
KO	72	48 / 90	3	1700	30
tbd (3)	96	65 / 120	3	3000	30
tbd (3)	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay (3) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

T2CBLBU 400

Flashing asymmetrical, extended delay range, 12 A, 4 C/O

Asymmetrical flashing railway relay with 4 double make / double break C/O contacts (form Z). When relay is activated the coil is energised with a pulse. The pulse and interval times are adjustable.

- Compact plug-in design
- Flashing relay (asymmetrical)
- Time delay programmable by dipswitch
- 4 double make / double break C/O contacts (form Z)
- Status LED indicator
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Flashing (asymmetrical)**
Pulse time	**0.1 s...7.5 s**
Interval time	**1 s...150 s**

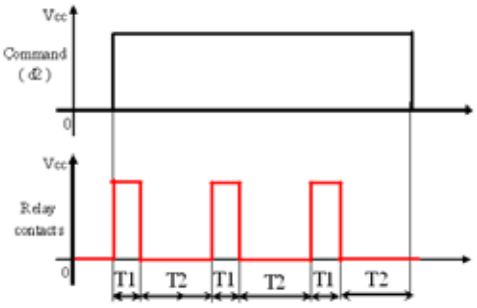
Contact data

Maximum continuous current	**12 A**
Contact overload withstand	**At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**4 double make / double break contacts (form Z)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 112**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

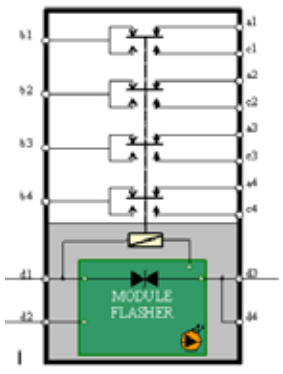


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	Rcoil (1)(Ω)	L/R (2) (ms)
tbd (3)	24	16 / 33	3	185	30
tbd (3)	36	25 / 45	3	475	30
tbd (3)	48	33 / 60	3	750	30
tbd (3)	72	48 / 90	3	1700	30
tbd (3)	96	65 / 120	3	3000	30
tbd (3)	110	75 / 138	3	4000	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay (3) To be defined
Other types on request

Connection diagram



Dimensions See page 107
Mounting possibilities & sockets See page 117
Detailed information and datasheets available on www.morssmitt.com

Example ordering scheme A- / B-platform

SERVING SAFETY

Each relay has its own ordering scheme. In this scheme all available possibilities for this relay is mentioned and can be selected. On www.morssmitt.com all datasheets for all relays are available.

Example: AG 400 relay

Configuration:

AG 400	24	AG	S	C	V	F	1
1. Relay model	2. Nominal voltage	3. Keying	4. Coil OVP	5. Weld no transfer	6. LED ind.	7. Cover type	8. Language (test report)

This example represents a **AG 400 24 AG S C V F 1**.
Description: AG 400 series relay, Unom: 24 VDC, keying AG, transil coil protection, weld-no-transfer, LED indicator, relay cover for wire locking spring, test report in English

1. Relay model

AG 400

2 & 3. Nominal voltage and keying

AG	24 VDC	US	96 VDC
FKL	36 VDC	SV	110 VDC
DG	48 VDC	EG	125 VDC
BG	72 VDC		

4. Coil overvoltage protection

–	No coil protection
P	Avalance diode coil protection
S	Transil coil protection (only with 400 type)

5. Weld-no-transfer option

–	Regular double break contacts
C	Weld-no-transfer

6. LED indicator

–	No LED
V	LED voltage indicator

7. Relay cover type

–	Relay cover with lock pins
F	Relay cover forwire locking spring

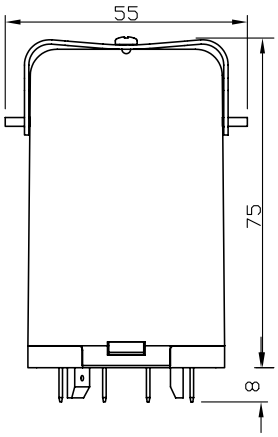
8. Language on test report

–	French
1	English
2	Spanish

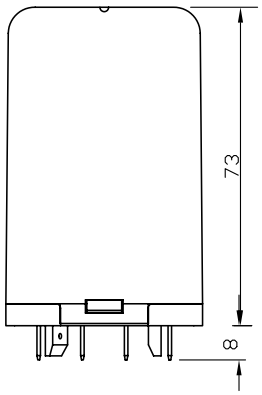
Dimensions

Dimensions (mm)
for relay type:

- **A 400**
- **AG 400**
- **AK 400**
- **AM 400**



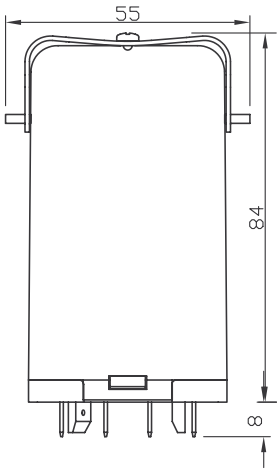
locking brackets



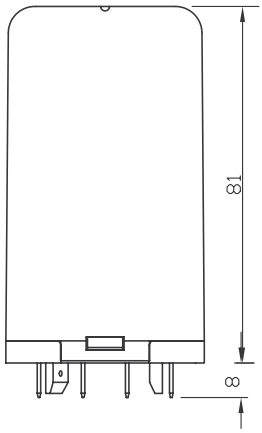
wire locking spring

Dimensions (mm)
for relay type:

- **TEAU 400**
- **TELAU 400**



locking brackets

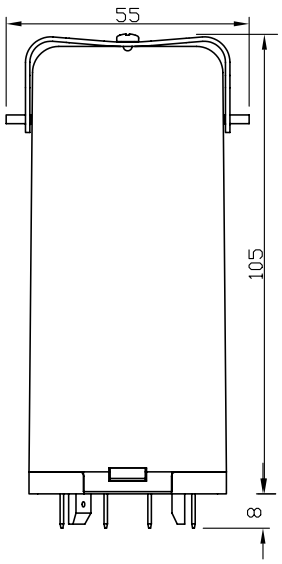


wire locking spring

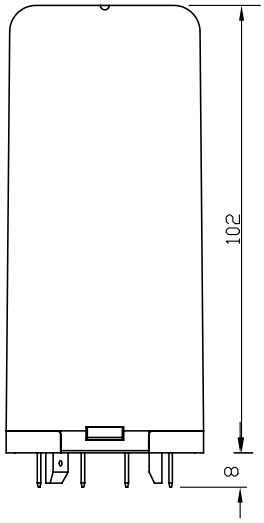
Dimensions

Dimensions (mm) for relay type:

- B 400
- BG 400
- BK 400
- BM 400
- NTBBOR 400
- SB
- T2CBBU 400
- T2CBLBU 400
- T2PBAU 400
- TBAA 400
- TBAR 400
- TBAU 400
- TBBAO 400
- TBBOR 400
- TBBU 400
- TBLAU 400
- TBLBU 400
- TBSBAO 400
- TCBBU 400
- TFBBU 400
- THBBU 400
- TPBAU 400
- TPBAUN 400
- TPBBU 400
- TTBCA 200
- TTBCA 400
- TTBCR 200
- TTBCR 400
- UB 001
- UB 002
- UB 003
- UB 200
- UB A400
- UB C200



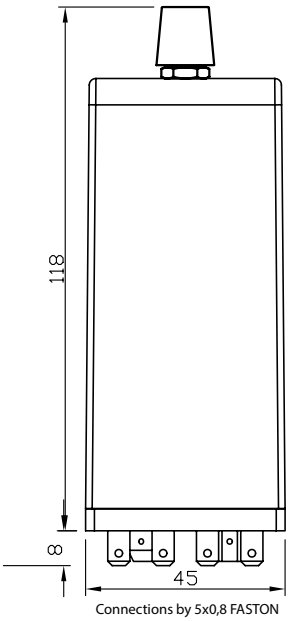
locking brackets

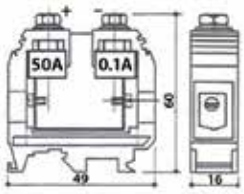


wire locking spring

Dimensions (mm) for relay type:

- IB 200





Shunt

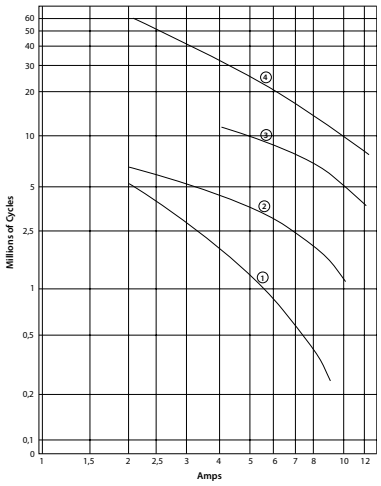
Electrical life expectancy

A- / B-platform curves 1

Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24

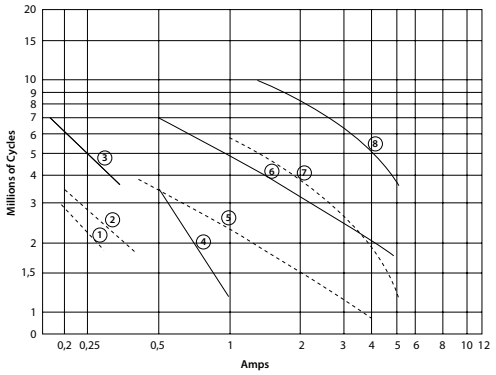


Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load:
——— L/R= 20 ms continuous current
– – – – L/R= 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-6	7-8
VDC	220	125	48	24

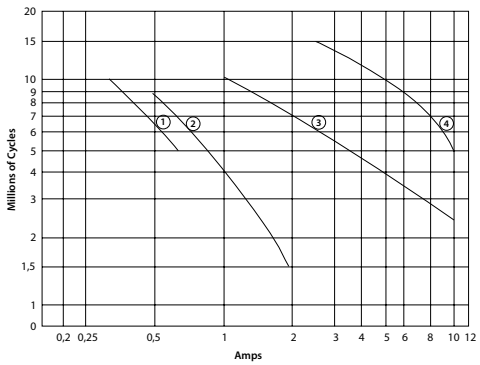


Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24

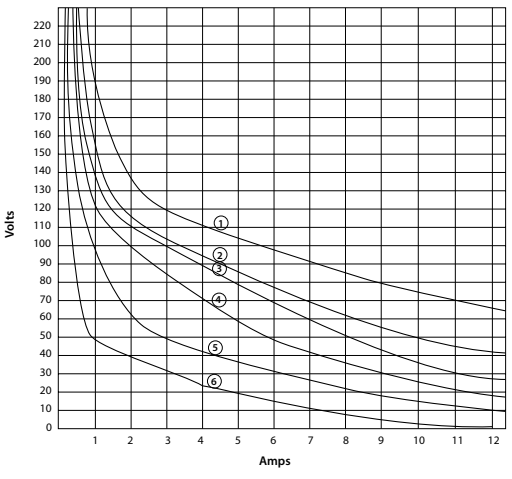


Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R.
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Life expectancy: 2 Millions of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms



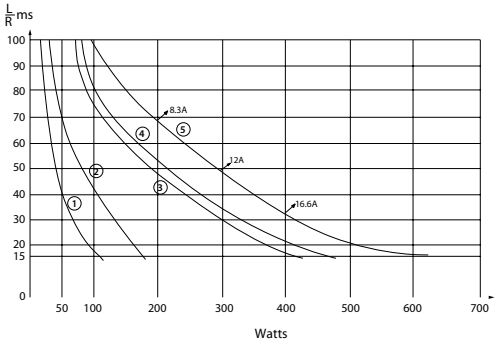
Electrical life expectancy

A- / B-platform curves 1

Dynamic relay selection curve No 5

Maximum power interruption versus load time constant (L/R) for a given voltage.
Curves shown for resistive loads. I = P/V.

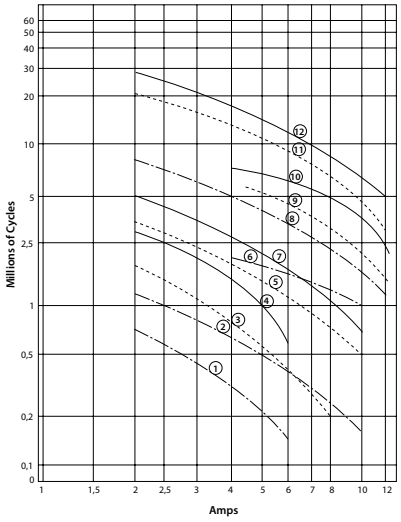
Curve	1	2	3	4	5
VDC	220	125	72	48	24



Dynamic relay selection curve No 6

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads -
——— Cos Ø = 0.7
– – – – Cos Ø = 0.5
—·— Cos Ø = 0.3

Curves	1,3 &4	2,5 &7	6,9 &10	8,11 &12
VAC	220	125	48	24



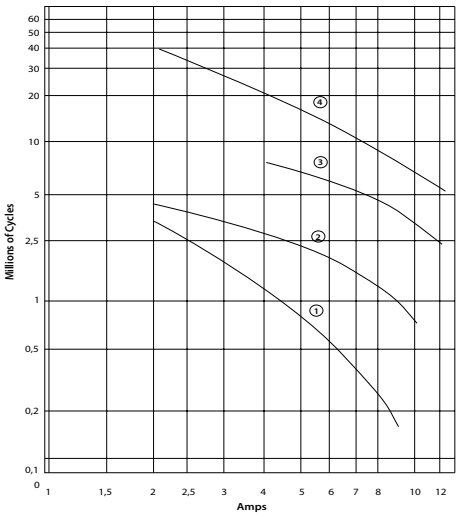
Electrical life expectancy

A- / B-platform curves 2

Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24

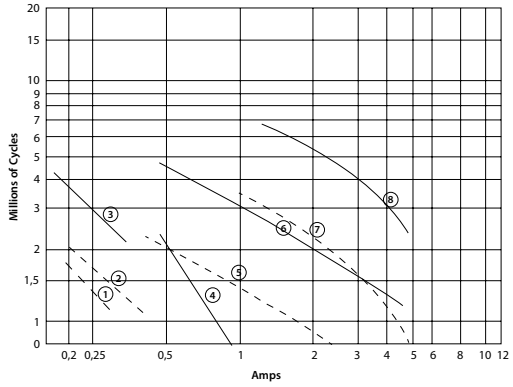


Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load:
——— L/R= 20 ms continuous current
– – – – L/R= 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-6	7-8
VDC	220	125	48	24

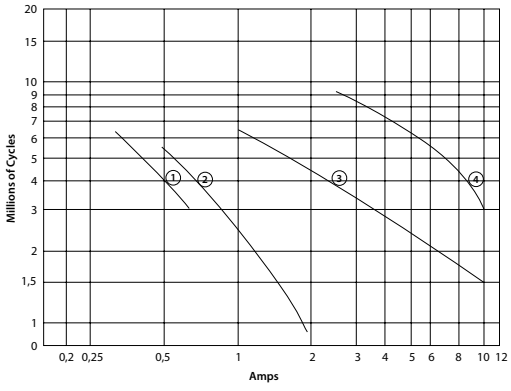


Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24

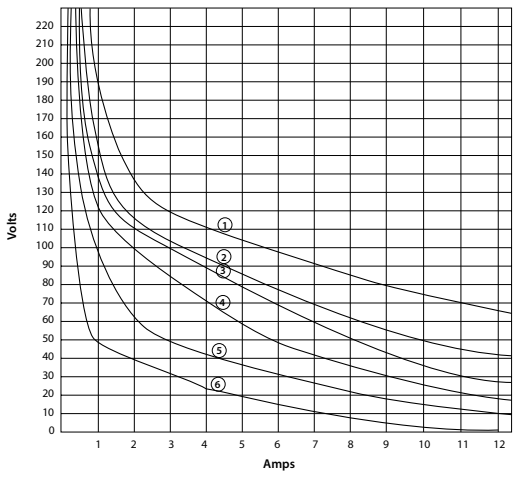


Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R.
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Life expectancy: 800,000 of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms

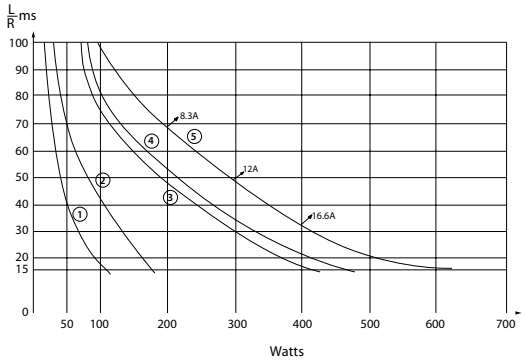


A- / B-platform curves 2

Dynamic relay selection curve No 5

Maximum power interruption versus load time constant (L/R) for a given voltage.
Curves shown for resistive loads. I = P/V.

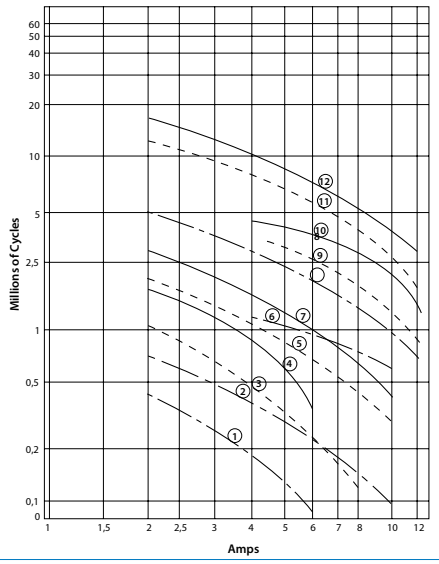
Curve	1	2	3	4	5
VDC	220	125	72	48	24



Dynamic relay selection curve No 6

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads -
——— Cos Ø = 0.7
– – – – Cos Ø = 0.5
—·— Cos Ø = 0.3

Curves	1,3 &4	2,5 &7	6,9 &10	8,11 &12
VAC	220	125	48	24



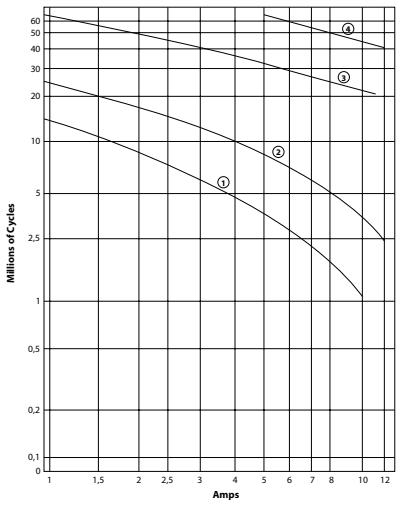
Electrical life expectancy

A- / B-platform curves 3

Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24

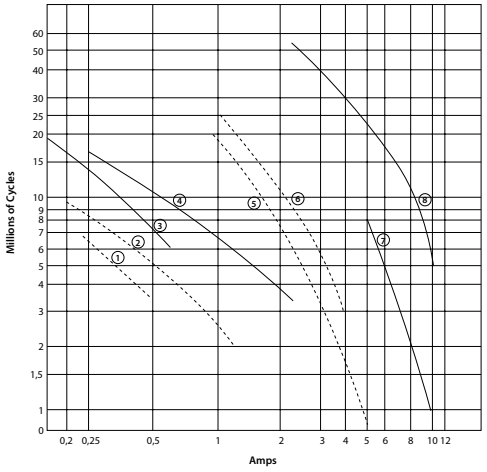


Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load -
——— L/R= 20 ms continuous current
– – – – L/R= 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24

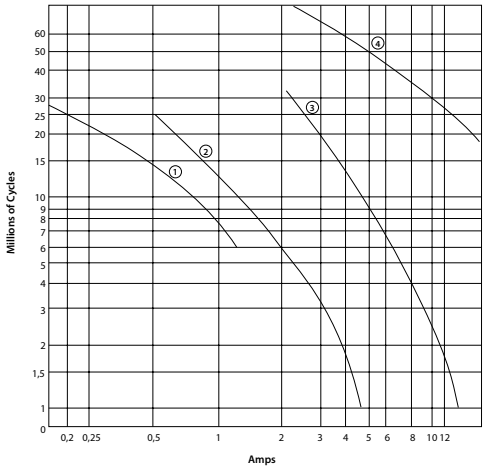


Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24

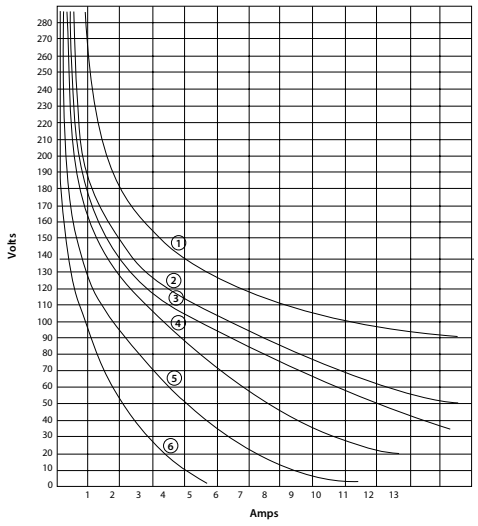


Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R.
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Life expectancy: 2 Millions of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms

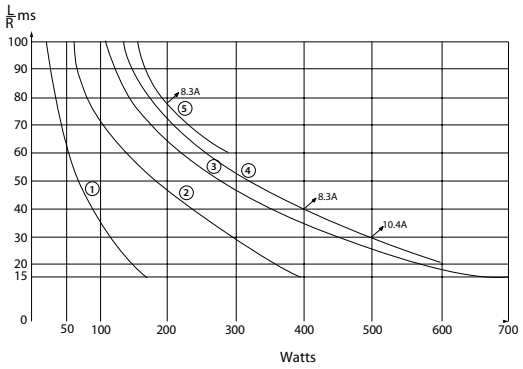


A- / B-platform curves 3

Dynamic relay selection curve No 5

Maximum power interruption versus load time constant (L/R) for a given voltage.
Curves shown for resistive loads. I = P/V.

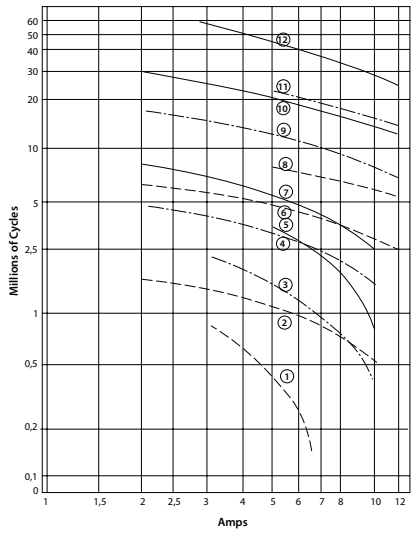
Curve	1	2	3	4	5
VDC	220	125	72	48	24



Dynamic relay selection curve No 6

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads -
——— Cos Ø = 0.7
—·— Cos Ø = 0.5
– – – – Cos Ø = 0.3

Curves	1,3 &5	2,4 &7	6,9 &10	8,11 &12
VAC	220	125	48	24



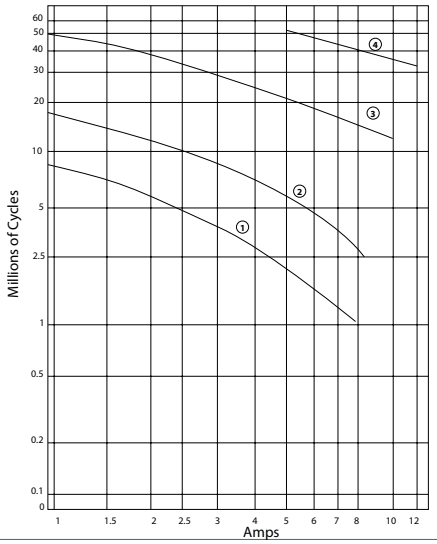
Electrical life expectancy

A- / B-platform curves 4

Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive (Power factor = 1)

Curves	1	2	3	4
VAC	220	125	48	24

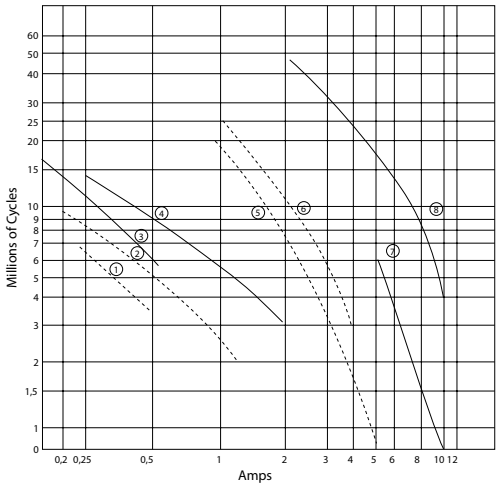


Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load -
L/R = 20 ms continuous current
L/R = 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50%

Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24

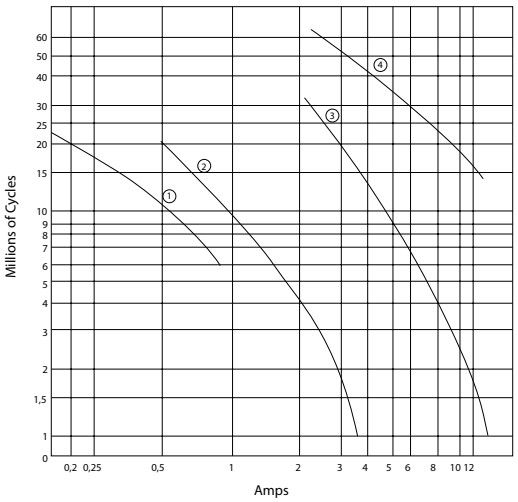


Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50%

Curves	1	2	3	4
VDC	220	125	48	24

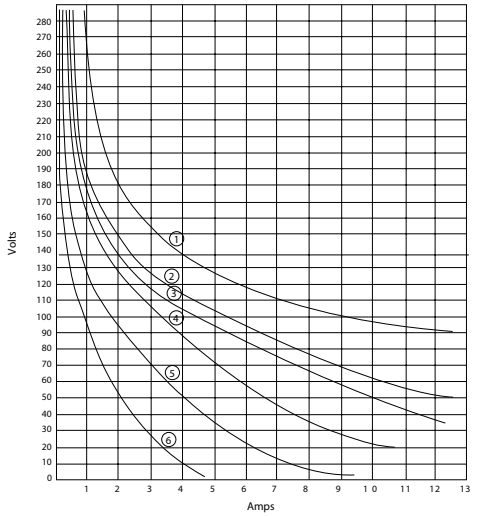


Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R = 0) and inductive loads. Continuous current.

Life expectancy: 800,00 cycles

Curves	1	2	3	4	5	6
L/R=	0 ms	15 ms	20 ms	40 ms	60 ms	100 ms



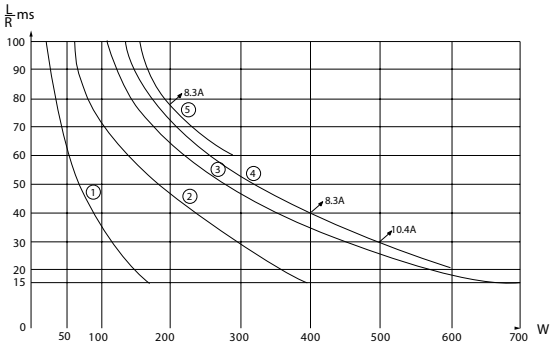
Electrical life expectancy

A- / B-platform curves 4

Dynamic relay selection curve No 5

Maximum power interuption versus load time constant (L/R) for a given voltage
Curves shown for resistive load I = P/V

Curves	1	2	3	4	5
VDC	220	125	72	48	24

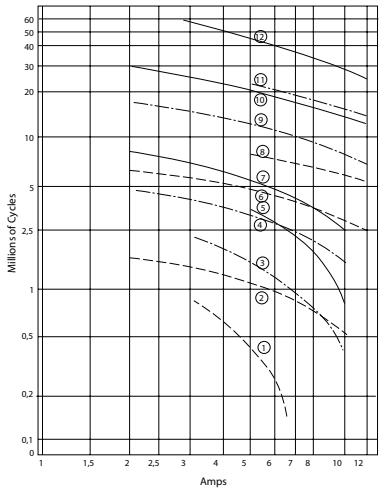


Dynamic relay selection curve No 6

AC current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads:

——— Cos Ø = 0.7
—·—·— Cos Ø = 0.5
– – – – Cos Ø = 0.3

Curves	1, 3 & 5	2 , 4 & 6	6, 9 & 10	8, 11 & 12
VAC	220	125	48	24



A- / B-platform sockets

Mounting possibilities

The relay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

EA 102 A

EA 103AF

Surface / wall mounting

EA 103 AF Wire locking spring, front connection, M3 screw 6.5 mm ring terminals (2.5 mm²)
EA 105 AF Wire locking spring, front connection, single faston 5 mm

Mounting on 35 mm rail possible by adding suffix D (see socket datasheet)

Panel / flush mounting

EA 102 A Locking bracket, rear connection, double Faston 5 mm
EA 102 AF Wire locking spring, rear connection, single Faston 5 mm
EA 104 A Locking bracket, rear connection, single Faston 5 x 0.8 mm
EA 104 AF Wire locking spring, rear connection, single Faston 5 x 0.8 mm
EA 112 AF Wire locking spring, rear connection, crimp contact

Suitable for

- A 400
- AG 400
- AK 400
- AM 400

EA 104 A

EA 112 AF

EA 102 E

EA 103 EF

Surface / wall mounting

EA 103 EF Wire locking spring, front connection, M3 screw 6.5 mm ring terminals (2.5 mm²)
EA 105 EF Wire locking spring, front connection, single faston 5 mm

Mounting on 35 mm rail possible by adding suffix D (see socket datasheet)

Panel / flush mounting

EA 102 E Locking bracket, rear connection, double Faston 5 mm
EA 102 EF Wire locking spring, rear connection, single Faston 5 mm
EA 104 E Locking bracket, rear connection, single Faston 5 x 0.8 mm
EA 104 EF Wire locking spring, rear connection, single Faston 5 x 0.8 mm
EA 112 EF Wire locking spring, rear connection, crimp contact

Suitable for

- TEAU 400
- TELAU 400

EA 104 E

EA 112 EF

EA 103 BFD

Surface / wall mounting

EA 103 BFD Wire locking spring, 35 mm rail

Suitable for

- IB 200

Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

A- / B-platform sockets

Mounting possibilities

The relay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

Surface / wall mounting

EA 103 BF	Wire locking spring, front connection, M3 screw 6.5 mm ring terminals (2.5 mm²)
EA 105 BF	Wire locking spring, front connection, single faston 5 mm
EA 111	Wire locking spring, front connection, spring clamp socket, front dual connection (2.5 mm²)

Mounting on 35 mm rail possible by adding suffix D (see socket datasheet)

Panel / flush mounting

EA 102 B	Locking bracket, rear connection, double Faston 5 mm
EA 102 BF	Wire locking spring, rear connection, single Faston 5 mm
EA 104 B	Locking bracket, rear connection, single Faston 5 x 0.8 mm
EA 104 BF	Wire locking spring, rear connection, single Faston 5 x 0.8 mm
EA 112 BF	Wire locking spring, rear connection, crimp contact

EA 102 B

EA 103 BF

EA 104 B

EA 111

EA 112 BF

Suitable for

- B 400
- BG 400
- BK 400
- BM 400
- NTBBOR 400
- T2CBBU 400
- T2CBLBU 400
- T2PBAU 400
- TBAA 400
- TBAR 400
- TBAU 400
- TBBAO 400
- TBBOR 400
- TBBU 400
- TBLAU 400
- TBLBU 400
- TBSBAO 400
- TCBBU 400
- TFBBU 400
- THBBU 400
- TPBAU 400
- TPBAUN 400
- TPBBU 400
- TTBCA 200
- TTBCA 400
- TTBCR 200
- TTBCR 400
- UB 001
- UB 002
- UB 003
- UB 200
- UB A400
- UB C200

Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

CU-platform

Flat multifunctional relays up to 9 change-over contacts and very long mechanical contact life of 100 million cycles. These relays all have the same base of 33 x 65 mm.

Different models are available for different applications.

Design features

Dimension
Miniature design

Suitable for hazardous areas
Corrosion resistant. Shock & vibration resistant

Cover
Transparent cover for visual check. On the top clear indication of type, contact arrangement and coil voltage.

Weld-no-transfer contacts
Safety design counter blade system. Relay always stays in a logic configuration. For safety-critical applications.

Contacts
Up to 2 change-over contacts. Standard Ag contact material. Goldplated contact material on request. Calibrated contact pressure.

Keying
Optional positive mechanical keying relay to socket

Plug-in or PCB design
Wide range of sockets for front or rear mounting and connection types

Options

The CU-relays (and derived models) can be equipped with many options. The concept allows composing the CU-relays to almost any solution, however not all options or combinations are possible. Check possible options and combinations with our sales department.

E	**Goldplated contacts**	Silver contacts with thin layer of gold to have a good resistance against corrosive atmospheres. Suitable for switching low currents and low voltages.
D	**Low operating voltage**	The relay has a large pull-in voltage range of 40% - 125% of the nominal voltage.
Lg	**LED green**	Built-in green LED to indicate the presence of power supply and the energising of the coil.
Lr	**LED red**	Built-in red LED to indicate the presence of power supply and the energising of the coil.
Key-ing	**Mechanical keying relays to socket**	Positive mechanical keying relays to socket to prevent a relay being inserted in a wrong socket.

CU/CP-U200-G

Miniature, 6 A, 2 C/O

Miniature railway relay with 2 change-over contacts.

- Miniature plug-in / PCB-relay
- Instantaneous, 2 C/O contacts
- High insulation because of flash barrier
- Weld-no-transfer contacts
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- LED (green or red)

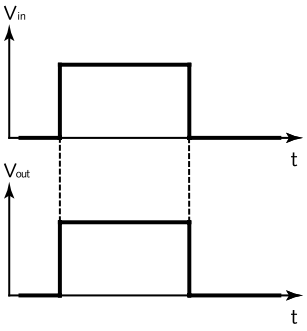
Contact data

Amount and type of contacts	2 C/O
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page133**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

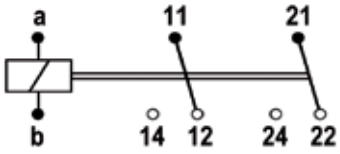


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil *(Ω)
CU/CP-U201-G	24	16.8	30	9.2	1550
CU/CP-U202-G	48	33.6	60	18.4	6306
CU/CP-U203-G	72	50.4	90	27.7	12887
CU/CP-U204-G	110	77	137.5	42.2	22630
CU/CP-U205-G	96	67.2	120	36.9	22630
CU/CP-U206-G	12	8.4	15	4.6	300
CU/CP-U207-G	36	25.2	45	13.8	2500

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U300-G

Miniature, AC coil, 6 A

Miniature railway relay with 2 change-over contacts suitable for AC coil voltages with a frequency of 50/60 Hz.

- Miniature plug-in / PCB-relay
- Instantaneous, 2 C/O contacts
- AC coil
- Weld-no-transfer contacts
- High insulation because of flash barrier
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- LED (green or red)

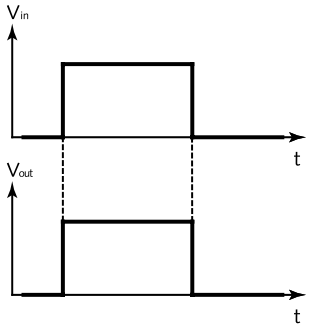
Contact data

Amount and type of contacts	2 C/O
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 133**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

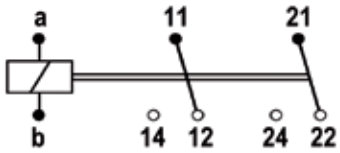


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil *(Ω)
CU/CP-U301-G	24	16.8	30	9.2	221
CU/CP-U310-G	220	154	275	77	15371
CU/CP-U311-G	115	80.5	144	40.3	2500

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U200-B

Miniature, high contact life, 8 A, 2 C/O

Miniature railway relay with 2 change-over contacts. Equipped with magnetic arc blow-out for higher contact life.

- Miniature plug-in / PCB-relay
- Instantaneous 2 C/O contacts
- Weld-no-transfer contacts
- Magnetic arc blow-out
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- Double make / double break contact (1 C/O)
- LED (green or red)

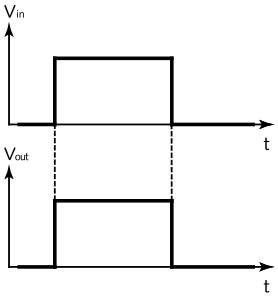
Contact data

Number and type of contacts	2 C/O
Maximum make current	**10 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag
Electrical life expectancy and maximum switching capacity	**See curves on page 134**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

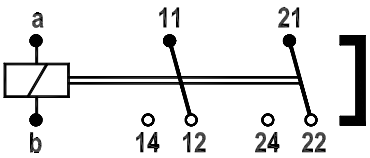


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil *(Ω)
CU/CP-U201-B	24	16.8	30	2.4	600
CU/CP-U202-B	48	33.6	60	4.8	2500
CU/CP-U203-B	72	50.4	90	7.2	4739
CU/CP-U204-B	110	77	137.5	11	12887
CU/CP-U205-B	96	67.2	120	9.6	9647
CU/CP-U206-B	12	8.4	15	1.2	165
CU/CP-U207-B	36	25.2	45	3.6	1550
CU/CP-U210-B	120	84	150	12	15371

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

CU/CP-U200-D

Miniature, large pull-in voltage range, 6 A, 1 C/O + 1 N/O

Miniature railway relay with 1 change-over contact and 1 normally open contact. Very sensitive with a large pull-in voltage range: 40 %...125 % of the nominal voltage.

- Miniature plug-in / PCB-relay
- Instantaneous, 1 C/O + 1 N/O contact
- Sensitive coil (40 % Unom)
- High insulation because of flash barrier
- Weld-no-transfer contacts
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- LED (green or red)

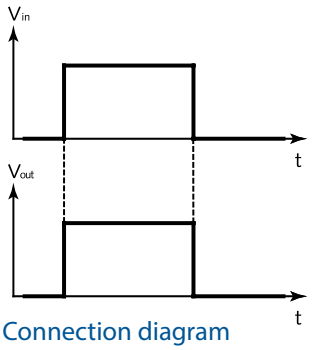
Contact data

Amount and type of contacts	1 C/O + 1 N/O
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 133**

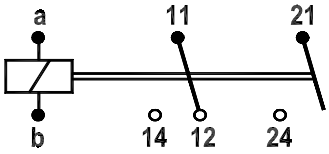
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Connection diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil * (Ω)
CU/CP-U201-D	24	9.6	30	9.2	1550
CU/CP-U202-D	48	19.2	60	18.4	6306
CU/CP-U203-D	72	28.8	90	27.7	12887
CU/CP-U204-D	110	44	137.5	42.2	22630
CU/CP-U205-D	96	38.4	120	36.9	22630
CU/CP-U206-D	12	4.8	15	4.6	390
CU/CP-U207-D	36	14.4	45	13.8	3300
CU/CP-U210-D	120	48	150	6.0	22630

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U200-U

Miniature, high contact life, 8 A, 1 double make / double break

Miniature railway relay with 1 double make / double break contact. High maximum contact current and long electrical life.

- Miniature plug-in / PCB-relay
- 1 double make / double break contact
- High maximum current
- Long electrical life
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- LED (green or red)

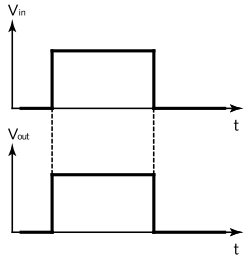
Contact data

Amount and type of contacts	1 double make / double break
Maximum make current	**15 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 135**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

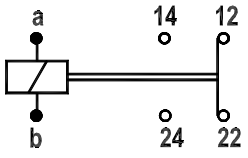


Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil *(Ω)
CU/CP-U201-U	24	16.8	30	9.2	1550
CU/CP-U202-U	48	33.6	60	18.4	6306
CU/CP-U203-U	72	50.4	90	27.7	12887
CU/CP-U204-U	110	77	137.5	42.2	22630
CU/CP-U205-U	96	67.2	120	36.9	22630
CU/CP-U206-U	12	8.4	15	4.6	300
CU/CP-U207-U	36	25.2	45	13.8	2500

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U300-U

Miniature, high contact life, AC coil, 8 A, 1 double make / double break

Miniature railway relay with 1 double make / double break contact, suitable for AC coil voltages with a frequency of 50/60 Hz. High maximum contact current and long electrical life.

- Miniature plug-in / PCB-relay
- 1 double make / double break contact
- AC coil
- High maximum current
- Long electrical life
- Transparant cover
- Optional positive mechanical keying relay to socket
- Optional LED (red or green)

Options

- Gold plated contacts
- LED (green or red)

Contact data

Amount and type of contacts	1 double make / double break
Maximum make current	**15 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 135**

Mechanical & environmental characteristics

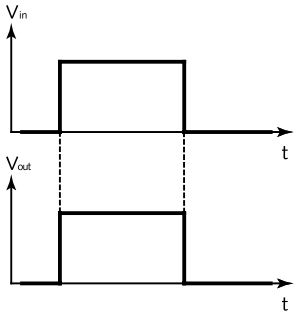
Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Nominal voltage

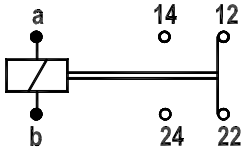
Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil *(Ω)
CU/CP-U301-U	24	16.8	30	8.4	221
CU/CP-U310-U	220	154	275	77	15371
CU/CP-U311-U	115	80.5	144	40.3	2500

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
Other types on request

Timing diagram



Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

KCS/KCP-U200

Faston, 6 A, 2 C/O

Bistable plug-in railway relay with 2 change-over contacts. The contacts remain in the last powered position.

- Compact plug-in design
- Latching (bistable) relay, 2 C/O contacts
- 2 galvanic isolated coils
- Weld-no-transfer contacts
- Flash barrier
- 2.8 x 0.8 faston connections
- Transparant cover

Options

- Magnetic arc blow-out
- Low temperature (-40 °C)
- Gold plated contacts
- Double make / double break

Contact data

Number and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard (optional Au on Ag)**
Electrical life expectancy	**See curves on page 133**

Mechanical & environmental characteristics

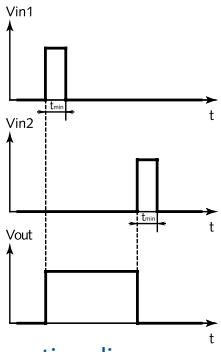
Mechanical life	30 x 10^6 operations
Weight	75 g
Operating temperature	-25 °C...+70 °C (with option -40 °C)
Humidity	90 %

Nominal voltage

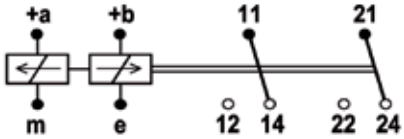
Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Rcoil * (Ω)	Inom (mA)
KCD-U201	24	16.8	30	500	48
KCD-U202	48	33.6	60	2060	23
KCD-U203	72	50.4	90	3200	15
--	110**	77.0	137.5	*	12
KCD-U205	96	67.2	120	7800	12
KCD-U206	12	8.4	15	137	88
KCD-U207	36	25.2	45	1300	29

* The Rcoil is measured at room temperature and has a tolerance of ± 10 %
** For 110 DC use KCD-U205 in series with external seriesresistor of 1800 Ω / 0.4 W
Other types on request

Timing diagram



Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U900-D

Current monitoring, 6 A, 1 C/O + 1 N/O

Miniature current monitoring railway relay with 1 change-over and 1 normally open contact. Suitable for AC and DC currents.

- Miniature plug-in / PCB-relay
- Current monitoring, 1 C/O and 1 N/O contacts
- AC or DC coil
- Very sensitive
- Weld-no-transfer contacts
- High insulation between coil and contact
- Transparant cover
- Optional positive mechanical keying relay to socket

Option

- Suitable for non-sinusoisal currents (AC only)
- Gold plated contacts

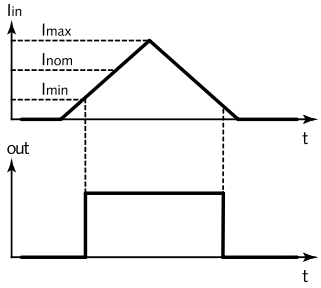
Contact data

Amount and type of contacts	1 C/O + 1 N/O
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 133**

Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram

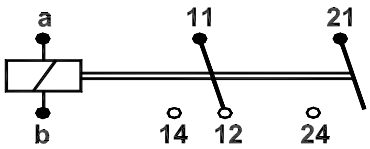


Nominal voltage

Type	Inom (VAC)	Imin (VAC)	Imax (VAC)	Udrop (VAC) at Inom - 50 Hz	Udrop (VAC) at Inom - 60 Hz
CU/CP-U952-D	1.0	0.4	1.2	1.4	1.6
CU/CP-U958-D	2.4	0.96	2.88	0.6	0.7
CU/CP-U959-D	1.5	0.6	1.8	0.9	1.1
CU/CP-U962-D	0.18	0.072	0.216	6.9	8.1

Other types on request

Connection diagram



Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

CU/CP-U900-I

Miniature, current monitoring, 6 A, 1 C/O

Miniature current monitoring railway relay with 1 change-over contact.
Suitable for AC and DC currents.

- Miniature plug-in / PCB-relay
- Current monitoring, 1 C/O contact
- AC or DC coil
- Very sensitive
- Weld-no-transfer contacts
- High insulation between coil and contact
- Transparant cover
- Optional positive mechanical keying relay to socket

Option

- Suitable for non-sinusoisal currents (AC only)
- Gold plated contacts

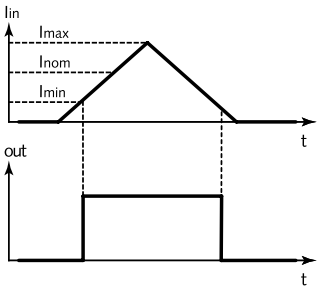
Contact data

Amount and type of contacts	1 C/O
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V (5 V with gold plated contacts)**
Minimum switching current	**10 mA (1 mA with gold plated contacts)**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 133**

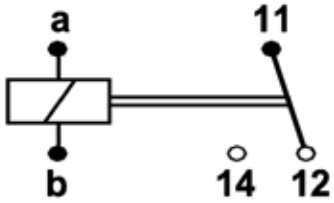
Mechanical & environmental characteristics

Mechanical life	30 x 10^6 operations
Weight	40 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Connection diagram



Nominal voltage AC versions

Type	Inom (VAC)	Imin (VAC)	Imax (VAC)	Udrop (VAC) at Inom - 50 Hz	Udrop (VAC) at Inom - 60 Hz
CU/CP-U952-I	1.0	0.4	1.2	1.4	1.6
CU/CP-U954-I	0.27	0.11	0.324	5.5	6.4
CU/CP-U955-I	0.12	0.048	0.144	11	13
CU/CP-U958-I	2.4	0.96	2.88	0.6	0.7
CU/CP-U959-I	1.5	0.6	1.8	0.9	1.1

Nominal voltage DC versions

Type	Inom (ADC)	Imin (ADCC)	Imax (ADC)	Udrop (VDC) at Inom
CU/CP-U903-I	0.39	0.156	0.59	0.93
CU/CP-U904-I	0.12	0.48	0.18	3.5
CU/CP-U908-I	4.4	1.76	6.6	0.15
CU/CP-U909-I	2.4	0.96	3.6	0.21
CU/CP-U910-I	1.5	0.6	2.25	0.26

Other types on request

Dimensions See page 132
Mounting possibilities & sockets See page 136
Detailed information and datasheets available on www.morssmitt.com

Example ordering scheme CU-platform

SERVING SAFETY

Each relay has its own ordering scheme. In this scheme all available possibilities for this relay is mentioned and can be selected. On www.morssmitt.com all datasheets for all relays are available.

Example: CU-relay

CU-U2	04	-	B	U
1. Relay model	2. Coil voltage		3. Relay type	4. Options

This example represents a **CU-U204-BU.**
Description: CU-U200 series relay (plug-in), U_{nom}: 110 VDC, relay type B, double make / double break contact

1. Relay model

CU-U2	Plug-in model
CP-U2	PCB model

2. Coil voltages

01	24 VDC
02	48 VDC
03	72 VDC
04	110 VDC
05	96 VDC
06	12 VDC
07	36 VDC
10	120 VDC

3. Relay type

B

4. Options

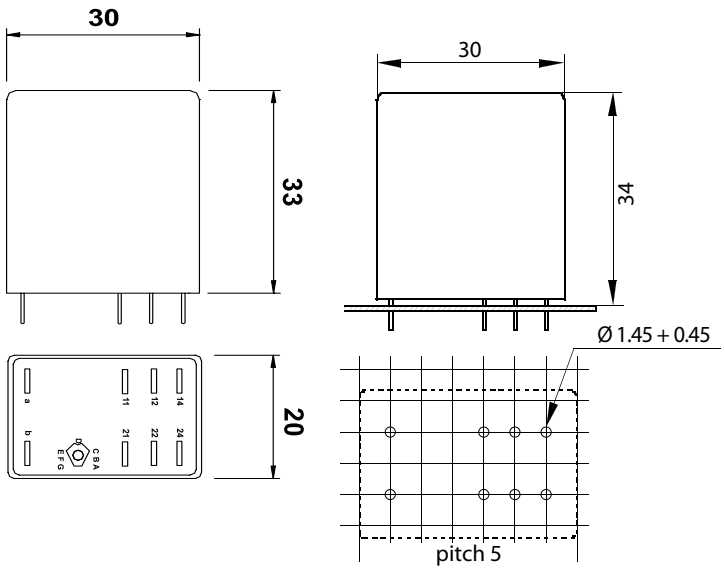
U	Double make / double break contact (1 C/O)

Upon ordering indicate keying if necessary

Dimensions

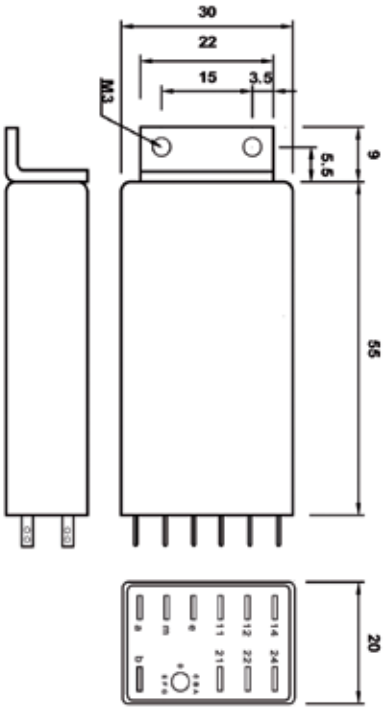
Dimensions (mm) for relay type:

- CU/CP-U200-G
- CU/CP-U300-G
- CU/CP-U200-B
- CU/CP-U200-D
- CU/CP-U200-U
- CU/CP-U300-U
- CU/CP-U900-D
- CU/CP-U900-I



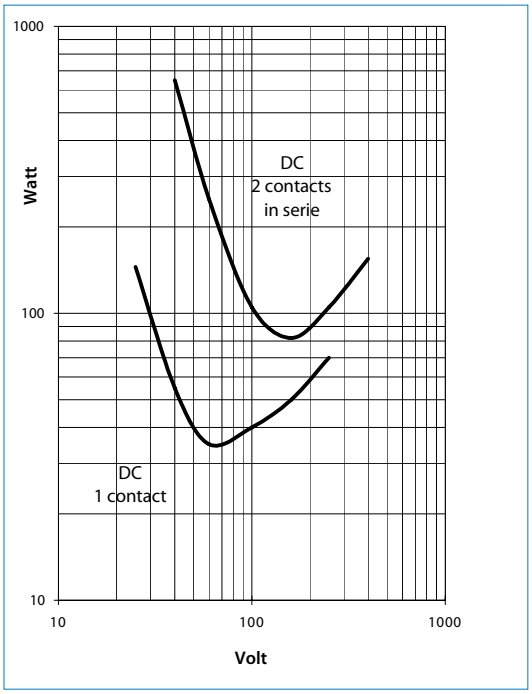
Dimensions (mm) for relay type:

- KCS/KCP-U200

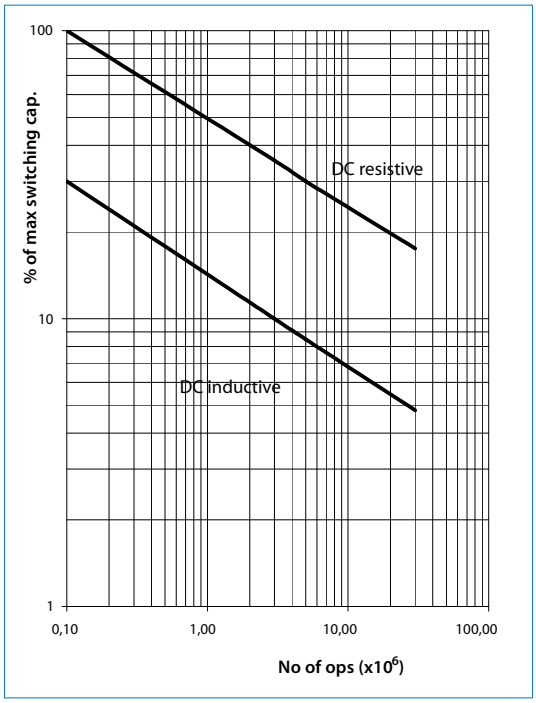


CU-platform curves 1

Maximum switching capacity



Electrical life expectancy



Step 1 Determine switching voltage out of the application

Step 2 Select the maximum switching capacity (in Watt) at this voltage in graph 'Maximum switching capacity'

Step 3 Calculate the actual switched load (in Watt) out of the application

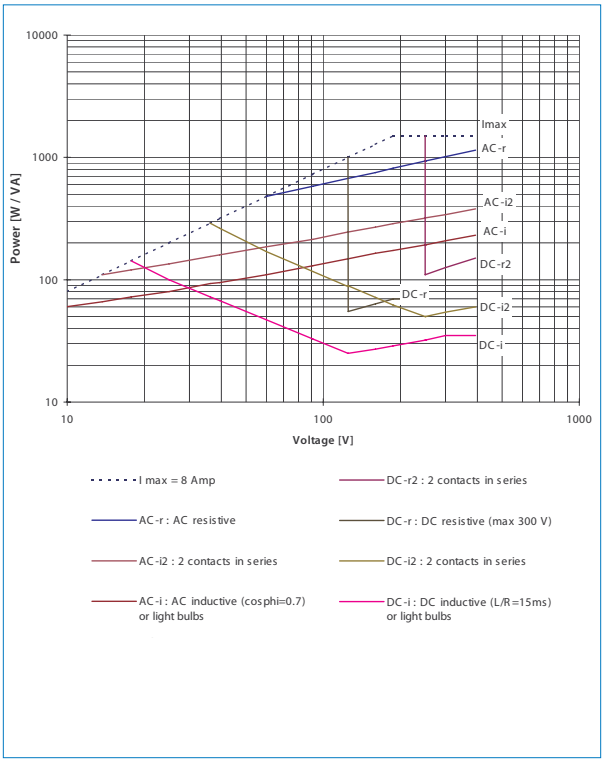
Step 4 Calculate the % of maximum switching capacity: $\frac{\text{Actual load}}{\text{Max switching capacity}}$

Step 5 Pick the life at this load out of the graph 'Electrical life expectancy'

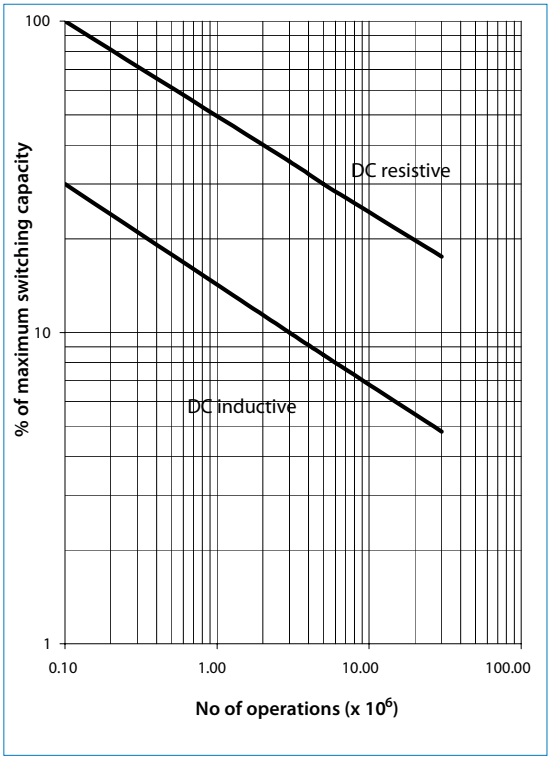
Electrical life expectancy

CU-platform curves 2

Maximum switching capacity



Electrical life expectancy



Step 1 Determine switching voltage out of the application

Step 2 Select the maximum switching capacity (in Watt) at this voltage in graph 'Maximum switching capacity'

Step 3 Calculate the actual switched load (in Watt) out of the application

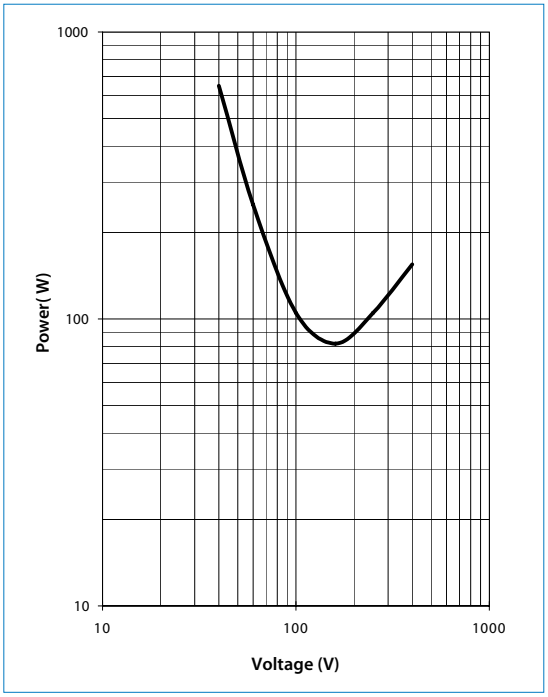
Step 4 Calculate the % of maximum switching capacity: $\frac{\text{Actual load}}{\text{Max switching capacity}}$

Step 5 Pick the life at this load out of the graph 'Electrical life expectancy'

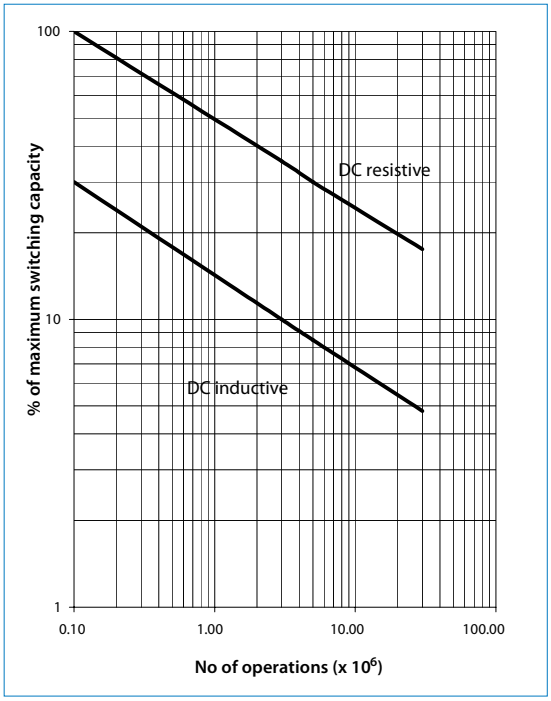
SERVING SAFETY

CU-platform curves 3

Maximum switching capacity



Electrical life expectancy



Step 1 Determine switching voltage out of the application

Step 2 Select the maximum switching capacity (in Watt) at this voltage in graph 'Maximum switching capacity'

Step 3 Calculate the actual switched load (in Watt) out of the application

Step 4 Calculate the % of maximum switching capacity: $\frac{\text{Actual load}}{\text{Max switching capacity}}$

Step 5 Pick the life at this load out of the graph 'Electrical life expectancy'

CU-platform sockets

Mounting possibilities

The relay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

V16

V17

V18

Surface / wall mounting and rail mounting

V16	Screw socket, front connection (4.0 mm²)
V16-D	Screw socket, with back EMF-diode, front connection (4.0 mm²)
V16-Q1	Screw socket, double zener diode 12 V...30 V, front connection (4.0 mm²)
V16-Q2	Screw socket, double zener diode 30 V...45 V, front connection (4.0 mm²)
V16-Q3	Screw socket, double zener diode 45 V...65 V, front connection (4.0 mm²)
V16-Q4	Screw socket, double zener diode 65 V...90 V, front connection (4.0 mm²)
V16-Q5	Screw socket, double zener diode 90 V...150 V, front connection (4.0 mm²)

Rail mounting

V17	Cage clamp socket, front connection (2.5 mm²)
V17-D	Cage clamp, with back EMF-diode, front connection (2.5 mm²)
V17-Q1	Cage clamp, double zener diode 12 V...30 V, front connection (2.5 mm²)
V17-Q2	Cage clamp, double zener diode 30 V...45 V, front connection (2.5 mm²)
V17-Q3	Cage clamp, double zener diode 45 V...65 V, front connection (2.5 mm²)
V17-Q4	Cage clamp, double zener diode 65 V...90 V, front connection (2.5 mm²)
V17-Q5	Cage clamp, double zener diode 90 V...150 V, front connection (2.5 mm²)

PCB mounting

V18	PCB-soldering socket equipped with retaining clip

Suitable for

- CU/CP-U200-B
- CU/CP-U200-D
- CU/CP-U200-G
- CU/CP-U300-G
- CU/CP-U200-U
- CU/CP-U300-U
- CU/CP-U900-D
- CU/CP-U900-I

Remark: V16, V17 and V18 are also available with 1 retaining clip.

SERVING SAFETY

C-platform

Flat multifunctional relays up to 9 change-over contacts and very long mechanical contact life of 100 million cycles. These relays all have the same base of 33 x 65 mm.

Different models are available for different applications.

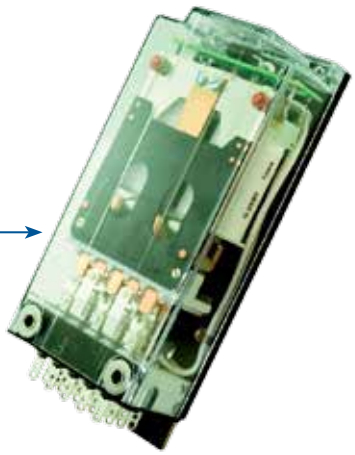
Design features

Self cleaning contacts

Silver tin oxide option, resist to welding for inductive or capacitive loads and safety-critical applications.

Contacts

Gold contact optional for dry circuit applications



Weld-no-transfer contacts

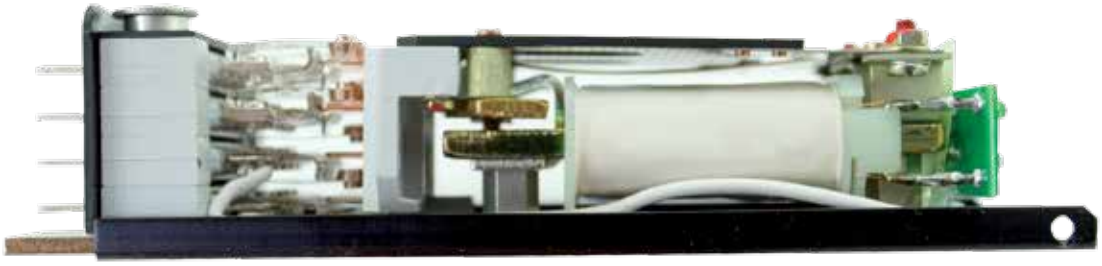
Safety design counter blade system. Relay always stays in a logic configuration. For safety-critical applications.

Cover

Transparent cover for visual check. Clear indication of type and contact arrangement.

Double make / break

Double arc extinction for high inductive or capacitive loads. Increasing electrical life. For safety-critical applications



Options

C	Weld-no-transfer	Contacts are mechanically connected in such a way that N/C contacts and N/O contacts can never be closed at the same time. - If a N/O contact fails to open and the relay de-energises, none of the N/C contacts closes - If a NC contact fails to open and the relay energises, none of the NO contacts closes
G	Goldplated contacts	Silver contacts with thin layer of gold to have a good resistance against corrosive atmospheres. Suitable for switching low currents and low voltages.
CM	Gold bifurcated and silver contacts	Three silver contacts and one bifurcated gold contact. The bifurcated contact is a two-contact finger design (contacts are in parallel) with wiping action to assure both lowest contact resistance and endurance.
V	LED indicator	Built-in LED(s) to indicate the presence of power supply and the energizing of the coil
P	Back EMF protection diode	Diode to prevent the system against a back EMF surge when the relay coil is de-energized.
S	Double zener coil protection diode	Transient voltage suppressor to protect the relay coil against surges and to protect the system against a back EMF surge when the relay coil is de-energized.
Key-ing	Mechanical keying relays to socket	Positive mechanical keying relays to socket to prevent a relay being inserted in a wrong socket.
DC / AC	Suitable for both DC and AC	Relay coil with rectifier circuit to make the relay suitable for both DC and AC

C

Safety-critical, 8 A, 9 double make / double break contacts

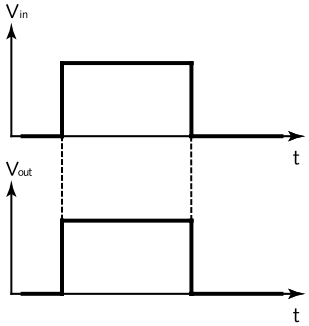
Instantaneous, safety-critical railway relay with 9 double make / double break C/O contacts in all N/O and N/C combinations.

- Plug-in design, ultra compact size
- Instantaneous, safety-critival relay
- 9 double break contacts in all N/O and N/C combinations (form X & Y - per customer specification)
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

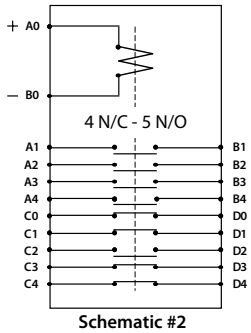
Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator

Timing diagram



Connection diagram (example)



Schematic #2

Contact data

Maximum continuous current	**8 A resistive**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**9 double make / double break contacts (form X & Y)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 149**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	400 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage

U_{nom} (VDC)	$U_{operating}$ (VDC)	P_{nom} (W)	U_{hold} (VDC)	$U_{drop-out}$ (VDC)	R_{coil} (1) (Ω)	L/R (2) (ms)
24	16 / 33	4.8	13.5	2.5	120	25
36	25 / 45	4.8	21	3.5	270	25
48	33 / 60	4.6	28.5	4.5	500	25
72	48 / 90	5.2	40.5	6.5	1000	25
100	67 / 125	5	57	9	2000	25
110	77 / 138	5	60	11.5	2400	25

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 148
Mounting possibilities & sockets See page 153
Detailed information and datasheets available on www.morssmitt.com

CG

Safet-critical, 5 A, 9 double make / double break contacts, gold plated

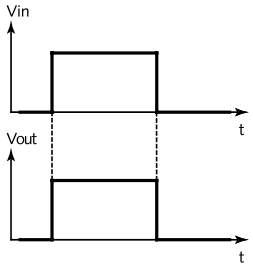
Instantaneous, safety-critical railway relay with 9 double make / double break C/O contacts in all N/O and N/C combinations, gold plated.

- Plug-in design, compact size
- Instantaneous, safety-critical relay
- 9 double break contacts in all N/O and N/C combinations, gold plated (form X & Y - per customer specification)
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

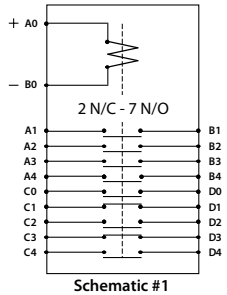
Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator

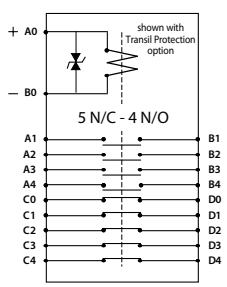
Timing diagram



Connection diagram (example)



Schematic #1



Schematic #4

Contact data

Number of contacts	**9 double make / double break contact (Form X & Y)**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC** **Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**10 mA at 12 VDC**
Contact design	**Stationary contacts: 2 single contacts (contacts are in series)** **Moveable contacts: Solid blade**
Contact material	**Stationary contacts: Gold plated over hard silver** **Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**See curves on page 149**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	400 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage

Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
24	16 / 33	4.8	13.5	2.5	120	25
36	25 / 45	4.8	21	3.5	270	25
48	33 / 60	4.6	28.5	4.5	500	25
72	48 / 90	5.2	40.5	6.5	1000	25
110	77 / 138	5	60	11.5	2400	25

Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) (ms)
220	176 / 242	4	129	21	12000	25

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 148
Mounting possibilities & sockets See page 153
Detailed information and datasheets available on www.morssmitt.com

CK

Safety-critical, 8 A, 9 double make / double break contacts

Instantaneous, safety-critical railway relay with 9 double make / double break C/O contacts in all N/O and N/C combinations.

- Plug-in design, ultra compact size
- Instantaneous, safety-critival relay
- 9 double break contacts in all N/O and N/C combinations (form X & Y - per customer specification)
- Weld resistant
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator

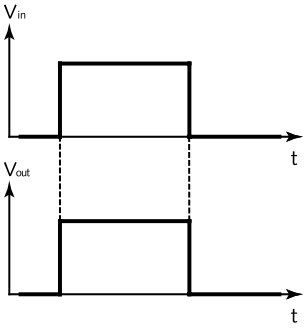
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 110 VDC and 100 mA at 24 VDC**
Number of contacts	**9 double make / double break contacts (form X & Y)**
Contact material	**Stationary contacts: tin oxide (10 %) Mobile contacts: hard silver overlay laminated to copper**
Contact resistance - initial	**30 mΩ max at 5 A**
Contact resistance - end of life	**60 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 151**

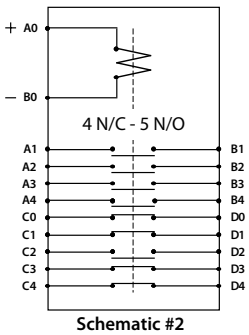
Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	400 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram (example)



Schematic #2

Nominal voltage

Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
24	16 / 33	4.8	13.5	2.5	120	25
36	25 / 45	4.8	21	3.5	270	25
48	33 / 60	4.6	28.5	4.5	500	25
72	48 / 90	5.2	40.5	6.5	1000	25
110	77 / 138	5	60	11.5	2400	25

Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (VAC)	Udrop-out (VAC)	Rcoil (1)(Ω)	L/R (2) (ms)
220	176 / 242	4	129	21	12000	25

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Dimensions See page 148
Mounting possibilities & sockets See page 153
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

CM

Power, 8 A, 4 N/C + 5 N/O contacts with 1 N/C & 1 N/O gold bifurcated contacts

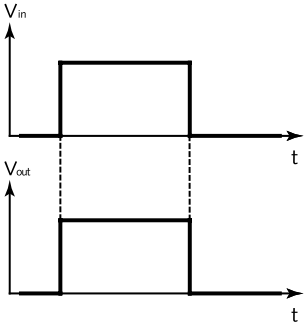
Plug-in railway relay for combined power & dry circuit applications in diesel locomotives with 4 N/C + 5 N/O double break contacts with 1 N/C & 1 N/O gold bifurcated contacts.

- Plug-in design
- Instantaneous relay for combined power & dry circuit applications in diesel locomotives
- 4 N/C + 5 N/O double break silver contacts with 1 N/O & 1 N/C gold bifurcated contacts
- Weld-no-transfer contacts standard on silver contacts
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

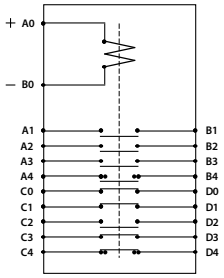
Options

- Transil coil protection
- Avalanche diode coil protection
- LED coltage indicator

Timing diagram



Connection diagram (example)



A4, B4 Gold
C4, D4 Gold
All other contacts Silver

4 NC contacts- 5 NO contacts

Contact data - silver contacts

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**9 double make / double break contacts (form X & Y)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 149**

Contact data - gold bifurcated contact

Number of contacts	**1 C/O double break contact**
Maximum contact ratings	**Operating: 20 mA maximum at 72 VDC Carry only (no make and break): 5 A maximum at 5 VDC**
Minimum current ratings	**1 mA at 5 VDC**
Contact material	**Stationary contacts: Solid gold alloy Moveable contacts: Gold over hard silver overlay laminated to copper**
Contact resistance	**≤ 20 mΩ at 5 A (carry only)**
Electrical life expectancy	**2 x 10^6 operations**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	400 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage

Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (VDC)	Udrop-out (VDC)	Rcoil (1)(Ω)	L/R (2) (ms)
72	48 / 90	5.2	24	6.5	1000	25

(1) Coil resistance tolerance: ± 8 % at 20 °C
Other types on request

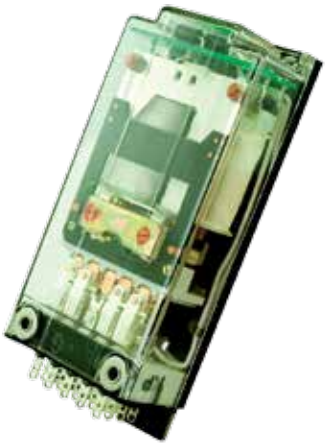
(2) Valid for closed relay

Dimensions See page 148
Mounting possibilities & sockets See page 153

Detailed information and datasheets available on www.morssmitt.com

SC

Safety-critical, 8 A, 8 N/O - N/C



Latching, safety-critical railway relay with 2 stable magnetic latched states. When 1 coil is energized, the relay actuates from magnetical latched position 1 to 2. When the other coil is energized, the relay actuates back to position 1.

- Plug-in design
- Latching relay using 2 seperate coils and magnetic rocker mechanism
- 8 N/O and N/C contacts in various combinations
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 50 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Transil coil protection

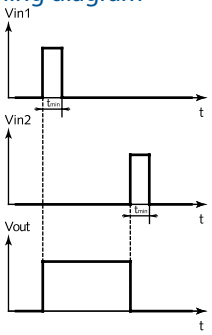
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	8 N/O and N/C contacts in various combinations
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 5 A**
Contact resistance - end of life	**40 mΩ max at 5 A**
Electrical life expectancy	**See curves on page 149**

Mechanical & environmental characteristics

Mechanical life	> 50 x 10^6 operations
Weight	500 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



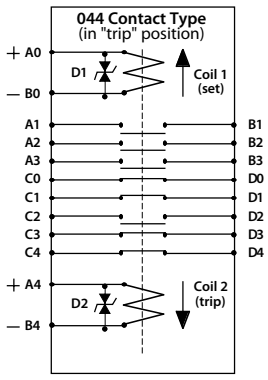
Nominal voltage

U_{nom} (VDC)	$U_{operating}$ (VDC)	P_{nom} (W)	R_{coil} (1)(Ω)	L/R (2) (ms)
24	18 / 33	3	200 ± 8 %	30
72	50 / 90	3	1800 ± 8 %	30
110	77 / 138	3	4000 ± 8 %	30

(1) Coil resistance tolerance: ± 8 % at 20 °C (2) Valid for closed relay
Other types on request

Connection diagram (example)

Schematic #1



Dimensions See page 148
Mounting possibilities & sockets See page 153
Detailed information and datasheets available on www.morssmitt.com

UTC

Voltage monitoring, one-shot, 3 A, 1 N/O

Voltage monitoring one-shot railway relay with 1 normally-open solid state contact. When a voltage impulse is given and the input voltage is higher than the voltage control threshold, the relay is activated for a predefined time

- Compact plug-in design
- Voltage control one-shot time relay
- 1 N/O solid state contact
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

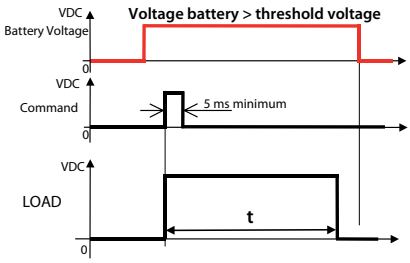
Time delay specifications

Time delay function	One-shot
Pulse time range	4 min... 60 min

Contact data

Maximum continuous current	12 A
Contact overload withstand	At 24 VDC: 10 x 200 A at L/R = 0 for 10 ms, 1 operation per minute
Minimum contact continuity	20 mA at 24 VDC
Number of contacts	4 double make / double break contacts (form Z)
Contact material	Hard silver overlay laminated to copper
Contact resistance - initial	10 mΩ max at 5 A
Contact resistance - end of life	40 mΩ max at 5 A

Timing diagram

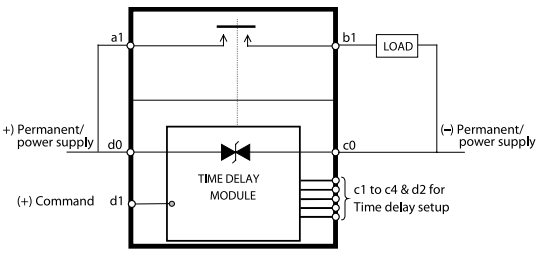


Increasing & decreasing threshold voltage diagrams in datasheet

Mechanical & environmental characteristics

Weight	450 g
Operating temperature	-40 °C...+85 °C

Connection diagram



Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)	Level 1 drop/increase (VDC)
tbd (1)	24	16 / 330	tbd (1)
tbd (1)	36	25 / 45	tbd (1)
tbd (1)	48	33 / 60	tbd (1)
5A	72	50 / 90	61 / 64
1E	110	88 / 138	tbd (1)

(1) To be defined
Other types on request

Dimensions See page 148
Mounting possibilities & sockets See page 153
Detailed information and datasheets available on www.morssmitt.com

1019

Flashing symmetrical, 2 output channels

Solid state flashing railway relay to control filament lightbulbs. The independent output channels configuration and flashing delay are factory set.

- Plug-in design
- Solid state outputs
- One or two independent output channels
- Flashing frequency varies according series
- Secure locking feature for maximum ease of maintenance

Options

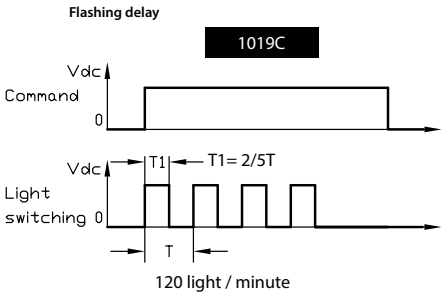
On request

Electrical characteristics

1019	C	D	E	F	G	H	J	K	L	M
Flashing rate T (1/min)	120	120	120	120	120	120	10	120	360	120
Switching on time T1 (s)	0.2	0.17	0.17	0.2	0.17	0.17	0.17	0.17	0.08	0.2
Interval time (s)	0.3	0.33	0.33	0.3	0.33	0.33	0.33	0.33	0.08	0.3
Independent channels	1	1	2	2	2	2	2	2	1	1
Light bulbs to connect	2	2	4	4	4	4	2*	2	1	2
Operating voltage range (VDC)	16-33	50-90	50-90	16-33	50-90	16-33	8-16	16-33	50-90	70-138
Nominal voltage light bulbs (VDC)	24	72	72	24	72	24	12	24	72	100
Keying	58	34	11A	158	311	5F	tbd	48B	48C	49E
Power light bulbs (W)	55-50	55-18	50-18	55-50	50-18	55	55	55-18	2	55
Maximum power (W)	115	68	2x 68	2x 115	2x 68	2x 115	70	68	68	68

* 2 + pilot light

Timing diagram (example)

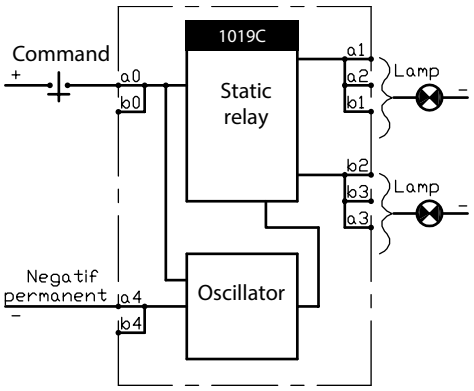


120 light / minute

Mechanical & environmental characteristics

Weight	300 g
Operating temperature	-25 °C...+70 °C
Humidity	93 % RH, 40 °C for 4 days

Connection diagram (example)



Dimensions See page 148
Mounting possibilities & sockets See page 153

Detailed information and datasheets available on www.morssmitt.com

Example ordering scheme C-platform

SERVING SAFETY

Each relay has its own ordering scheme. In this scheme all available possibilities for this relay is mentioned and can be selected. On www.morssmitt.com all datasheets for all relays are available.

Example: C-relay

CM	045 72 37	S	V	1
1. Relay model	2. Basic part number*	3. Coil OVP	4. LED indicator	5. Language (test report)

This example represents a **CM 045 72 37 S V 1**.
Description: CM series relay, contact configuration 4 N/C + 5 N/O, Unom 72 VDC, keying 37, transil coil protection, LED indicator, test report in English

1. Relay model

CM

2. Relay basic part number*

045 72 73	4 N/C + 5 N/O, 72 VDC

3. Coil overvoltage protection

–	No coil protection
P	Avalanche diode coil protection
S	Transil coil protection

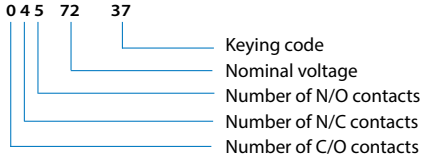
4. LED coil voltage indicator

–	No LED
V	LED voltage indicator

5. Language on test report

–	French
1	English
2	Spanish

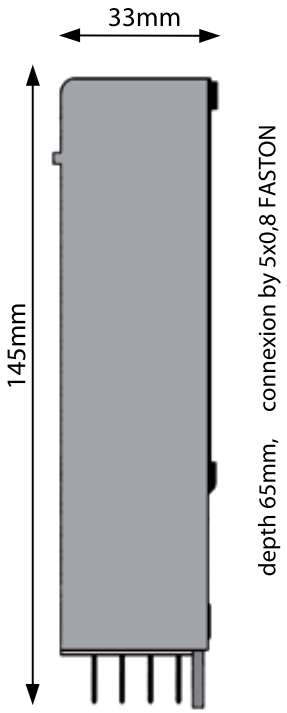
* Description part number

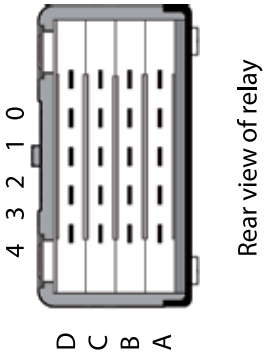


Dimensions

Dimensions (mm)
for relay type:

- **C**
- **CG**
- **CK**
- **CM**
- **SC**
- **UTC**
- **1019**





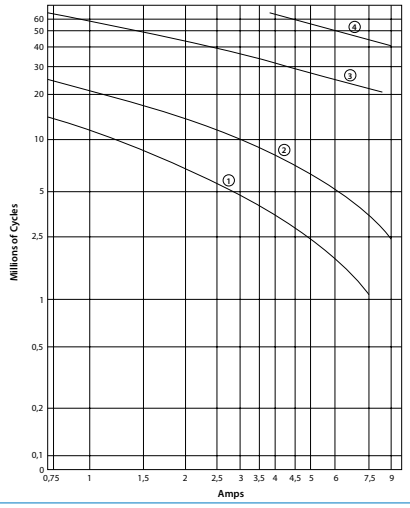
SERVING SAFETY

C-platform curves 1

Dynamic relay selection curve No 1

ıt breaking capacity versus life expectancy in millions of cycles.
ntacts opening and closing = 1200 operations per hour.
own for resistive load (Power Factor = 1).

1	2	3	4
220	125	48	24

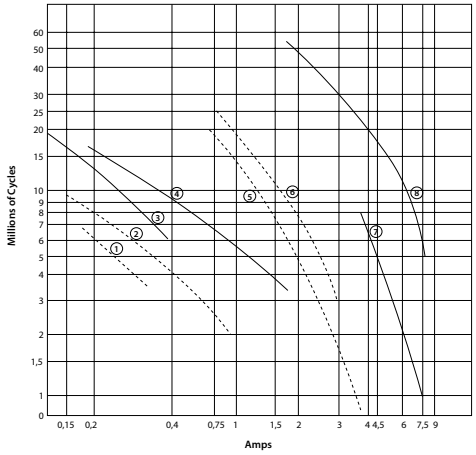


Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load:

——— L/R= 20 ms continuous current
– – – – L/R= 40 ms continuous current

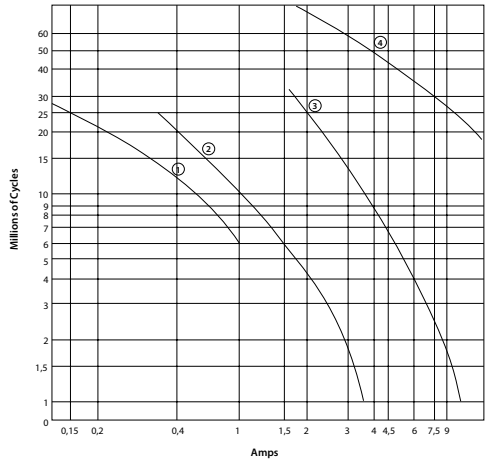
Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24



Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

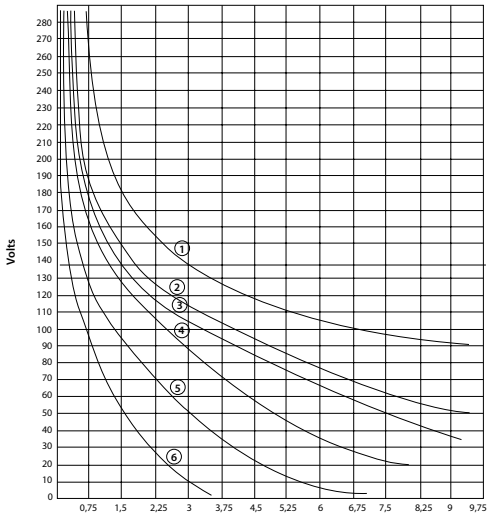
Curve	1	2	3	4
VDC	220	125	48	24



Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R.
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms



Electrical life expectancy

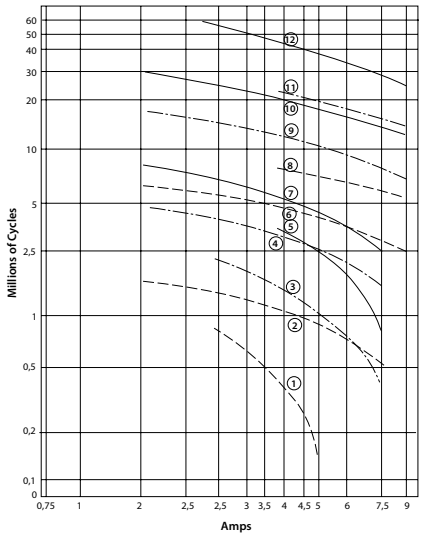
C-platform curves 1

Dynamic relay selection curve No 5

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads:

——— Cos Ø = 0.7
—·— Cos Ø = 0.5
– – – – Cos Ø = 0.3

Curves	1,3 &4	2,5 &7	6,9 &10	8,11 &12
VAC	220	125	48	24



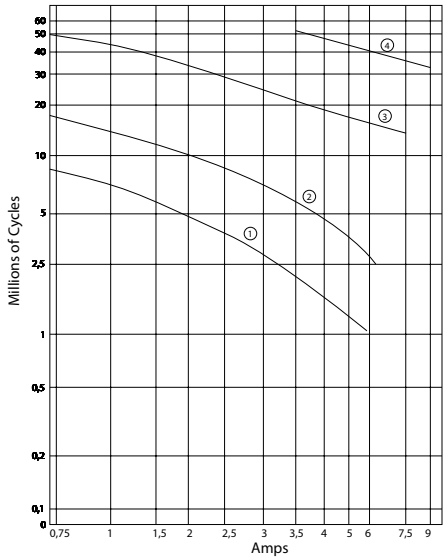
SERVING SAFETY

C-platform curves 2

Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive (Power factor = 1)

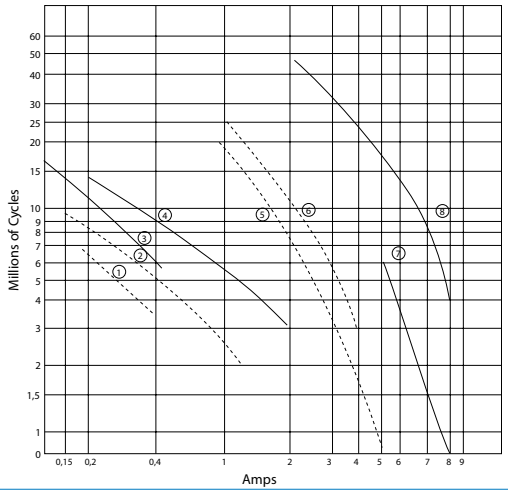
Curves	1	2	3	4
VAC	220	125	48	24



Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load -
L/R = 20 ms continuous current
L/R = 40 ms continuous current

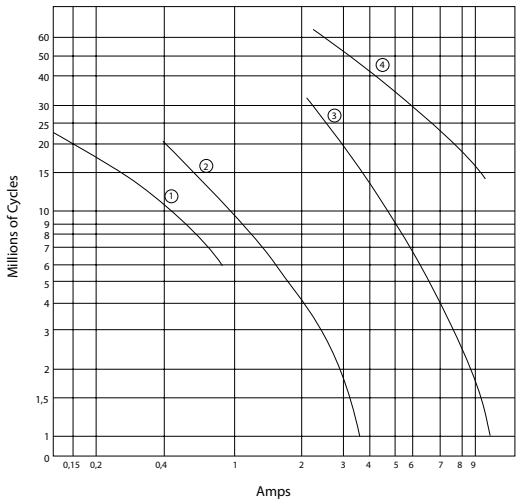
Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24



Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

Curves	1	2	3	4
VDC	220	125	48	24

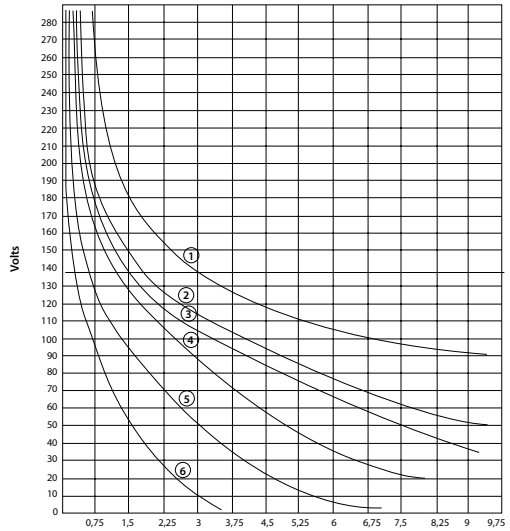


Dynamic relay selection curve No 4

Maximum contact breaking capacity versus voltage for a given L/R
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R = 0) and inductive loads. Continuous current.

Life expectancy: 800,00 cycles

Curves	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms



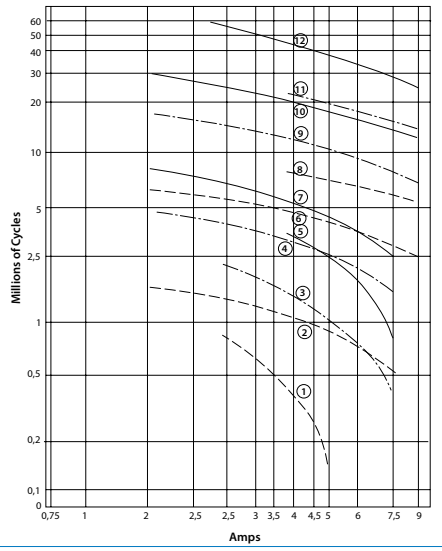
C-platform curves 2

Dynamic relay selection curve No 5

AC current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads:

——— Cos Ø = 0.7
—·— Cos Ø = 0.5
– – – Cos Ø = 0.3

Curves	1,3 & 5	2 , 4 & 6	6, 9 & 10	8, 11 & 12
VAC	220	125	48	24



SERVING SAFETY

Mounting possibilities

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

Panel / flush mounting

COR NJ **Socket with with locking spring**

Suitable for

- C
- CG
- CK
- CM
- SB
- SC
- UTC

Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

Specials

Relays with different functionalities and options for many different applications.

Ranging from 1 to 40 change-over contacts in different dimensions.

Design features

Instantaneous / latching with 19/18 N/O or N/C contacts

303

310

....with 40 N/O or N/C contacts

401

407

No auxiliary power supply necessary, connection on 35 mm rail or any other surface

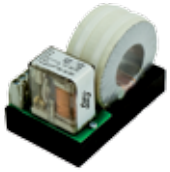
CMP

Over- and undervoltage monitoring (single or 3 phase), time delay on pull-in

NSE

NSR

Current monitoring, input via wire through ring core saturation transformer



RC19

Module consisting of 4 or8 pole relay and socket, easy replacement for contactors

D4-module

D8-module

SERVING SAFETY

303

Safety-critical, 8 A, 19 double make / double break contacts

Plug-in railway relay with 19 double break contacts in all N/O and N/C combinations

- Instantaneous, safety-critical relay
- 19 double break contact in all N/O and N/C combinations
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Plug-in design
- Secure locking feature for maximum ease of maintenance

Options

- Gold contacts
- Gold bifurcated and silver contacts

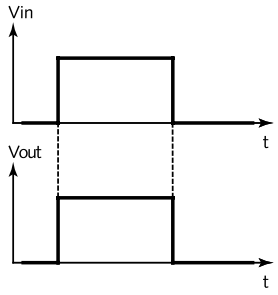
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**19 double break contacts (form X and Y)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 8 A**
Contact resistance - end of life	**40 mΩ max at 8 A**
Electrical life expectancy	**See curves on page 175**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	639 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



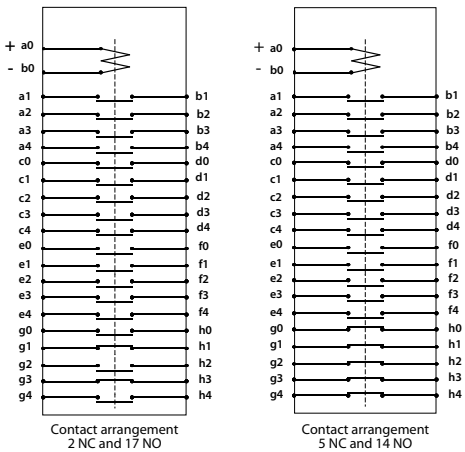
Nominal voltage

Unom (VDC)	Uoperating (VDC)	Pnom (W)	Uhold (1)(VDC)	Udrop-out (2)(VDC)	Rcoil (3)(Ω)	L/R (4)(ms)
24	16 / 33	4.8	13.5	2.5	120	25
36	25 / 45	4.8	21	3.5	270	25
48	33.5 / 60	4.6	28.5	4.5	500	25
72	48 / 90	5.2	40.5	6.5	1000	25

Unom (VAC)	Uoperating (VAC)	Pnom (VA)	Uhold (1)(VAC)	Udrop-out (2)(VAC)	R coil (3)(Ω)
220	176 / 242	4	129	21	12000

(1) Minimum assured value
(2) Maximum assured value
Other types on request
(3) Coil resistance tolerance: ± 8 % at 20 °C
(4) Valid for closed relay

Connection diagram (examples)



Dimensions See page 167
Mounting possibilities & sockets See page 174
Detailed information and datasheets available on www.morssmitt.com

310

Safety-critical, 8 A, 18 double make / double break contacts

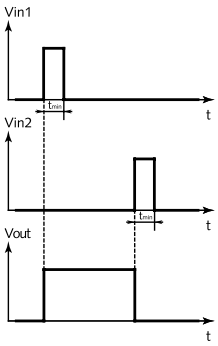
Plug-in railway relay with 2 stable magnetically latched states. Relay has 18 double break contacts in all N/O and N/C combinations.

- Plug-in design
- Latching relay with 2 separate coils and magnetic rocker mechanism
- 18 double break contact in all N/O and N/C combinations (form X and Y - per customer specification)
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

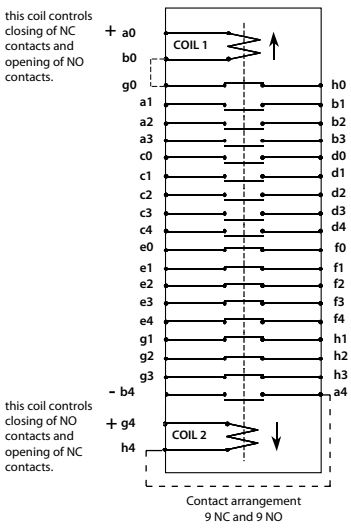
Options

- Gold contacts
- Gold bifurcated and silver contacts
- Transil coil protection
- Built-in lever to actuate relay manually

Timing diagram



Connection diagram (example)



Contact arrangement
9 NC and 9 NO

SCHEMATIC #1

Contact data

Maximum continuous current	**8 A**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**18 double break contacts (form X and Y)**
Contact material	**Hard silver overlay laminated to copper (gold contacts optional)**
Contact resistance - initial	**10 mΩ max at 8 A**
Contact resistance - end of life	**40 mΩ max at 8 A**
Electrical life expectancy	**See curves on page 175**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	639 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage

Unom (VDC)	Uoperating (VDC)	Pnom (W)	R coil (Ω) (1)	L/R (ms) (2)
36	25 / 45	5.2	250	25
72	48 / 90	5.2	1000	25
110	77 / 138	5.2	2400	25

(1) Coil resistance tolerance: ± 8 % at 20 °C
(2) Valid for closed relay
Other types on request

Dimensions See page 167
Mounting possibilities & sockets See page 174
Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

401

Safety-critical, 8 A, 40 double make / double break contacts

Plug-in railway relay with 40 double break contacts in all N/O and N/C combinations

- Plug-in design
- Instantaneous, safety-critical relay
- 40 double break contact in all N/O and N/C combinations
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Secure locking feature for maximum ease of maintenance

Options

- Transil coil protection

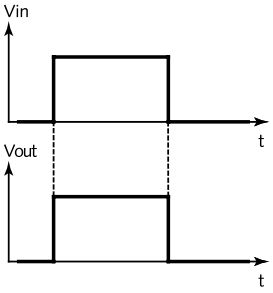
Contact data

Maximum continuous current	**8 A**
Contact overload withstand	**At 24 VDC: 10 x 160 A at L/R = 0 for 10 ms, 1 operation per minute**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**40 double break contacts (form X and Y)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 8 A**
Contact resistance - end of life	**40 mΩ max at 8 A**
Electrical life expectancy	**See curves on page 175**

Mechanical & environmental characteristics

Mechanical life	> 100 x 10^6 operations
Weight	1800 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

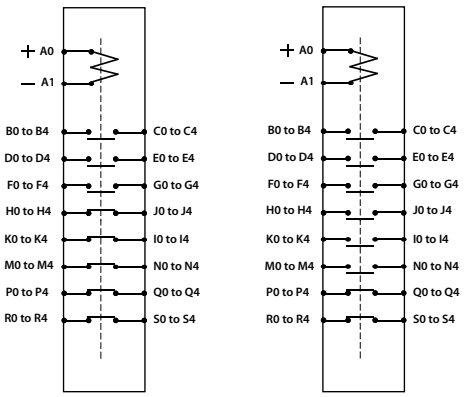


Nominal voltage

U_{nom} (VDC)	$U_{operating}$ (VDC)	P_{nom} (W)	U_{hold} (1)(VDC)	$U_{drop-out}$ (2)(VDC)	R_{coil} (3)(Ω)	L/R (4)(ms)
36	25 / 45	6	21	3.5	215	10
72	48 / 90	6.5	40.5	6.5	800	10

(1) Minimum assured value
(2) Maximum assured value
Other types on request
(3) Coil resistance tolerance: ± 8 % at 20 °C
(4) Valid for closed relay

Connection diagram (examples)



Contact arrangement
25 NC and 15 NO
SCHEMATIC #1

Contact arrangement
10 NC and 30 NO
SCHEMATIC #2

Dimensions See page 167
Mounting possibilities & sockets See page 174
Detailed information and datasheets available on www.morssmitt.com

407

Safety-critical, 8 A, 40 double make / double break contacts

Plug-in railway relay with 40 double break contacts in all N/O and N/C combinations

- Plug-in design
- Latching relay using 2 separate coils and magnetic rocker mechanism
- 40 double break contact in all N/O and N/C combinations
- Weld-no-transfer contacts standard
- Contact life (mechanical) of 100 million cycles
- Positive mechanical keying of relay to socket is done during manufacturing
- Secure locking feature for maximum ease of maintenance

Options

- Transil coil protection
- Without manual command

Contact data

Maximum continuous current	**8 A**
Minimum contact continuity	**20 mA at 24 VDC**
Number of contacts	**40 double break contacts (form X and Y)**
Contact material	**Hard silver overlay laminated to copper**
Contact resistance - initial	**10 mΩ max at 8 A**
Electrical life expectancy	**See curves on page 175**

Mechanical & environmental characteristics

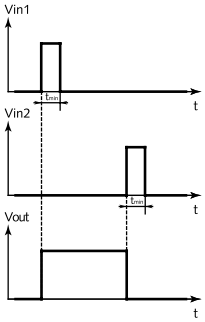
Mechanical life	> 100 x 10^6 operations
Weight	1800 g
Operating temperature	-50 °C...+70 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage

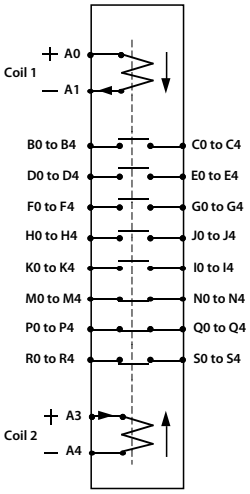
U_{nom} (VDC)	$U_{operating}$ (VDC)	P_{nom} (W)	R_{coil} (1)(Ω)	L/R_{coil} 1(2)(ms)	L/R_{coil} 2(2)(ms)
24	16 / 33	2.6	220	70	50
72	48 / 90	2.6	2000	70	50
110	75 / 138	3	4600	70	50

(1) Coil resistance tolerance: ± 8 % at 20 °C
(2) Valid for closed relays
Other types on request

Timing diagram



Connection diagram



Contact arrangement
15 NC and 25 NO

Dimensions See page 167
Mounting possibilities & sockets See page 174
Detailed information and datasheets available on www.morssmitt.com

CMP

Current monitoring, AC input, 6 A, 2 C/O

Plug-in current monitoring railway relay with 2 change-over contacts.
Suitable for AC currents (16-60 Hz) and no auxiliary power supply necessary.

- Compact plug-in design
- Current monitoring, 2 C/O contacts
- Very sensitive, very accurate
- AC input (16-60 Hz)
- No auxiliary power supply necessary
- Adjustable pull-in current via lockable knob
- Weld-no-transfer contacts
- Mounting on 35 mm rail or on any surface via 2 screws

Contact data

Amount and type of contacts	**2 C/O**
Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**10 mA**
Contact resistance	**15 mΩ**
Material	**Ag + 0.2 µm Au (gold flash is only for storage purpose)**
Maximum switching capacity and electrical life expectancy	**See curves on page 130**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	450 g
Operating temperature	-40 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Nominal voltage

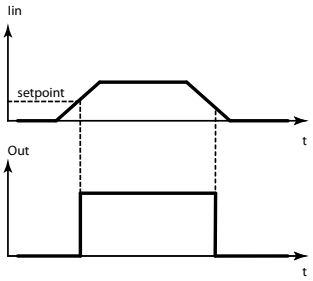
Type	I_{nom} (AAC)	Frequency (AAC)	I_{max} (AAC)
CMP 0.2 - 0.6	0.2 - 0.6	16 - 60	0.6
CMP 0.5 - 1.5	0.5 - 1.5	16 - 60	1.5
CMP 1-3	1 - 3	16 - 60	3
CMP 2-6	2 - 6	16 - 60	6
CMP 4-12	4 - 12	16 - 60	12

Other types on request

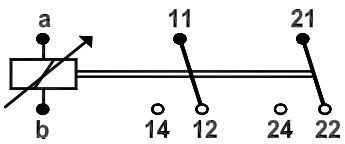
Options

On request

Timing diagram



Connection diagram



Dimensions

See page 168

Detailed information and datasheets available on www.morssmitt.com

NSE

Over- and undervoltage monitoring, delay-on, 14 A, 2 C/O

Over- and undervoltage monitoring railway relay with 2 change-over contacts. Suitable for AC 50 Hz voltages. When the relay is activated, there is a delay on pull-in.

- Over- and undervoltage monitoring relay with delay on pull-in
- Over- and undervoltage adjustable via lockable knobs
- Delay time adjustable via lockable knob
- AC input, 50 Hz, 2 C/O contacts
- Auxiliary power supply neccesary
- Auxiliary power supply failure also detected
- Screw terminals IP20
- Mounting on 35 mm rail, or on any surface via 2 screws

Time delay specifications

Time delay function	**Delay on pull-in**
Time range	**1...10 s**

Contact data

Amount and type of contacts	2 C/O
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	AgCdO

Mechanical & environmental characteristics

Mechanical life	20 x 10^6 operations
Weight	40 g
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Nominal voltage

Type	U_{nom} (VDC)	U_{max} (VAC)	Frequency (Hz)
NSE-110	110	170	50
NSE-220	220	330	50
NSE-240	240	360	50

Other types on request

Adjustment	Overvoltage	100...130 %
	Undervoltage	70...100 %

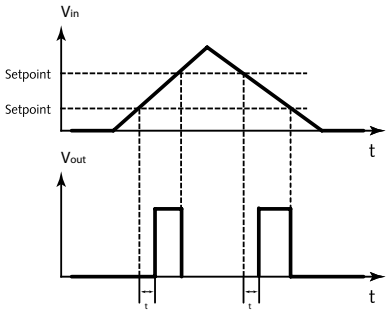
Auxiliary supply data

Type	U_{min} (VAC)	U_{max} (VAC)	f_{nom} (Hz)
L	16.5	90	0...60
H	65	270	0...60

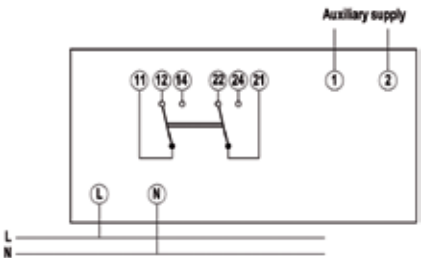
Options

On request

Timing diagram



Connection diagram



Dimensions

See page 168

Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

NSR

Over- and undervoltage monitoring, delay-on, 3-phase, 14 A, 2 C/O

Over- and undervoltage monitoring railway relay with two change-over contacts. Suitable for 3-phase 400 VAC 50 Hz. When the relay is activated, there is a delay on pull-in.

- Over- and undervoltage monitoring relay with delay on pull-in
- Over- and undervoltage adjustable via lockable knobs
- Delay time adjustable via lockable knob
- 3-phase 400 VAC input, 50 Hz, 2 C/O contacts
- Auxiliary power supply neccesary, either DC or AC (0 - 60 hz)
- Phase rotation error and auxiliary power supply failure also detected
- Screw terminals
- Mounting on 35 mm rail, or on any surface via 2 screws

Time delay specifications

Time delay function	**Delay on pull-in**
Time range	**0.5...10 s**

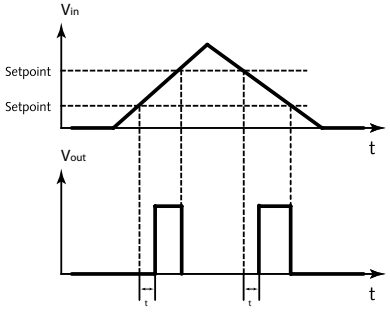
Options

On request

Contact data

Amount and type of contacts	2 C/O
Maximum make current	**14 A**
Maximum continuous current	**8 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**100 mA**
Material	AgCdO

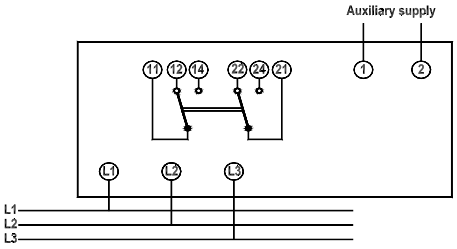
Timing diagram



Mechanical & environmental characteristics

Mechanical life	20 x 10^6 operations
Weight	40 g
Operating temperature	-25 °C...+70 °C
Humidity	95 %

Connection diagram



Nominal voltage

Type	Unom (VDC)	Umax (VAC)	Frequency (Hz)
NSR-220	220	330	50
NSR-240	240	360	50

Other types on request

Adjustment Overvoltage	100...130 %
Undervoltage	70...100 %
Phase rotation	clockwise

Auxiliary supply data

Umin (VAC)	Umin (VAC)	Umax (VAC)	fnom (Hz)
24	16.5	90	0...60

Dimensions

See page 168

Detailed information and datasheets available on www.morssmitt.com

RC-19A

Current monitoring, AC input, 6 A, 1 C/O

Current monitoring railway relay with 1 change-over contact. Suitable for AC currents. The input consists of a ring core saturation transformer.

- Compact design
- AC current monitoring relay, 1 C/O contact
- High continuous overcurrent possible
- Protection against short circuit and low impedance
- Also suitable for earth fault protection
- Easy installation

Options

On request

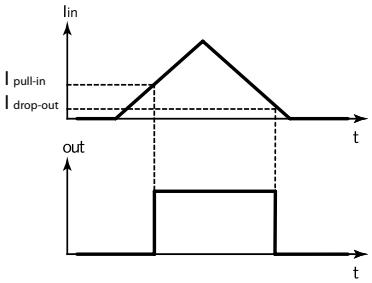
Contact data

Maximum make current	**15 A**
Maximum continuous current	**6 A**
Maximum switching voltage	**300 VDC (then max. current = 300 mA)** **250 VAC (then max. current = 2.6 A)**
Minimum switching voltage	**12 V**
Minimum switching current	**10 mA**
Maximum contact resistance	**15 mΩ**
Material	Ag + 0.2 µm Au (gold flash is only for storage purpose)
Electrical life expectancy and maximum switching capacity	**See curves on page 175**

Mechanical & environmental characteristics

Mechanical life	10 x 10^6 operations
Weight	370 g
Operating temperature	-25 °C...+70 °C
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
RC-19A 4.8	4.8	3.1 - 3.8	1.9 - 3.4
RC-19A 14	14	9.0 - 11.0	3.5 - 5.0
RC-19A 35	35	22.5 - 27.5	9.0 - 11.0

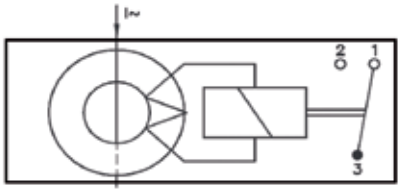
Other types on request

Example:

- Type RC-19A 4.8 with the current wire through the relay ring (no windings):
  $I_{pull\text{-}in}$ is between 3.1-3.8 A. After activating the relay $I_{drop\text{-}out}$ is between 1.9-3.4 A

- Type RC-19A 4.8 with the current wire winded 3 times around the relay ring (3 windings, wire goes through relay ring 4 times):
  $I_{pull\text{-}in}$ is between 1.0-1.3 A. After activating the relay $I_{drop\text{-}out}$ is between 0.6-1.1 A

Connection diagram



Dimensions

See page 169

Detailed information and datasheets available on www.morssmitt.com

D4-U200 module

Relay module in housing, 10 A, 4-pole, in various combinations

Form-fit-and-function solution to replace all kind of contactors with a maximum of 4 contacts. The relay module consists of an 4-pole relay, spring clamp terminal connection and a housing to fasten the module.

- Ultra compact space saving 4-pole relays module
- Heavy duty, high VDC switching
- Module consists of an 4-pole relay and housing
- Many 4-pole Mors Smitt relays combination possible
- Various contact combinations possible
- Non polarity sensitive
- Easy replacement of contactors
- Screw or spring clamp connection
- Terminals at front side

Options

- Low temperature (-50 °C)
- Gold plated contacts
- Special dust protection
- $AgSnO_2$ contacts
- No magnetic arc blow-out
- Double zener diode

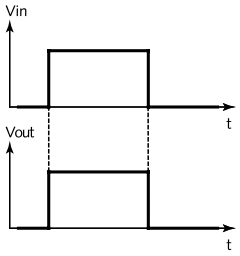
Contact data

Maximum make current	**16 A**
Maximum continuous current	**10 A for 30 min**
Maximum switching voltage	**250 VDC, 440 VAC**
Minimum switching voltage	**12 V**
Minimum switching current	**10 mA**
Maximum breaking capacity	**110 VDC, 8 A (L/R ≤ 15 ms)** **230 VAC, 10 A (cos φ ≥ 0.7)**
Contact resistance	**15 mΩ (initial)**
Material	**Ag standard (optional $AgSnO_2$, Au on Ag)**
Electrical life expectancy	**See curves on page ..**

Mechanical & environmental characteristics

Mechanical life	50 x 10^6 operations
Weight	241 g (without options)
Operating temperature	-25 °C...+70 °C (with option -50 °C)
Humidity	95 % (condensation is permitted temporarily)

Timing diagram



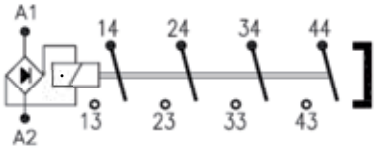
Nominal voltage

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)	Udrop-out (VDC)	Rcoil * (Ω)	Rcoil (mA)
D4-U201-xx	24	16.8	30	2.5	270	89
D4-U202-xx	48	33.6	60	4.8	1103	44
D4-U203-xx	72	50.4	90	7.2	2406	30
D4-U204-xx	110	77	137.5	11	5330	21
D4-U205-xx	96	67.2	120	9.5	4400	22
D4-U206-xx	12	8.4	15	1.2	72	167
D4-U207-xx	36	25.2	45	3.5	562	64
D4-U208-xx	120	84	150	12	6160	19

(1) The Rcoil is measured at room temperature and has a tolerance of ± 10%, with option L (LED) the value can differ.
Other types on request

Connection diagram (example)

0 N/C - 4 N/O: D4-U204-004



Dimensions

See page 170

Detailed information and datasheets available on www.morssmitt.com

D8-U200 module

Relay module with connection bracket, 8/10 A, 8 pole in various combinations

Form-fit-and-function solution to replace all kind of contactors with a maximum of 8 contacts. The relay module consists of an 8 pole relay, screw or spring clamp terminal connection and a bracket to fasten the module.

- Ultra compact space saving 8-pole relay module
- Heavy duty, high VDC switching
- Module consists of an 8-pole relay and socket
- All 8-pole Mors Smitt relays configurations possible
- Various contact combinations possible
- Non polarity sensitive
- Easy replacement of contactors
- Screw or spring clamp connection
- Terminals at front side

Options

- Gold plated contacts
- Special dust protection
- LED coil indicator
- $AgSnO_2$ contacts (only instantaneous)
- No magnetic arc blow-out
- Double zener diode
- Double make / double break
- Low 35 mm rail bracket
- High 35 mm rail bracket

Time delay specifications

Time delay function	**Delay on pull-in and instantaneous**		
Available time ranges, adjustable (xx)	**0.1...1 s**	**0.3...3 s**	**0.6...6 s**
	1...10 s	**3...30 s**	**6...60 s**
	0.3...3 min	**0.6...6 min**	**1...10 min**
	3...30 min	**6...60 min**	

Contact data

Depending on relay used

Mechanical & environmental characteristics

Depending on relay used

Nominal voltage

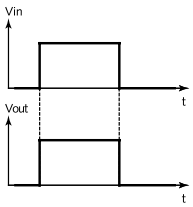
Instantaneous & Instantaneous / time delayed versions

Type	Unom (VDC)	Umin (VDC)	Umax (VDC)
D8-U201-DxxxTxxx	24	16.8	30
D8-U202-DxxxTxxx	48	33.6	60
D8-U203-DxxxTxxx	72	50.4	90
D8-U204-DxxxTxxx	110	77.0	138
D8-U205-DxxxTxxx	96	67.2	120
D8-U207-DxxxTxxx	36	25.2	45

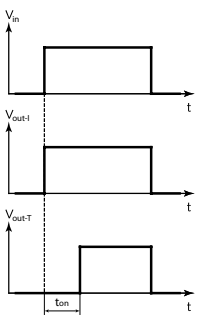
Other types on request

Timing diagram

Instantaneous



Instantaneous / time delayed



Connection diagram (examples)

D8-U200-044

D8-U200-D022T011

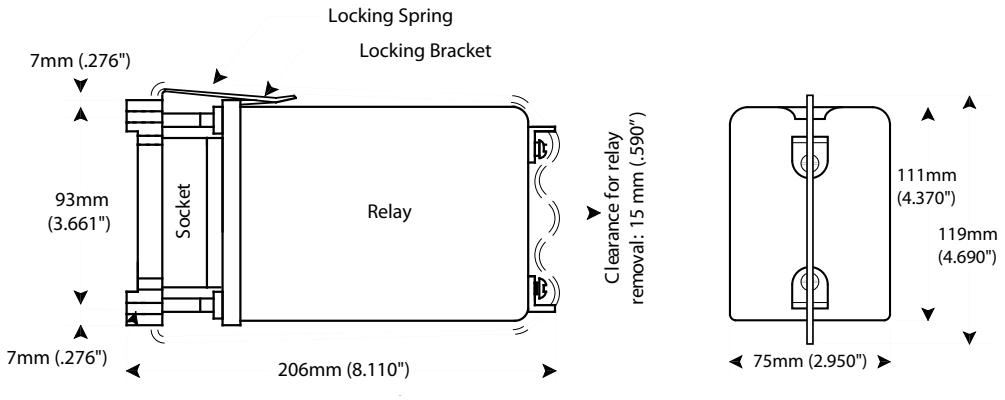
Dimensions

See page 170

Detailed information and datasheets available on www.morssmitt.com

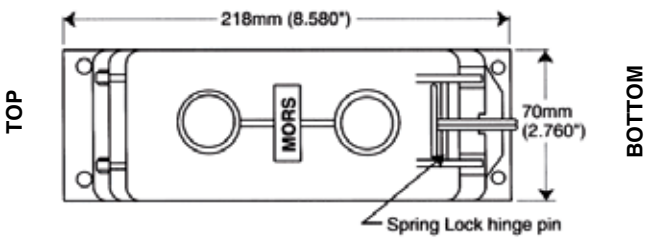
Dimensions (mm) for relay type:

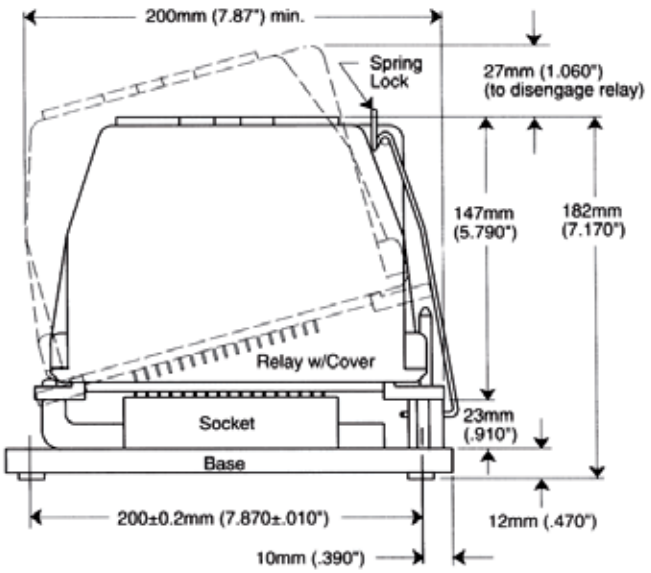
- 303
- 310



Dimensions (mm) for relay type:

- 401
- 407

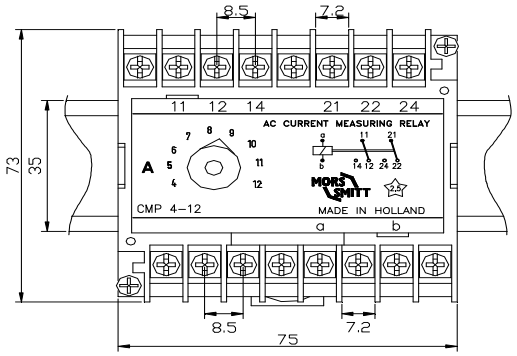


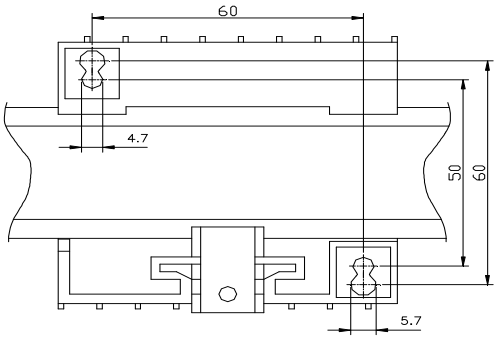


Dimensions

Dimensions (mm) for relay type:

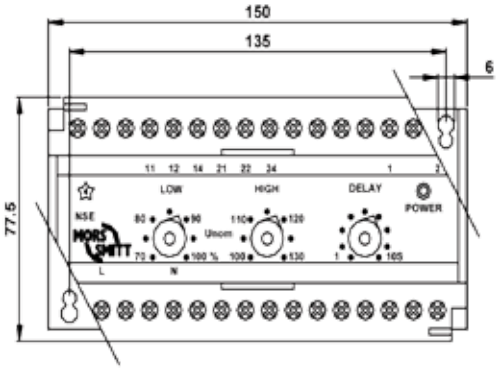
- CMP

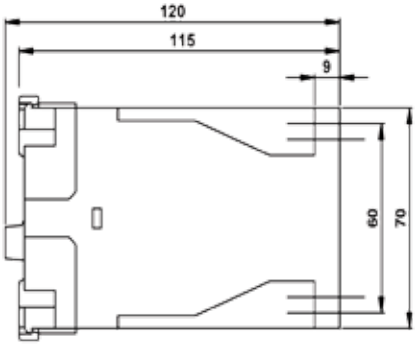




Dimensions (mm) for relay type:

- NSE
- NSR

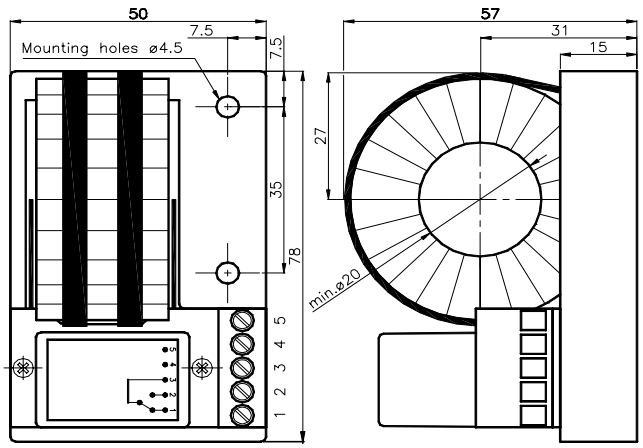




SERVING SAFETY

Dimensions (mm)
for relay type:

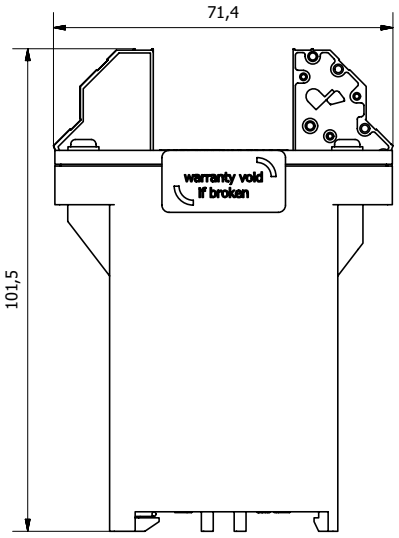
- **RC-19A**

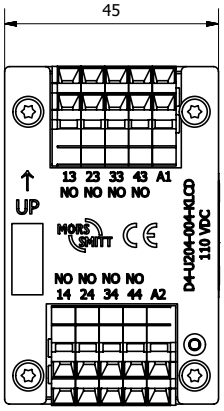


Dimensions

Dimensions (mm) for type:

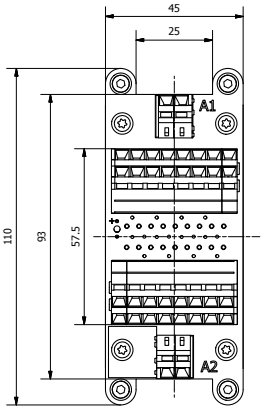
- **D4-U200 module**

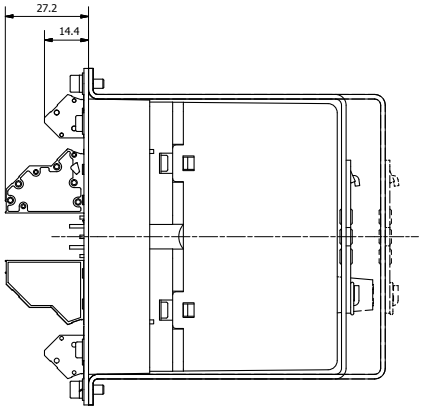




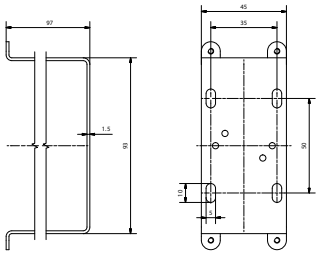
Dimensions (mm) for type:

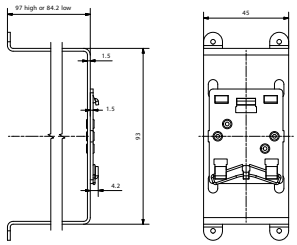
- **D8-U200 module**





Spring clamp connection





Screw mounting bracket

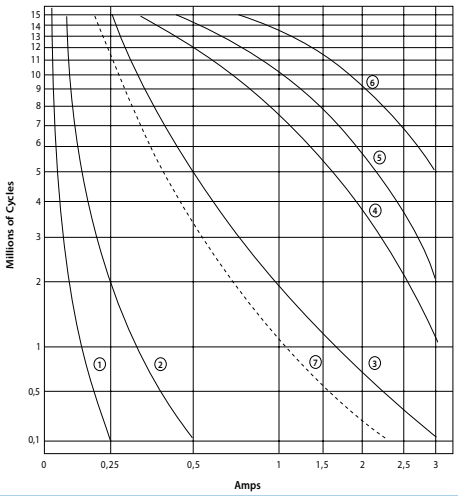
35 mm rail mounting bracket (high or low)

Electrical life expectancy

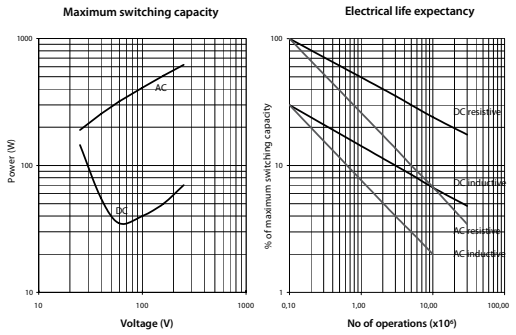
Specials curves 1

Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Duty cycle = 50%.
Unless otherwise indicated, values are for resistive circuits where L/R=0 and Cos Ø = 1.
* indicates inductive circuit with L/R = 10 ms.
** indicates inductive circuit with Cos Ø = 0.4

Curve	1	2	3	4	5	6	7
Voltage	220VDC	120VDC	48VDC 220VAC	24VDC 120VAC	12VDC 48VAC	6VDC 24VAC	48VDC* 220VAC**



Specials curves 2



Step 1 Determine switching voltage out of the application.

Step 2 Select the maximum switching capacity (in Watt) at this voltage in graph 'Maximum switching capacity'.

Step 3 Calculate the actual switched load (in Watt) out of the application.

Step 4 Calculate the % of maximum switching capacity: $\frac{\text{Actual load}}{\text{Max switching capacity}}$

Step 5 Pick the life at this load out of the graph 'Electrical life expectancy'.

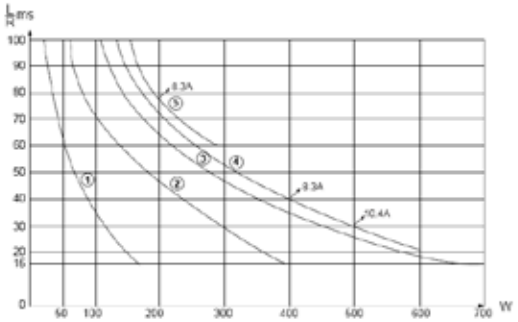
Electrical life expectancy

Specials curves 3

Dynamic relay selection curve No 1

Maximum power interruption versus load time constant (L/R) for a given voltage.
Curves shown for resistive loads. I = P/V.

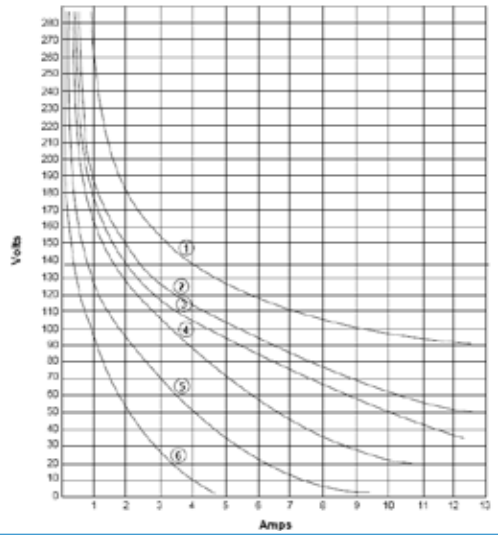
Curve	1	2	3	4	5
VDC	220	125	72	48	24



Dynamic relay selection curve No 2

Maximum contact breaking capacity versus voltage for a given L/R.
Rate of contacts opening and closing = 600 operations per hour.
Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.
Life expectancy: 2 Millions of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms

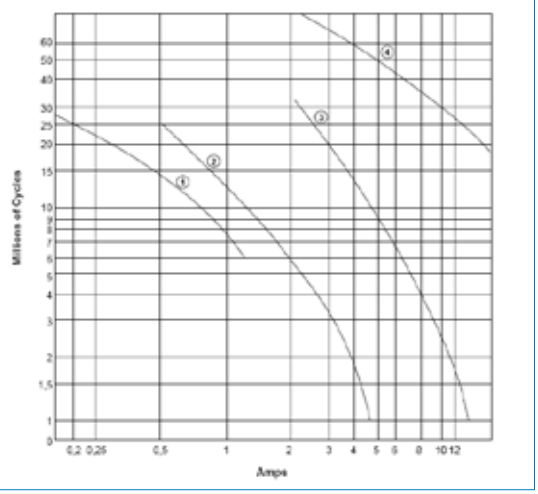


Dynamic relay selection curve No 3

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (L/R = 0). Continuous current.

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24

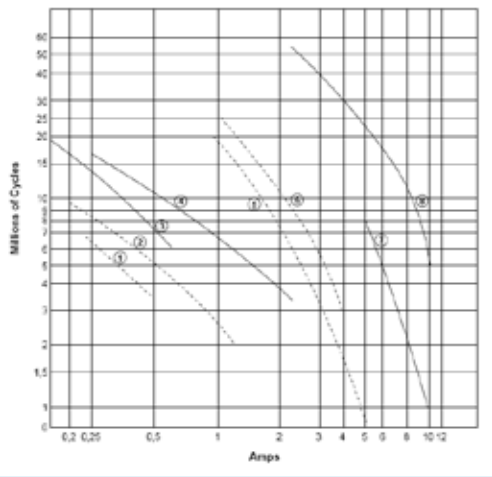


Dynamic relay selection curve No 4

DC Current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for inductive load :
——— L/R= 20 ms continuous current
- - - - L/R= 40 ms continuous current

* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-7	6-8
VDC	220	125	48	24

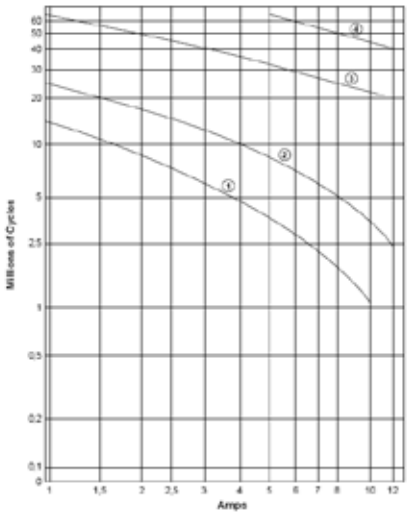


Specials curves 3

Dynamic relay selection curve No 5

AC current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24

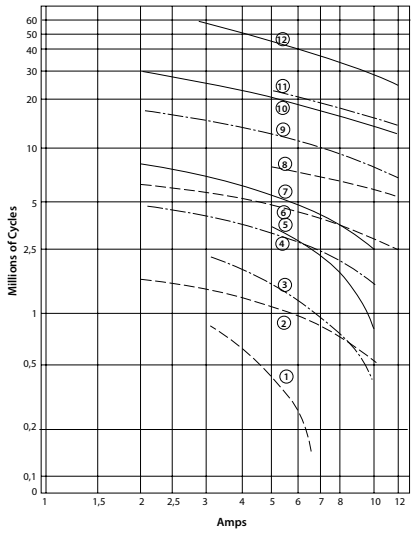


Dynamic relay selection curve No 6

AC current breaking capacity versus life expectancy in millions of cycles.
Rate of contacts opening and closing = 1200 operations per hour.
Values shown for inductive loads:

——— Cos Ø = 0.7
—·— Cos Ø = 0.5
– – – – Cos Ø = 0.3

Curves	1, 3 & 5	2 , 4 & 6	6, 9 & 10	8, 11 & 12
VAC	220	125	48	24



Specials sockets

Mounting possibilities

The rrelay sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

COR NK

COR PA

Panel / flush mounting

COR NK	**Socket without guide**
COR PA	**Socket with guide**
COR SA	**Socket without guide**

Suitable for

- 303
- 310

COR SA

COR OU

Panel / flush mounting

COR OU

Suitable for

- 401
- 407

Detailed information and datasheets available on www.morssmitt.com

SERVING SAFETY

Electronic timer modules

Time modules which convert instantaneous relay(s) into time delay relay(s).

The modules all have the same base of 45 x 45 mm and different models are available for different applications.

Electronic timer module

TB AO

Delay on pull-in

Delay on pull-in timing module offering a short range duration (0.25 s to 40 s) and controls an external load from a common source.

- Compact plug-in design
- Delay on pull-in timing module
- Short time delay range
- Delay range 0.25 s...40 s
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Options

On request

Time delay specifications

Time delay function	**Delay on pull-in**
Total time delay range	**0.25 s...40 s**
Time delay adjustment	**Fixed after connecting the terminals**

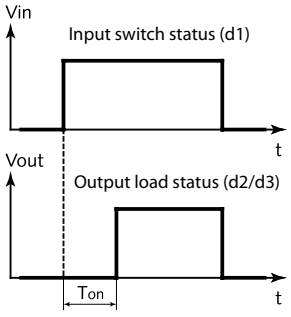
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 20 mA**
Maximum load current	**0.8 A**

Mechanical & environmental characteristics

Mechanical life	MTBF of 117.000 h
Weight	150 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

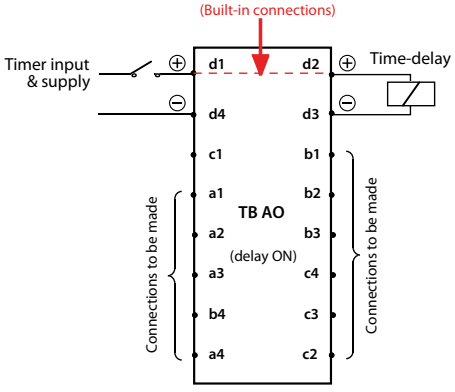


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
AH	24	17 / 33
PU	48	35 / 60
BH	72	50 / 90
EH	125	90 / 156

Other types on request

Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186

Detailed information and datasheets available on www.morssmitt.com

TB OR

Delay on drop-out

Delay on drop-out timing module offering a short range duration (0.25 s to 40 s) and controls an external load from a common source.

- Compact plug-in design
- Delay on drop-out timing module
- Short time delay range
- Delay range 0.25 s...40 s
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Time delay specifications

Time delay function	**Delay on drop-out**
Total time delay range	**0.25 s...40 s**
Time delay adjustment	**Fixed after connecting the terminals**

Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 20 mA**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Mechanical life	MTBF of 467.000 h
Weight	199 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

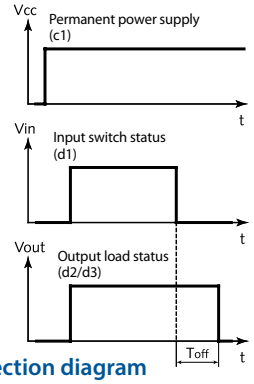
Keying	Unom (VDC)	Uoperating (VDC)
AJ	24	17 / 33
PV	48	35 / 60
BJ	72	50 / 90
EJ	125	90 / 156

Other types on request

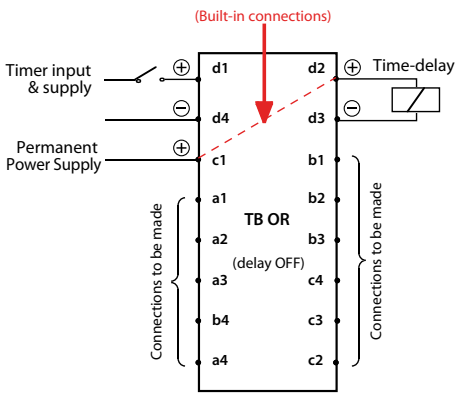
Options

On request

Timing diagram



Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186
Detailed information and datasheets available on www.morssmitt.com

Electronic timer module

TALAO

Delay on pull-in, extended delay range

Delay on pull-in timing module offering an extended range duration (0.25 s to 63.75 min) and controls an external load from a common source.

- Compact plug-in design
- Delay on pull-in timing module
- Extended time delay range with additive time combination
- Delay range 0.25 s...63.75 min
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after connecting the terminals**

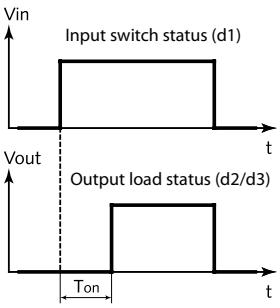
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 20 mA**
Maximum load current	**0.8 A**

Mechanical & environmental characteristics

Mechanical life	MTBF > 500.000 h
Weight	79.5 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

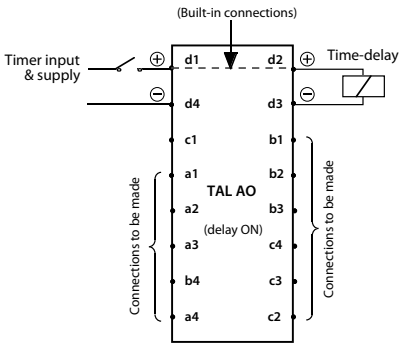


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
KE	24	16 / 33
OW	36	25 / 45
PW	48	33 / 60
HD	72	50 / 90
SW	110	77 / 138

Other types on request

Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186
Detailed information and datasheets available on www.morssmitt.com

TALOR

Delay on drop-out, extended delay range

Delay on pull-in timing module offering an extended range duration (0.25 s to 63.75 min) and controls an external load from a common source.

- Compact plug-in design
- Delay on drop-out timing module
- Extended time delay range with additive time combination
- Delay range 0.25 s...63.75 min
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after connecting the terminals**

Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 20 mA**
Maximum load current	**0.8 A**

Mechanical & environmental characteristics

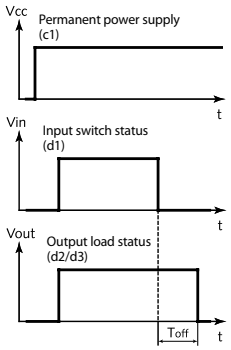
Mechanical life	MTBF > 500.000 h
Weight	79.5 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Nominal voltage & keying

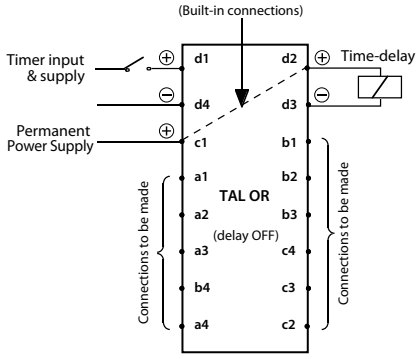
Keying	Unom (VDC)	Uoperating (VDC)
LE	24	16 / 33
OX	36	25 / 45
PX	48	33 / 60
JD	72	50 / 90
EM	110	77 / 138

Other types on request

Timing diagram



Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186

Detailed information and datasheets available on www.morssmitt.com

Electronic timer module

TBL AO

Delay on pull-in, extended delay range

Delay on pull-in timing module offering an extended range duration (0.25 s to 63.75 min) and controls an external load from a common source.

- Compact plug-in design
- Delay on pull-in timing module
- Extended time delay range
- Delay range 0.25 s...63.75 min
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on pull-in**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after connecting the terminals**

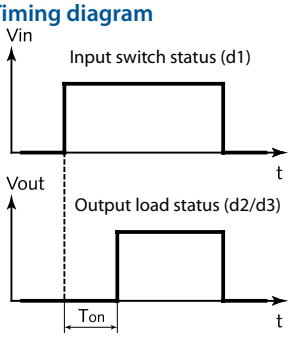
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 30 mA**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Mechanical life	MTBF of 117.000 h
Weight	199 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

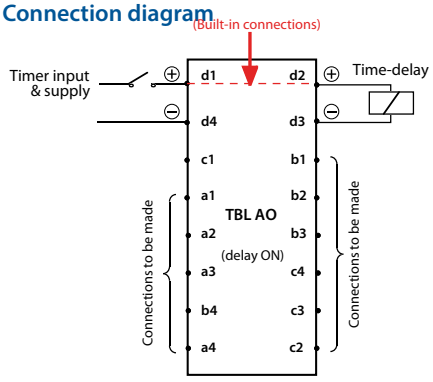


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
KE	24	17 / 33
PW	48	35 / 60
HD	72	50 / 90
SW	110	77 / 138

Other types on request

Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186
Detailed information and datasheets available on www.morssmitt.com

TBL OR

Delay on drop-out, extended delay range

Delay on drop-out timing module offering an extended range duration (0.25 s to 63.75 min) and controls an external load from a common source.

- Compact plug-in design
- Delay on drop-out timing module
- Extended time delay range
- Delay range 0.25 s...63.75 min
- Time delay programmable by external connections with additive combination
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out**
Total time delay range	**0.25 s...63.75 min**
Time delay adjustment	**Fixed after connecting the terminals**

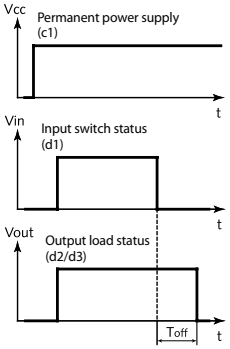
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 30 mA**
Maximum load current	**0.25 A**

Mechanical & environmental characteristics

Mechanical life	MTBF of 476.000 h
Weight	199 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

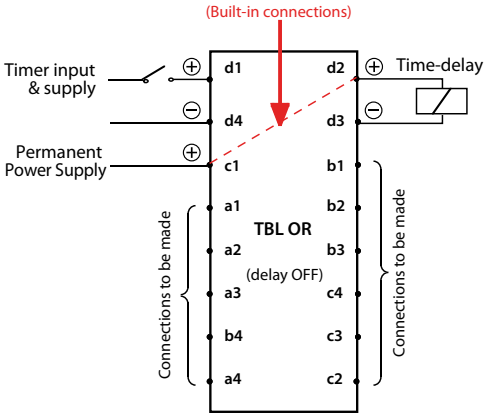


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
LE	24	17 / 33
PX	48	35 / 60
JD	72	50 / 90
EM	110	77 / 138

Other types on request

Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186

Detailed information and datasheets available on www.morssmitt.com

Electronic timer module

TA3

Delay on drop-out, parallel wiring

Delay on drop-out timing module wired in parallel. It maintains power on load during a specific time when load power is off.

- Compact plug-in design
- Delay on drop-out timing module wired in parallel
- Duration range from 0.125 s to 90 min (set in factory)
  Longer times possible upon request
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Delay on drop-out - wired in parallel**
Time range	**0.125 s...90 min (longer times possible upon request)**
Time delay adjustment	**Fixed (set in factory)**

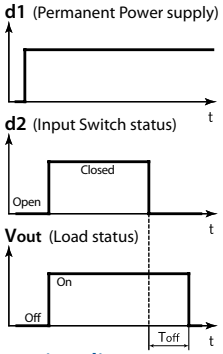
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 10 mA for 36 VDC**
Maximum load current	**0.25 A (max 4.5 W)**

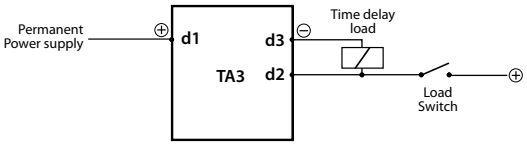
Mechanical & environmental characteristics

Mechanical life	MTBF > 400.000 h
Weight	70.9 g
Operating temperature	-40 °C...+85 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram



Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186
Detailed information and datasheets available on www.morssmitt.com

TCAL

Flashing, symmetrical

Flashing module with an extended pulse duration range (0.25 s to 63.75 min) and controls an external load form a common source.

- Compact plug-in design
- Flashing module (symmetrical)
- Extended pulse duration range with additive time combination
- Pulse duration 0.25 s ...63.75 min
- Time delay programmable by external connections
- Secure locking feature for maximum ease of maintenance

Options

- Relay cover for wire locking spring

Time delay specifications

Time delay function	**Flashing (symmetrical)**
Total time delay range	**0.25 s... 63.75 min**
Time delay adjustment	**Fixed after connecting the terminals**

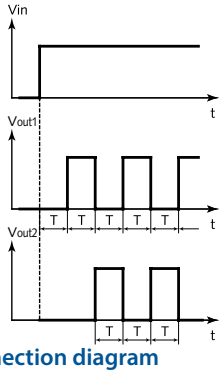
Electrical characteristics

Operating voltage	**24 VDC...110 VDC**
Operating current	**< 20 mA**
Maximum load current	**0.8 A**

Mechanical & environmental characteristics

Mechanical life	MTBF > 500.000 h
Weight	79.5 g
Operating temperature	-40 °C...+80 °C
Humidity	93 % RH, 40 °C for 4 days

Timing diagram

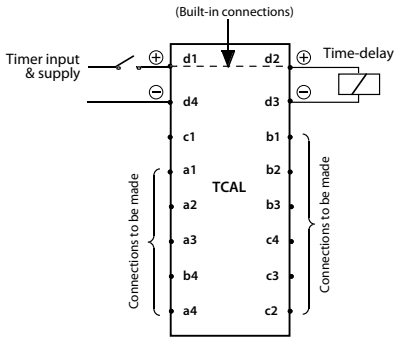


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
AM	24	16 / 30
FM	36	25 / 45
DM	48	33 / 60
BM	72	50 / 90
EM	110	77 / 138

Other types on request

Connection diagram



Dimensions See page 185
Mounting possibilities & sockets See page 186

Detailed information and datasheets available on www.morssmitt.com

Electronic timer module

TAC

Windshield wiper control module

Electronic train windshield wiper control module. The wiping sequence can easily be adjusted via a potentiometer.

- Compact plug-in design
- Train windshield wiper control module
- Wiping sequence adjustable with a potentiometer from every 3 seconds to every 30 seconds

Options

- Relay cover for wire locking spring

Time delay specifications

Wiping sequence	**Adjustable, 1 s pulse every 3 s to every 30 s**

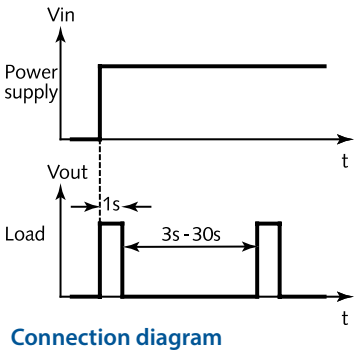
Electrical characteristics

Operating voltage	24 VDC...110 VDC
Operating current	**< 20 mA**
Maximum load current	**0.35 A**

Mechanical & environmental characteristics

Mechanical life	MTBF > 1.000.000 h
Weight	142 g
Operating temperature	-40 °C...+85 °C

Timing diagram

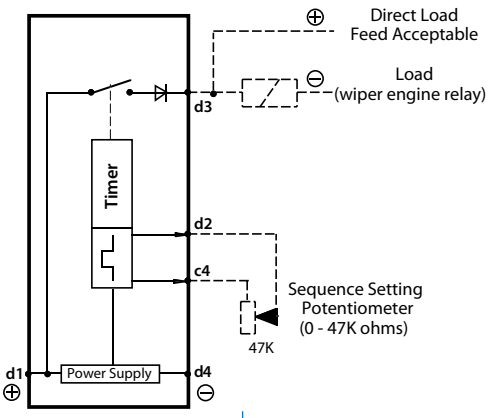


Nominal voltage & keying

Keying	Unom (VDC)	Uoperating (VDC)
UA	24	16 / 30
UB	36	25 / 45
UC	48	33 / 60
UD	72	50 / 90
UE	110	77 / 138

Other types on request

Connection diagram

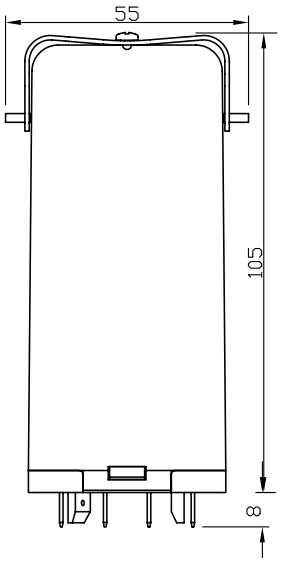


Dimensions See page 185
Mounting possibilities & sockets See page 186
Detailed information and datasheets available on www.morssmitt.com

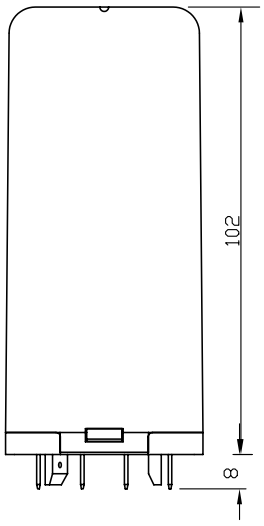
Dimensions

For electronic timer modules:

- TB AO
- TBOR
- TBL AO
- TBL OR



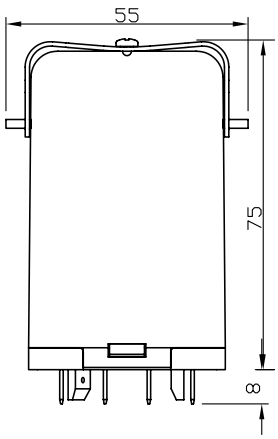
locking brackets



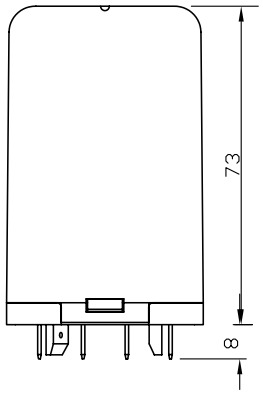
wire locking spring

For electronic timer module:

- TALAO
- TALOR
- TA3
- TCAL
- TAC



locking brackets



wire locking spring

Sockets for modules

Mounting possibilities

The module sockets are available in various sizes and connection terminals.

- Proven reliable
- Long term availability
- No maintenance
- Low life cycle cost

EA 102 A

EA 103AF

Surface / wall mounting

EA 103 AF Wire locking spring, front connection, M3 screw 6.5 mm ring terminals (2.5 mm²)
EA 105 AF Wire locking spring, front connection, single faston 5 mm

Mounting on 35 mm rail possible by adding suffix D (see socket datasheet)

Panel / flush mounting

EA 102 A Locking bracket, rear connection, double Faston 5 mm
EA 102 AF Wire locking spring, rear connection, single Faston 5 mm
EA 104 A Locking bracket, rear connection, single Faston 5 x 0.8 mm
EA 104 AF Wire locking spring, rear connection, single Faston 5 x 0.8 mm
EA 112 AF Wire locking spring, rear connection, crimp contact

EA 104 A

EA 112 AF

Suitable for

- TALAO
- TALOR
- TA3
- TCAL
- TAC

EA 102 B

EA 103 BF

Surface / wall mounting

EA 103 BF Wire locking spring, front connection, M3 screw 6.5 mm ring terminals (2.5 mm²)
EA 105 BF Wire locking spring, front connection, single faston 5 mm

Mounting on 35 mm rail possible by adding suffix D (see socket datasheet)

Panel / flush mounting

EA 102 B Locking bracket, rear connection, double Faston 5 mm
EA 102 BF Wire locking spring, rear connection, single Faston 5 mm
EA 104 B Locking bracket, rear connection, single Faston 5 x 0.8 mm
EA 104 BF Wire locking spring, rear connection, single Faston 5 x 0.8 mm
EA 112 BF Wire locking spring, rear connection, crimp contact

EA 104 B

EA 112 BF

Suitable for

- TB AO
- TB OR
- TBL AO
- TBL OR

Detailed information and datasheets available on www.morssmitt.com

Relays - alphabetical

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