

# Thermal Overload Relays

Tripping Class 20

**New**



**ABB**

## Motor Protection — general

It is very important to choose an adequate protective device for the safety of the motor during operation and for its durability. The efficiency of protection methods varies according to the application. The overview below will help you to choose. There is no general rule and we are available to advise you for special applications and especially in the case of difficult starting. An economic and effective protection are thermal overload relays with protection against:

- > Overload
- > Phase failure imbalance
- > Phase loss

## Description

- Available for starter construction with A Line contactors and separate panel mounting
- Designed for close couple mounting – separate base mounting available for all overload relays
- Full automatic function, Manual reset, Test phase or Reset can also be adjusted to function as a stop button
- Remote trip and reset option available
- Screwdriver guide holes, all terminal screws are available from the front
- Trip indication
- Ambient compensation -25 °C to +55 °C (-13 °F to +131 °F)

## Tripping classes of the thermal overload relays

Standard tripping classes are 10 A, 10, 20, 30. The tripping class indicates according to IEC 60947-4-1 the maximum tripping time in seconds under specified conditions of test at 7.2 times the setting current and specifies tripping and non tripping times for 1.5 and 7.2 times the setting current.

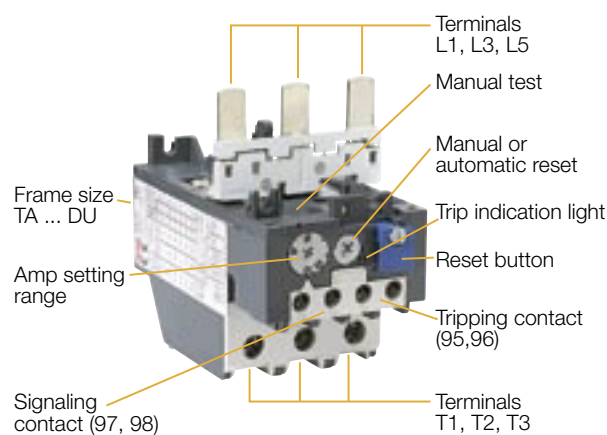
## Construction and function

### • General

Thermal O/L relays and their accessories meet UL, Nema, CSA and most other important international standards (IEC), European standards (EN) and the most important national standards. They meet the certification and approval directives required throughout the world.

Thermal overload relays are 3 pole. The motor current flows through their bimetals (1 per phase) which are indirectly heated. Under the effect of the heating, the bimetals bend, cause the relay to trip and the position of the auxiliary contacts to change. The relay setting range is graduated in amps. In compliance with international and national standards, the setting current is the motor nominal current and not the tripping current (no tripping at 1.05 x setting current, tripping at 1.2 x setting current). The tripping curves (cold or warm starting, 3 phases and 2 phases) are shown in the main catalog.

The relays are built to be self protecting in the event of an overload until the short circuit protection device is activated.



## Function of the thermal overload relays

Press blue button	Contacts	Relay tripped		Relay not tripped	
		Manual	Automatic	Manual	Automatic
	NC 95-96 NO 97-98	open closed	open closed	closed open	closed open
Button R	NC 95-96	Reset closes when Button's pressed	–	–	–
	NO 97-98	opens when Button's pressed	–	–	–
Button R/O	NC 95-96	Reset closes when Button's released	–	opens when Button's pressed closes when Button's released	opens when Button's pressed closes when Button's released
	NO 97-98	opens when Button's pressed	–	–	–

# Thermal Overload Relays with Trip Class 20

## Ordering data for the "New additional Assortment"



TA25DU



TA42DU



TA75DU



TA80DU

Ordering Details	Order code	Setting range A ... A	Max. fuse gL/gG A	Packing unit piece	Weight/ piece kg
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### TA25DU trip class 20 for contactors A9 ... A40 and (T) AL9 ... (T) AL30

TA25DU-1.8-20	1SAZ211401R1025	1.3 ... 1.8	10	1	0.170
TA25DU-2.4-20	1SAZ211401R1028	1.7 ... 2.4	16	1	0.170
TA25DU-3.1-20	1SAZ211401R1031	2.2 ... 3.1	16	1	0.170
TA25DU-4.0-20	1SAZ211401R1033	2.8 ... 4.0	20	1	0.170
TA25DU-5.0-20	1SAZ211401R1035	3.5 ... 5.0	25	1	0.170
TA25DU-6.5-20	1SAZ211401R1038	4.5 ... 6.5	25	1	0.170
TA25DU-8.5-20	1SAZ211401R1040	6.0 ... 8.5	32	1	0.170
TA25DU-11-20	1SAZ211401R1043	7.5 ... 11	40	1	0.170
TA25DU-14-20	1SAZ211401R1045	10 ... 14	50	1	0.170
TA25DU-19-20	1SAZ211401R1047	13 ... 19	63	1	0.170
TA25DU-25-20	1SAZ211401R1051	18 ... 25	80	1	0.170
TA25DU-32-20 <sup>(1)</sup>	1SAZ211401R1053	24 ... 32 <sup>(1)</sup>	100	1	0.190

<sup>(1)</sup> with terminal block DX25: 1x16mm<sup>2</sup>

### TA42DU trip class 20 for contactors A30, A40 and (T) AL30, (T) AL40

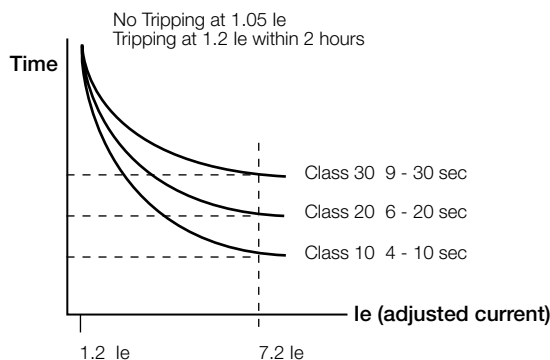
TA42DU-25-20	1SAZ311401R1001	18 ... 25	100	1	0.370
TA42DU-32-20	1SAZ311401R1002	22 ... 32	125	1	0.370
TA42DU-42-20	1SAZ311401R1003	29 ... 42	160	1	0.370

### TA75DU trip class 20 for contactors A50 ... A75 and AE50 ... AE75

TA75DU-25-20	1SAZ321401R1001	18 ... 25	100	1	0.370
TA75DU-32-20	1SAZ321401R1002	22 ... 32	125	1	0.370
TA75DU-42-20	1SAZ321401R1003	29 ... 42	160	1	0.370
TA75DU-52-20	1SAZ321401R1004	36 ... 52	200	1	0.370
TA75DU-63-20	1SAZ321401R1005	45 ... 63	200	1	0.370
TA75DU-80-20	1SAZ321401R1006	60 ... 80	250	1	0.370

### TA80DU trip class 20 for contactors A95, A110, AE 95 and AE110

TA80DU-42-20	1SAZ331401R1003	29 ... 42	160	1	0.400
TA80DU-52-20	1SAZ331401R1004	36 ... 52	200	1	0.400
TA80DU-63-20	1SAZ331401R1005	45 ... 63	200	1	0.400
TA80DU-80-20	1SAZ331401R1006	60 ... 80	250	1	0.400



# Thermal Overload Relays with Trip Class 20

## Resistances and power losses per phase

### Short-circuit protection

Setting range from ... to A A	Short-circuit protection (fuses)		UL Fuse/600V K5 A	UL 600V CB A	Resistance per phase  mOhm	Power loss per phase  at upper current setting W
	Type „2“ co-ordination  gL/gG A	Type „1“ co-ordination  gL/gG A				
<b>Thermal overload relay TA25DU trip class 20</b>						
1.3 ... 1.8	10	25	6	-	670.3	2.2
1.7 ... 2.4	16	25	10	-	381	2.2
2.2 ... 3.1	16	25	10	-	235.3	2.3
2.8 ... 4.0	20	25	15	-	140.7	2.3
3.5 ... 5.0	25	25	20	-	91.2	2.3
4.5 ... 6.5	25	25	25	-	54.5	2.3
6.0 ... 8.5	32	32	35	-	32.1	2.3
7.5 ... 11	40	40	45	-	15.5	1.9
10 ... 14	50	50	60	-	12	2.4
13 ... 19	63	63	60	-	6.3	2.3
18 ... 25	80	80	70	-	4.7	3.0
24 ... 32	100	100	100	-	3.2	3.3
<b>Thermal overload relay TA42DU trip class 20</b>						
18 ... 25	100	160	80	80	5.5	3.43
22 ... 32	125	160	100	80	2.89	2.91
29 ... 42	160	160	150	80	1.84	3.24
<b>Thermal overload relay TA75DU trip class 20</b>						
18 ... 25	100	160	80	80	5.5	3.43
22 ... 32	125	160	100	80	2.89	2.91
29 ... 42	160	160	150	80	1.84	3.24
36 ... 52	200	200	175	125	1.3	3.51
45 ... 63	200	250	200	125	0.936	3.72
60 ... 80	250	250	250	125	0.615	3.94
<b>Thermal overload relay TA80DU trip class 20</b>						
29 ... 42	160	160	150	80	1.84	3.24
36 ... 52	200	200	175	125	1.3	3.51
45 ... 63	200	250	200	125	0.936	3.72
60 ... 80	250	250	250	150	0.615	3.94

Type „1“ co-ordination according to IEC 60947-4-1: Under short-circuit conditions, the starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

Type „2“ co-ordination according to IEC 60947-4-1: Under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and shall be suitable for further use. The risk of contact welding is recognized, in which case the manufacturer shall indicate the measures to be taken as regards the maintenance of the equipment

**Standard technical data, operating data and dimensions see TA...Relay Main Catalog**

# Thermal Overload Relays with Trip Class 20

## Technical data

### Short-circuit ratings

Voltage 480 V	Type	Setting range A ... A	5 kA		10 kA		18 kA	
			Fuse K5	CB	Fuse K5	CB	Fuse K5	CB
TA25DU	TA25DU-1.8-20	1.3 ... 1.8	6	-	6	on request	6	-
	TA25DU-2.4-20	1.7 ... 2.4	10	-	10		10	-
	TA25DU-3.1-20	2.2 ... 3.1	10	-	10		10	-
	TA25DU-4.0-20	2.8 ... 4.0	15	-	15		15	-
	TA25DU-5.0-20	3.5 ... 5.0	20	-	20		20	-
	TA25DU-6.5-20	4.5 ... 6.5	25	-	25		25	-
	TA25DU-8.5-20	6.0 ... 8.5	35	-	35		35	-
	TA25DU-11-20	7.5 ... 11	45	-	45		45	-
	TA25DU-14-20	10 ... 14	60	-	60		60	-
	TA25DU-19-20	13 ... 19	60	-	60		60	-
	TA25DU-25-20	18 ... 25	70	-	70		70	-
TA42DU	TA25DU-32-20	24 ... 32	100	-	100	100	-	
	TA42DU-25-20	18 ... 25	80	80	80	150	-	
	TA42DU-32-20	22 ... 32	100	80	100	150	-	
TA75DU	TA42DU-42-20	29 ... 42	150	80	150	200	-	
	TA75DU-25-20	18 ... 25	80	80	80	150	-	
	TA75DU-32-20	22 ... 32	100	80	100	150	-	
	TA75DU-42-20	29 ... 42	150	80	150	200	-	
	TA75DU-52-20	36 ... 52	175	125	175	250	-	
	TA75DU-63-20	45 ... 63	200	125	200	250	-	
TA80DU	TA75DU-80-20	60 ... 80	250	125	250	250	-	
	TA80DU-42-20	29 ... 42	150	80	150	150	-	
	TA80DU-52-20	36 ... 52	175	125	175	175	-	
	TA80DU-63-20	45 ... 63	200	125	200	250	-	
	TA80DU-80-20	60 ... 80	250	150	250	250	-	

Voltage 600 V	Type	Setting range A ... A	5 kA		10 kA		18 kA	
			Fuse K5	CB	Fuse K5	CB	Fuse K5	CB
TA25DU	TA25DU-1.8-20	1.3 ... 1.8	6	-	6	on request	6	-
	TA25DU-2.4-20	1.7 ... 2.4	10	-	10		10	-
	TA25DU-3.1-20	2.2 ... 3.1	10	-	10		10	-
	TA25DU-4.0-20	2.8 ... 4.0	15	-	15		15	-
	TA25DU-5.0-20	3.5 ... 5.0	20	-	20		20	-
	TA25DU-6.5-20	4.5 ... 6.5	25	-	25		25	-
	TA25DU-8.5-20	6.0 ... 8.5	35	-	35		35	-
	TA25DU-11-20	7.5 ... 11	45	-	45		45	-
	TA25DU-14-20	10 ... 14	60	-	60		60	-
	TA25DU-19-20	13 ... 19	60	-	60		60	-
	TA25DU-25-20	18 ... 25	70	-	70		70	-
TA42DU	TA25DU-32-20	24 ... 32	100	-	100	100	-	
	TA42DU-25-20	18 ... 25	80	80	80	150	-	
	TA42DU-32-20	22 ... 32	100	80	100	150	-	
TA75DU	TA42DU-42-20	29 ... 42	150	80	150	200	-	
	TA75DU-25-20	18 ... 25	80	80	80	150	-	
	TA75DU-32-20	22 ... 32	100	80	100	150	-	
	TA75DU-42-20	29 ... 42	150	80	150	150	-	
	TA75DU-52-20	36 ... 52	175	125	175	175	-	
	TA75DU-63-20	45 ... 63	200	125	200	250	-	
TA80DU	TA75DU-80-20	60 ... 80	250	125	250	250	-	
	TA80DU-42-20	29 ... 42	150	80	150	150	-	
	TA80DU-52-20	36 ... 52	175	125	175	175	-	
	TA80DU-63-20	45 ... 63	200	125	200	250	-	
	TA80DU-80-20	60 ... 80	250	150	250	250	-	

# Thermal Overload Relays with Trip Class 20

## Table for tripping time

Tripping times of thermal overload relays as a function of a multiple of the setting current from cold state (tolerance +/- 20% of the tripping time).

Setting range	Tripping times of thermal overload relays: at multiple of setting current					
	3	4	5	6	7.2	8
from ... to A A	Tripping times in sec					

Thermal overload relays TA25DU trip class 20						
1.3 ... 1.8	47.1	27	20.3	15.8	12.7	11.5
1.7 ... 2.4	43.3	25	18.9	14.4	11.9	10.4
2.2 ... 3.1	47.5	28	20.8	16	13.1	11.8
2.8 ... 4.0	45.6	27	19.8	15.3	12.5	11
3.5 ... 5.0	47.8	29	21.2	16	13.2	11.8
4.5 ... 6.5	47.4	28	20.3	15.5	12.5	11
6.0 ... 8.5	46.1	27	20	15	11.7	10
7.5 ... 11	42.3	25	17.8	14.1	10.9	10.5
10 ... 14	39.4	25	16.8	13	9.9	8.5
13 ... 19	38.1	21	13.6	10	7.4	6.2
18 ... 25	44.4	25	16.1	11	9	8
24 ... 32	44.4	27	17.7	13	9.8	8.5
Thermal overload relays TA42DU, TA75DU, TA80DU trip class 20						
18 ... 25	51.6	29	20.3	15	11.7	10
22 ... 32	67.9	38	26.9	20	14.8	12.5
29 ... 42	58.8	33	22.5	16	12.2	10.3
36 ... 52	59.9	34	22.7	16	12.3	10.5
45 ... 63	65.8	34	22.4	16	12.4	10.5
60 ... 80	71.9	35	23.4	17	13.9	12



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