# **② 国で承 3120-N... Thermal Circuit Breaker**

## **Description**

The 3120 thermal circuit breaker/switch combination unites overcurrent protection and the function of an ON/OFF switch within a single component. The trip element is a thermal bimetal. Type 3120 is ideally suited for overload protection of motors, pumps, transformers and cables. After tripping, it can reliably, easily and quickly be reset. The positively trip-free mechanism ensures reliable disconnection of the circuit even with the actuator blocked.

#### Versions upon request:

- ON/OFF switch without overcurrent protection according to the relevant standard for switches for appliances IEC/EN 61058
- thermal-magnetic version for an additional short circuit protection



Medical and laboratory equipment, apparatus and machine construction, professional tools, household and garden appliances, offices machines, audio equipment, machine tools

## **Features**

- Single or double pole thermal circuit breaker/switch combination
- Voltage ratings: AC 240 V, DC 50 V
- Current rating range: 0.1 ... 20 A (up to 30 A upon request)
- Optional: push-in terminals for easy and quick wiring with a long-term stability
- Functional extension options with add-on modules for low voltage release, auxiliary contact function or remote trip



## **Your benefits**

- Maximum equipment availability is ensured by overload protection perfectly matched with the loads (prevention of nuisance tripping) and quick resettability
- Reduced mounting and wiring time
- Spacesaving design
- Reduced disposition and storage costs
- Increased overall reliability

# **Approval logos**











# **Compliances**





### **Further information**

The current data sheet is available on our website: www.e-t-a.de/d016

# **Technical data**

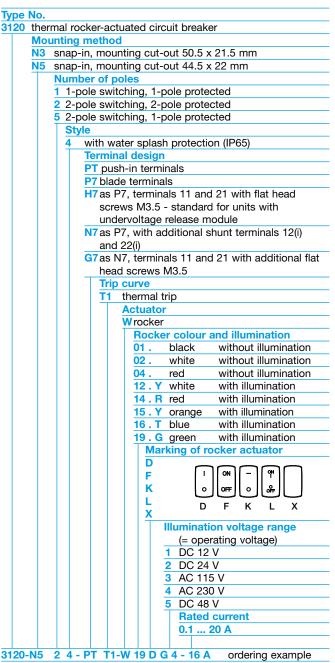
Voltage ratings		AC 240 V, DC 50 V				
Current rating range		(AC 415 V upon request) 0.1 20 A				
3 3			30A upon request	for single pole		
Typical life 1-p	ole					
AC 240 V:	0.120 A	30,00	0 operations at 1	x I <sub>N</sub> , inductive		
DC 50 V:	0.14 A 4.516 A	30,00	0 operations at 1 0 operations at 1	x I <sub>N</sub> , inductive		
DC 28 V:	0.120 A		0 operations at 1			
Typical life 2-p	ole	•	•	147		
AC 240 V:	0.116 A 1720 A		0 operations at 1			
DC 50 V:	0.116 A 1720 A	50,00	0 operations at 1	operations at 1 x $I_N$ , inductive operations at 1 x $I_N$ , inductive operations at 1 x $I_N$ , inductive		
Ambient tempe	rature		+60°C (-22 +14			
Insulation coord	dination		/2 reinforced insu	lation at		
Dielectric stre	ngth	•				
operating area pole to pole (2-	pole)		Itage AC 3,000 V Itage AC 1,500 V			
Insulation resist			MΩ (DC 500 V)			
Interrupting cap	acity Icn (	IEC/EN	60934)			
	I <sub>N</sub>		U <sub>N</sub>	I <sub>cn</sub>		
1-pole, 2-pole	0.1	2 A	AC 240 V / DC 50 V	10 x I <sub>N</sub>		
1-pole	2.5	10 A	DC 50 V	50 A		
1-pole	2.5	20 A	AC 240 V / DC 28 V	200 A		
2-pole	2.5	20 A	DC 50 V	250 A		
2-pole	2.5	20 A	AC 240 V / DC 28 V	300 A		
Interrupting cap	acity I <sub>nc</sub> (L	JL 1077	)			
	I <sub>N</sub>	l	U <sub>N</sub>	I <sub>nc</sub>		
1-pole, 2- pole			AC 250 V	5,000 A, C,		
1-pole, 2- pole		20 A	DC 50 V	1,000 A, C,		
Degree of protection (IEC 60529)			ing area IP65 ing area IP65 al area IP00	, , ,		
Vibration		8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis				
Shock	k		30 g (11 ms) test to IEC 60068-2-27, test Ea			
Corrosion	ion		96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka			
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab					
Mass	approx. 30 g (1-pole) approx. 34 g (2-pole) approx. 45 g (2-pole with PT terminals					

# **Current ratings and internal resistance values**

Current rating (A)	Internal resistance per pole (Ω)	Current rating (A)	Internal resistance per pole (Ω)
0.1	94	4	0.0435
0.2	24	4.5	0.0435
0.3	12	5	0.0325
0.4	5.30	6	0.0215
0.5	4.20	7	0.0165
0.6	2.90	8	0.0165
0.8	1.50	10	< 0.02
1	0.9	12	< 0.02
1.2	0.80	14	< 0.02
1.5	0.45	15	< 0.02
2	0.27	16	< 0.02
2.5	0.0785	18	< 0.02
3	0.0595	20	< 0.02
3.5	0.0565		

# **② 国际** 3120-N... Thermal Circuit Breaker

# Order numbering code

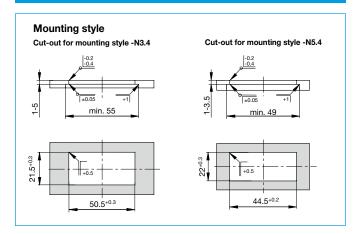


Please observe our minimum ordering quantities.

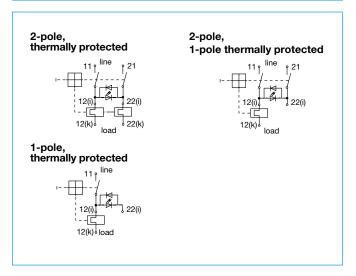
## **Custom designed versions**

Looking for a version you cannot find in our ordering number code? Please get in touch. We will be pleased to find a solution for you.

# **Mounting method**



# **Schematic diagrams**



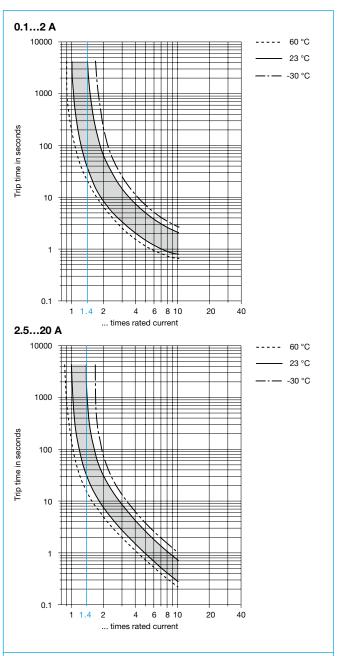
# **②EFA** 3120-N... Thermal Circuit Breaker

# **Approvals**

Approval authority	Standard	Voltage ratings	Current rating range	Approval logos
VDE	IEC/EN 60934	AC 240 V DC 50 V DC 50 V DC 28 V	0.1 A 20 A 0.1 20A (2-pole) 0.1 16 A (1-pole) 0.1 A 20 A	<b>₽</b>
UL	UL 1077	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A 16 A (TC1, OL1) 17 A 20 A (TC1, OL0) 0.1 A 20 A (TC1, OL0) 30 A* (TC1, OL0)	<b>37</b> .
CSA	C22.2 No 235	AC 250 V AC 250 V DC 50 V AC 250 V	0.1 A 16 A (TC1, OL1) 17 A 20 A (TC1, OL0) 0.1 A 20 A (TC1, OL0) 30 A* (TC1, OL0)	∰_
CQC	GB 17701	AC 240 V DC 50 V	0.1 A20 A 0.1 A20 A	<b>(W)</b>
KTL	KC6094	AC 240 V	0.120 A (2-pole)	

<sup>\* 2</sup> poles in parallel

# **Time/current characteristics**

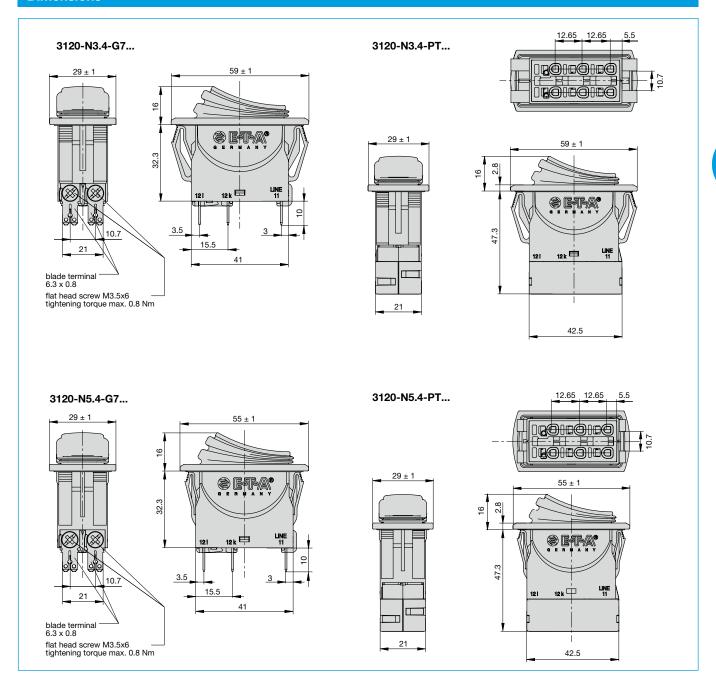


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating by a derating factor. For further details please see: www.e-t-a.de/ti\_e

ambient temperature [°C]	-30	-20	-10	0	23	40	50	60
temperature factor	0.8	0.84	0.88	0.92	1	1.08	1.14	1.23

# **② 国际**A 3120-N... Thermal Circuit Breaker

# **Dimensions**

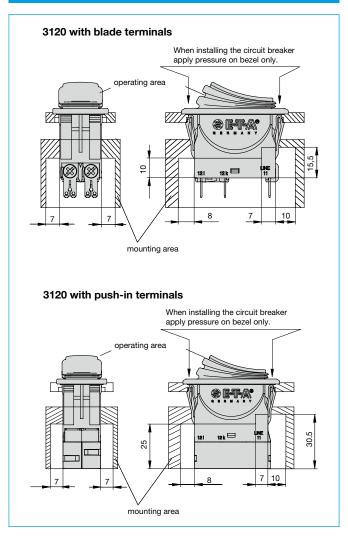


# ❷ 国际风 3120-N... Thermal Circuit Breaker

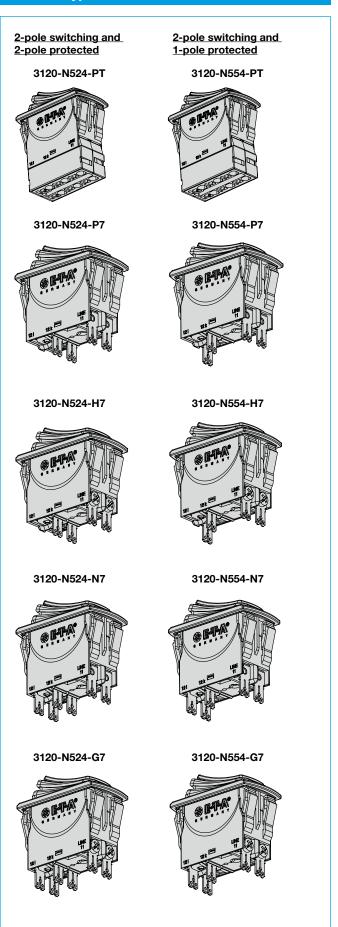
# Cable cross sections PT terminals

Cable	cross section with direct push-in wiring
Rigid	14 mm <sup>2</sup> (stripping length: 10 mm)
Flexible with wire end ferrule (with or without plastic sleeve)	0.52.5 mm <sup>2</sup>
Cable	cross section when opening the push-in terminals
Rigid	0.54 mm <sup>2</sup> (stripping length: 10 mm)
Flexible without wire end ferrule	0.52.5 mm <sup>2</sup>

# **Installation drawing**



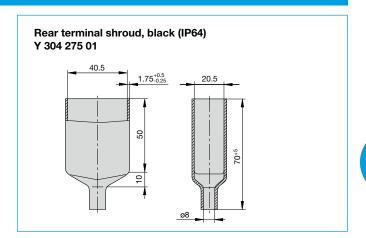
# **Terminal types**



# ❷ [□ □ A 3120-N... Thermal Circuit Breaker

# **Accessories**

# Insulated cover Y 303 068 01 Terminal adapter Y 303 862 01 blade terminals 6.3 x 0.8 Blanking piece in -N3 frame Y 303 885 31 25 54 31 16.5 36 33 41 21 Spacer for 3120-N3... Spacer for 3120-N5... Y 303 675 01/02 Y 303 676 01 58 52 50.5 22.5 22 28 28 sharp-edged without bends $^{\star}$ Y 303 675 01 suitable for panel thickness < 2 mm $^{\star}$ Y 303 675 02 suitable for panel thickness < 4 mm



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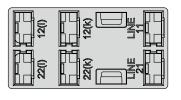
# ❷ 国际 3120-N... Thermal Circuit Breaker

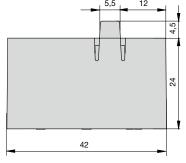
# **Accessories**

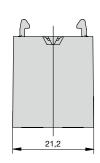
# Plug-in connector

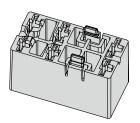
#### Y 31214001

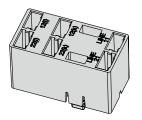
Connecting cables can be pre-wired. Two retaining clips ensure a tight fit.











#### Benefits:

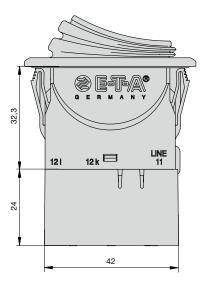
- Reduced installation time and costs for final assembly
- Quick replacement of devices

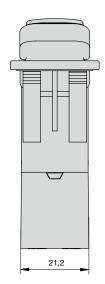
#### Note:

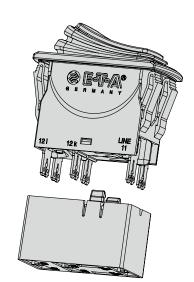
Delivery without receptacles.

Dimensions of receptacles (width 6.3 mm) are in accordance with DIN 46340 part 3, shape A. Examples of suitable receptacles: Stocko RSB 7916 F6,3-1 / Klaucke type 2730 / Vogt type 3832d.67 / TE FASTON Terminals 250 Series / Delphi Packard 58 Series

Plug-in connector mounted on circuit breaker:







# 

# Description X3120-U undervoltage release module

The undervoltage release module reliably excludes personal injury through automatic re-start after voltage dip or power failure.

In the event of voltage dip or power failure, the undervoltage release module trips the circuit breaker. The rocker actuator will go into centre position. The breaker can be reset in two steps:

Step 1: Switch rocker into OFF position.

Step 2: Reset circuit breaker.

**Note:** Basic unit 3120-...-H7 or -G7 requires screw terminals. Not possible in combination with PT terminals.

#### **Typical applications**

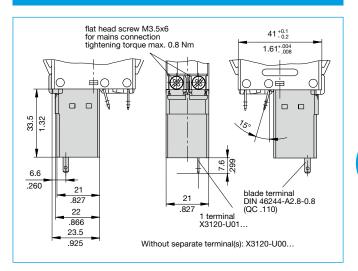
All machines that could cause personal injury upon automatic re-start, e.g. drilling machines, electric saws, meat cutting machines etc.

# Order numbering code

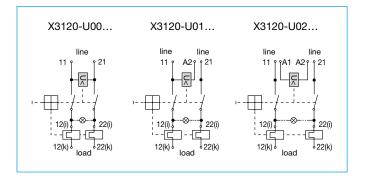
#### Type No. X3120 module for type 3120 **Module** U undervoltage release module Design 00 standard (without separate connections) 01 1 blade terminal 2.8x0.8 02 2 blade terminal 2.8x0.8 Voltage ratings 00 AC 230/240 V 50/60 Hz 01 AC 120 V 50/60 Hz 02 AC 100 V 50/60 Hz 03 DC 24 V 04 AC 400 V 50/60 Hz 05 AC 42 V 50/60 Hz Supply status M module mounted to circuit breaker 3120 X3120- U 00 00 M ordering example

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## **Dimensions**



# **Schematic diagrams**



# **Technical data**

Voltage ratings:	AC 42 V; 100 V; 120 V; 230/240 V; 400 V (50/60 Hz) DC 24 V
Voltage tolerances	+ 10 %/- 15 %
Typical life	20,000 cycles
Current consumption	approx. 2.5 mA
Release values	$0.2 \times U_N < U < 0.7 \times U_N$ (at a rated voltage of AC 100 V the device can trip at 70 V and must trip at 20 V)
Trip time	< 20 ms
Latch-in values	≥ 85 % U <sub>N</sub>
Ambient temperature	-30 +60°C (-22 +140°F)
Vibration	8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	48 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 56 g (including base unit)

# **②巨小** 3120-N... Thermal Circuit Breaker

## Description X3120-S auxiliary contact module

Add-on module for circuit breaker type 3120-F. The auxiliary contact module has a change-over contact as signal contact and is operated with actuation of the CBE.

Note: Not possible in combination with PT terminals.

## **Typical applications**

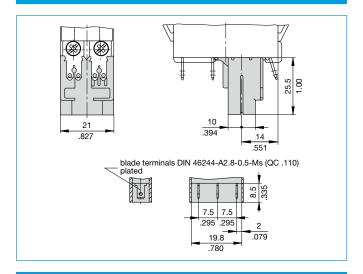
Status monitoring of CBE and/or the connected loads.

## Order numbering code

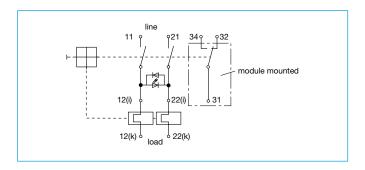
Type No.		
X3120 module t	for type 3120	
Module		
s auxili	ary contact module	
Cont	act configuration	
0 ch	ange-over contact	
Te	rminal design	
<u>1</u>	blade terminals DIN 46244	4-A6.3-0.8
	Contact rating	
	A AC 10 V – AC 250 V	0.1 4 A
	DC 12 V	0.1 4 A
	DC 24 V	0.1 4 A
	DC 60 V	0.1 1 A
	DC 110 V	0.1 0.5 A
	DC 220 V	0.1 0.25 A
	B AC 5 V – AC 250 V	5 100 mA
	DC 5 V – DC 250 V	5 100 mA
	Supply status	
	M module mounted to	circuit breaker 3120
X3120-S 0 1	A M	ordering example

<sup>\*</sup> without approval mark

## **Dimensions**



## **Schematic diagram**



#### **Technical data** AC 250 V, DC 250 V Voltage ratings 0.1...4 A / 5...100 mA Rated current 50,000 cycles Endurance -30...+60 °C (-22 ... +140°F) Ambient temperature Dielectric strength between main and test voltage AC 3,000 V auxiliary circuit Insulation resistance > 100 MOhm (DC 500 V) Vibration < 6 g (57-500 Hz), ± 0.46 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis Shock test to IEC 60068-2-27, test Ea Corrosion 96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka Humidity 240 hrs in 95 % RH test to IEC 60068-2-78, test Cab Mass approx. 41 g (including base unit)

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# ❷ ছিন্দিঐ 3120-N... Thermal Circuit Breaker

# **Description X3120-M remote trip module**

A module which adds remote trip capability to all versions of type 3120-F. A voltage applied across the coil will cause trip of the main switch/circuit breaker mechanism.

Note: Not possible in combination with PT terminals.

## **Typical applications**

Electrical remote trip of safety systems.

## Order numbering code

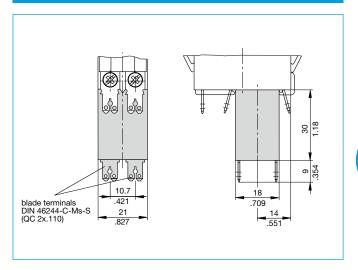
Type No.
X3120 module for type 3120
Module
M magnetic trip module
Design
2 magnetic remote trip coil
Terminal design
P7 blade terminals DIN 46244-A6.3-0.8
Supply status
M module mounted to circuit breaker 3120
Voltage ratings
AC 120, 230 V
DC 12, 24 V
X3120- M 2 P7 M -12 V ordering example

# Standard voltage ratings and typical internal resistance values

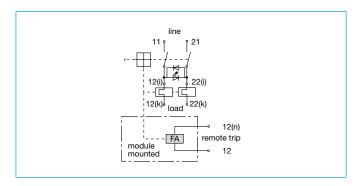
Voltage ratings	Internal internal resistance (Ω)	Voltage ratings	Internal internal resistance (Ω)
DC 12 V	0.78	AC 120 V	71.0
DC 24 V	3.3	AC 230 V	312

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## **Dimensions**



# Schematic diagram



# **Technical data**

Voltage ratings	AC 120230 V; DC 1224 V
Power consumption	approx. 200 Watt
Pulse operation	20 ms $<$ t <sub>ON</sub> $<$ 100 ms/t <sub>OFF</sub> $>$ 10 sec
Trip time	< 20 ms
Endurance	50,000 operations at $U_N$
Ambient temperature	-3060 °C (-22 +140°F)
Dielectric strength	
between main and trip current circuit	test voltage AC 3,000 V
Insulation resistance	> 100 MOhm (DC 500 V)
Vibration	8 g (57-500 Hz), ± 0.61 mm (10-57 Hz) test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	30 g (11 ms) test to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist, test to IEC 60068-2-11, test Ka
Humidity	240 hrs in 95 % RH test to IEC 60068-2-78, test Cab
Mass	approx. 56 g (including base unit)

# **Mouser Electronics**

**Authorized Distributor** 

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# E-T-A Circuit Breakers:

3120-N324-P7T1-W01D-20A 3120-N324-P7T1-W01D-5A 3120-N324-P7T1-W02D-10A 3120-N324-P7T1-W02D-15A 3120-N324-P7T1-W02D-20A 3120-N324-P7T1-W02D-5A 3120-N324-P7T1-W12DY4-10A 3120-N324-P7T1-W12DY4-5A 3120-N324-P7T1-W19DG3-10A 3120-N324-P7T1-W19DG3-15A 3120-N324-P7T1-W19DG3-20A 3120-N524-P7T1-W02D-20A 3120-N524-P7T1-W01D-15A 3120-N524-P7T1-W01D-5A 3120-N524-P7T1-W02D-10A 3120-N324-P7T1-W01D-10A 3120-N324-P7T1-W01D-15A 3120-N324-P7T1-W12DY3-5A 3120-N324-P7T1-W12DY3-10A 3120-N324-P7T1-W12DY3-15A 3120-N324-P7T1-W12DY3-20A 3120-N324-P7T1-W19DG3-5A 3120-N324-P7T1-W19DG4-10A 3120-N324-P7T1-W19DG4-5A 3120-N321-P7T1-W15F-382066-13A 3120-N323-P7T1-W01D-10A 3120-N321-P7T1-W14DR4-15A 3120-N311-P7T1-W02D-5A 3120-N321-P7T1-W19DG4-5A 3120-N321-P7T1-W02D-6A 3120-N323-P7T1-W02D-10A 3120-N323-P7T1-W01D-16A 3120-N321-P7T1-W02D-15A 3120-N321-P7T1-W19DG4-15A 3120-N311-P7T1-W02D-10A 3120-N321-P7T1-W01D-10A 3120-N321-P7T1-W01D-15A 3120-N321-P7T1-W16DT4-15A 3120-N321-P7T1-W01D-16A 3120-N321-P7T1-W16DT4-5A 3120-N321-P7T1-W14DR4-5A 3120-N311-P7T1-W02D-15A 3120-N321-P7T1-W01D-6A 3120-N321-P7T1-W01D-2A 3120-N321-P7T1-W19DG4-10A 3120-N311-P7T1-W01D-20A 3120-N321-P7T1-W14DR4-10A 3120-N323-P7T1-W01D-5A 3120-N321-P7T1-W02D-20A 3120-N323-P7T1-W02D-15A 3120-N311-P7T1-W02D-20A 3120-N321-P7T1-W02D-5A 3120-N321-P7T1-W16DT4-10A 3120-N321-P7T1-W01D-3A 3120-N321-P7T1-W01D-1A 3120-N323-P7T1-W02D-5A 3120-N321-P7T1-W02D-10A 3120-N311-P7T1-W01D-10A 3120-N323-P7T1-W01D-15A 3120-N321-P7T1-W01D-20A 3120-N321-P7T1-W01D-5A 3120-N311-P7T1-W01D-5A 3120-N524-H7T1-W02D-20A 3120-N311-P7T1-W14DR3-10A 3120-N311-P7T1-W14DR3-5A 3120-N311-P7T1-W14DR3-3A 3120-N323-P7T1-W01D-6A 3120-N524-G7T1-W19D-G4-7A 3120-N324-P7T1-W14LR3-8A 3120-N314-P7T1-W02D-2A 3120-N323-P7T1-W19DG4-6A 3120-N521-P7T1-W01D-12A 3120-N5P4-P7T1-W01D-30A 3120-N554-P7T1-W15DY3-5A 3120-N554-P7T1-W19DG3-15A 3120-N554-P7T1-W19DG3-18A 3120-N554-P7T1-W19FG3-6A 3120-N561-N7Q1-W14DR3-16A 3120-N563-N7Q1-W19XG1-16A 3120-N554-P7T1-W02D-20A 3120-N554-P7T1-W02L-20A 3120-N554-P7T1-W04D-16A 3120-N554-P7T1-W04G-10A 3120-N554-P7T1-W04G-15A 3120-N554-P7T1-W15DY3-3A 3120-N551-P7T1-W14FR3-5A 3120-N551-P7T1-W15FY3-16A 3120-N554-B2T1-W02Q-20A 3120-N554-H7T1-W02D-20A 3120-N554-H7T1-W02Q-16A 3120-N554-P7T1-W02A-3.5A 3120-N551-P7T1-W01Q-16A 3120-N551-P7T1-W01Q-6A 3120-N551-P7T1-W02C-1.2A 3120-N551 N551-P7T1-W04F-14A 3120-N551-P7T1-W12DY4-20A 3120-N551-P7T1-W14AR4-6A 3120-N524-P7T1-W19FG4-3A