

## LKM3 Series Moulded Case Circuit Breaker



LKM3-100



LKM3-160



LKM3-250



LKM3-630

### 1. Application

LKM3 series moulded case circuit breaker, it's applicable circuit of AC 50/60Hz, rated insulation voltage 690V (LKM3 125 500V), rated operating voltage AC 690V or below, rated operating current 16-1250A, for distribute energy of electric and infrequent making and breaking circuit in normal condition. The circuit-breakers are provided with the function of the protection against overload and short circuit and under-voltage. The circuit breakers comply with standard of IEC60947-2. The circuit-breakers are double insulating ( $I_{nm}=250A$  or above), the control circuit of the accessories is set apart with the main circuit, and doesn't need to open the cover of the circuit breaker when install the accessories.

### 2. Main Technical Specification

Type	LKM3-160 (T1)	LKM3-250 (T3)	LKM3-400 (T5)	LKM3-630 (T5)	LKM3-800 (T6)	LKM3-1250 /1600(T7)
Number of poles	3/4	3/4	3/4	3/4	3	3
Rated current	16-160	100-250	250-400	400-630	630-800	1000-1250
Rated operating voltage $U_e(V)50$	690	690	690	690	690	690
Rated insulation voltage $U_i(V)$	800	800	1000	1000	1000	1000
Rated impulse with standard voltage $U_{imp} (KV)$	8	8	8	8	8	8
Utilisation category	A	A	A	A	A	A
Rated limited short-circuit capacity $I_{cu}(KA)$	220/230V	25	50	70	70	80
	380/415V	16	36	36	36	50
	400V	10	25	30	30	36
	500V	8	20	25	25	35
	690V	3	5	20	20	30
	500V-3poles in series	16	36	36	36	50
Rated short -circuit service breaking capacity $I_{cs}(\%ICU)$	100	75	100	100	100	100

#### Remark:

1. In 15A=10KA@277VAC-10KA@347VAC
2. In 15A=35KA@240VAC-14KA@480Y/277VAC
3. T5 600 with electronic trip units only and in three pole version
4. 2p T5 400 available only in N interrupting rating
5. I In from 15A up to 30A=65KA@480VAC
6. 100 3p, T4V 250 3p, T5H 400 3p, T5V 400 3p are defined "current limiting".

### 3. Trip Units Main Technical Parameter

#### ● Thermal Magnetic Trip Units

n [A]	25	35	40	50	60	80	100	125	150	175	200	225	250	300	400	600	800
Neutral [A]	25	35	40	50	60	80	100	125	150	175	200	225	250	300	400	600	800
<b>T1 (I1=In)</b>																	
<b>T3 (I1=In)</b>																	
T5 400 (I=0.7...1xIn) <span style="float: right;">■ ■</span>																	
T6 (I=0.7...1xIn) <span style="float: right;">■ ■</span>																	
<b>T1</b>																	
UA]	1000		1000	1500	1500	1500	1500										
Neutral [A]	1000		1000	1500	1500	1500	1500										
<b>T2,T3</b>																	
UA]	500	500	500	500	600	800	1000	1250	1500	1750	2000	2250					
Neutral [A]	500	500	500	500	600	800	1000	1250	1500	1750	2000	2250					
<b>T5</b>																	
UA]			500	500		400 800	500 1000	625 1250	750 1500		1000 2000		1250 2500	1500 3000	2000 4000	3000 6000	4000 8000
Neutral [A]			500	500		400 800	500 1000	625 1250	750 1500		1000 2000		1250 2500	1500 3000	2000 4000	3000 6000	4000 8000
<b>T6</b>																	
$I^3 = 5 \cdot 10 \times I_n [A]$																3000 6000	4000 8000
Neutral [A] - 100%																3000 6000	4000 8000
Neutral [A] - 50%																1500 3000	2000 4000

#### ● Basic Protection Functions



##### (L) Protection against overload

This protection function trips when there is an overload with inverse long-time delay trip according to an inverse time curve ( $I^2t=k$ ). The protection cannot be excluded.



##### (S) Protection against short-circuit with time delay

This protection function trips when there is a short-circuit, with long inverse time-delay trip ( $I^2t=k$  ON) or a constant trip time ( $I^2t=k$  OFF). The protection can be excluded.



##### (I) Instantaneous protection against short-circuit

This protection function trips instantaneously in case of a short-circuit. The protection can be excluded.



##### (G) Protection against ground fault

The protection against ground fault trips when the vectorial sum of the currents passing through the current sensors exceeds the set threshold value, with long inverse time-delay trip ( $I^2t=k$  ON) or a constant trip time ( $I^2t=k$  OFF). The protection can be excluded.

• Electronic Trip Units

PR221DS-LS/I

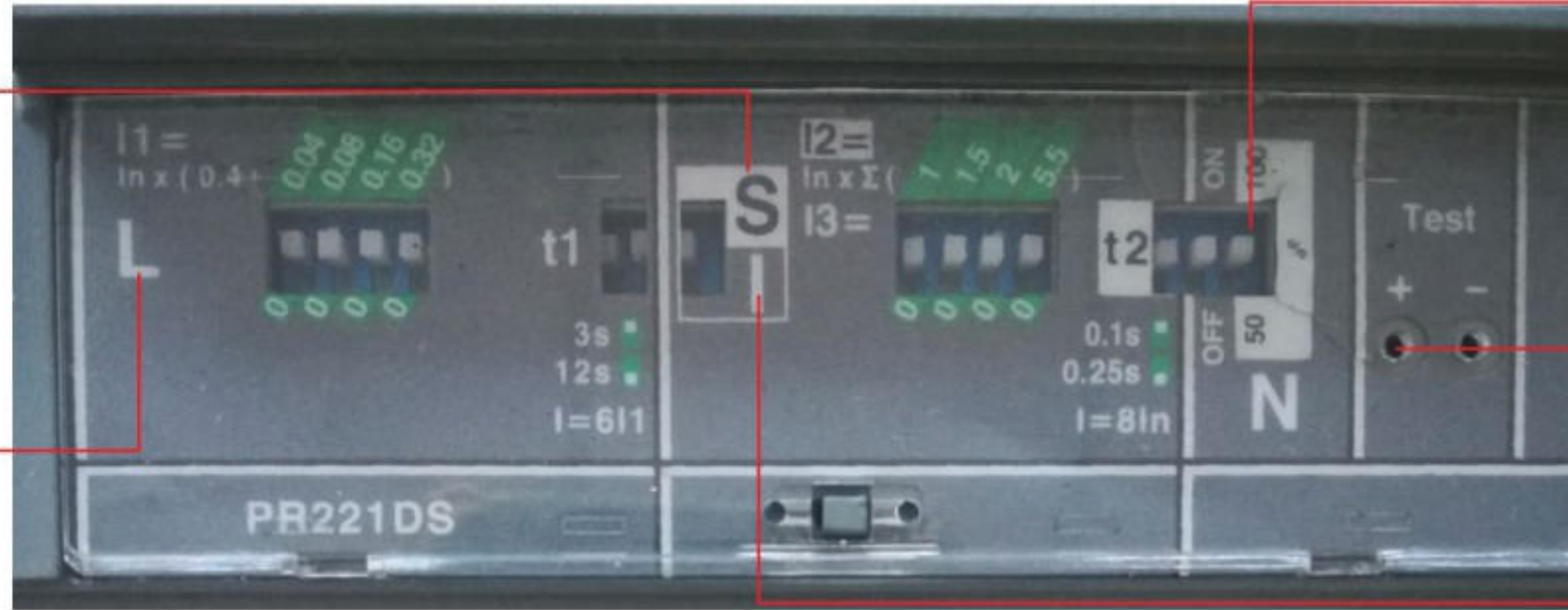
**Protection S**  
Against short-circuit with delayed trip

**Protection L**  
Against overload

Dip-switch for neutral setting (only for T5 and T6)

Socket for TT1 test unit

**Protection I**  
Against short-circuit with instantaneous trip



PR221DS - Protection functions and settings

Protection functions	Trip threshold	Trip curves <sup>(1)</sup>
<p><b>L</b> CANNOT BE EXCLUDED</p> <p>Against overload with long inverse time delay trip and trip characteristic according to an in-verse time curve (<math>I_2t = \text{constant}</math>)</p>	<p><math>I_1 = 0.40 - 0.44 - 0.48 - 0.52 - 0.56 - 0.60 - 0.64 - 0.68 - 0.72 - 0.76 - 0.80 - 0.84 - 0.88 - 0.92 - 0.96 - 1 \times I_n</math></p> <p>Release between <math>1.1 \dots 1.3 \times I_1</math> (IEC 60947-2 and UL 489)</p>	<p>at <math>6 \times I_1</math> <math>t_1 = 3s</math></p> <p>at <math>6 \times I_1</math> <math>t_1 = 6s</math> <b>only for T2</b></p> <p>at <math>6 \times I_1</math> <math>t_1 = 12s</math> <b>only for T5</b></p> <p>Tolerance: <math>\pm 10\%</math> up to <math>6 \times I_n</math> <math>\pm 20\%</math> above <math>6 \times I_n</math></p>
<p><b>S</b> CAN BE EXCLUDED</p> <p>Against short-circuit with inverse short time delay trip and trip characteristic with inverse time (<math>I_2t = \text{constant}</math>) (selectable as an alternative to protection function I)</p>	<p><math>I_2 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n(2)</math></p> <p>Tolerance: <math>\pm 10\%</math> (T5) <math>\pm 10\%</math> up to <math>2 \times I_n</math> (T2)</p>	<p>at <math>8 \times I_n</math> <math>t_2 = 0,1s</math></p> <p>at <math>8 \times I_n</math> <math>t_2 = 0,25s</math></p> <p>Tolerance: <math>\pm 10\%</math> up to <math>6 \times I_n</math> (T5) <math>\pm 20\%</math> above <math>6 \times I_n</math> (T5) <math>\pm 20\%</math> (T2)</p>
<p><b>I</b> CAN BE EXCLUDED</p> <p>Against short-circuit with in-stantaneous trip (selectable as an alternative to protection function S)</p>	<p><math>I_3 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n(3)</math></p> <p>Tolerance: <math>\pm 10\%</math> (T5) <math>\pm 20\%</math> (T2)</p>	<p>instantaneous</p>

<sup>(1)</sup> These tolerances hold in the following conditions:

- self-powered relay at full power and/or auxiliary supply;
- two or three-phase power supply.

In conditions other than those considered, the following tolerances hold:

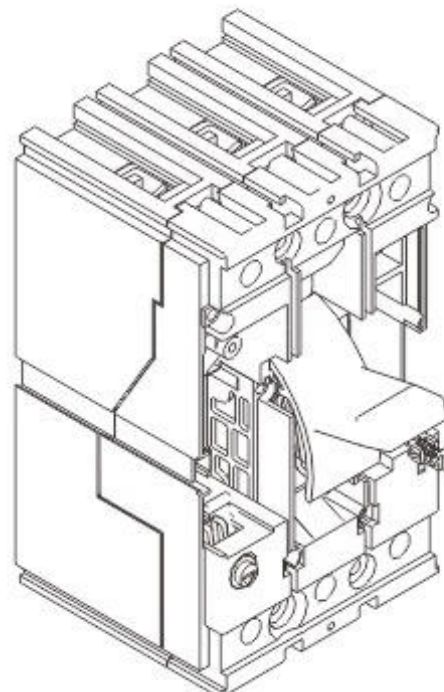
	Trip time
<b>S</b>	$\pm 20\%$
<b>I</b>	$< 40ms$

<sup>(2)</sup> For T5  $I_n = 600 A \Rightarrow I_2 \text{ max} = 9.5 \times I_n$   
<sup>(3)</sup> For T5  $I_n = 600 A \Rightarrow I_3 \text{ max} = 9.5 \times I_n$

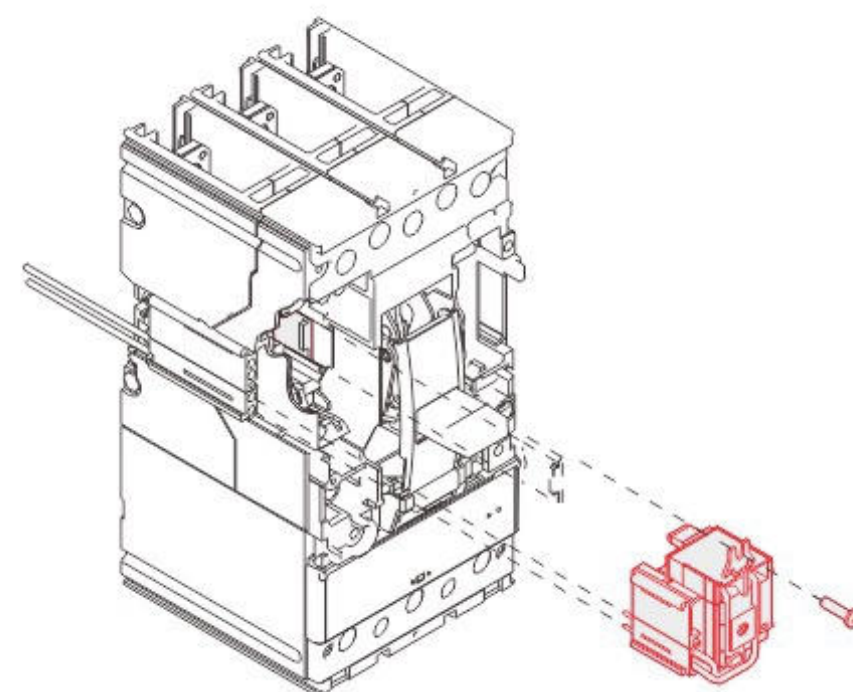
4. Accessories Service Releases

• Shunt Trip-SOR

Allows circuit breaker opening by means of an electric command. Operation of the trip is provided for a voltage between 70% and 110% of the rated power supply voltage  $U_n$ , both in alternating current and in direct current. For LKM3 T1, T3, T5 and T6, the SOR shunt trip is fitted with a limit contact for cutting off the power supply in the open position and with the release tripped.



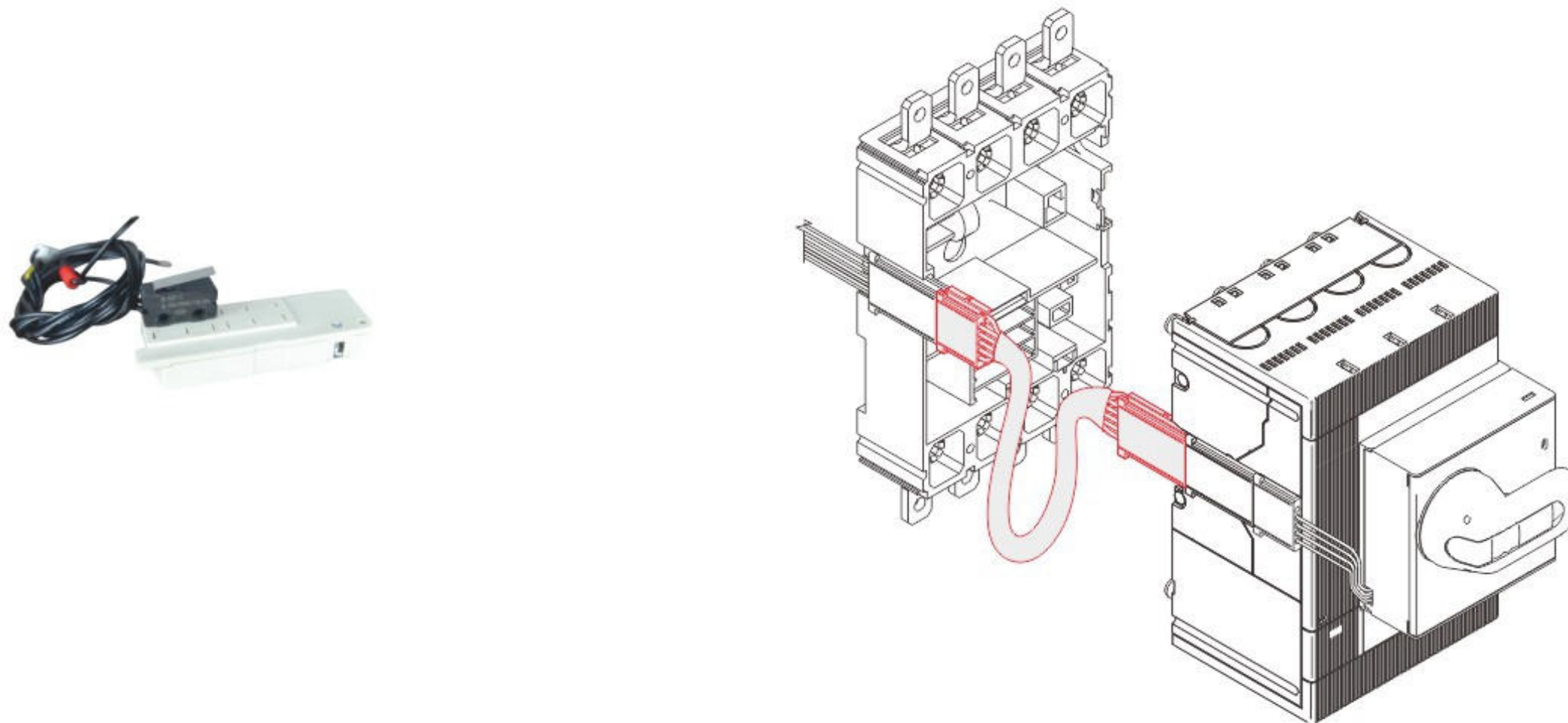
T1, T3



T5-T6

### ● Testing extension for service releases

Available for LKM3-T5 and T6, this allows the service releases to be supplied with the circuit breaker in the removed position. With the circuit breaker in safe conditions, i.e. isolated from the power circuits, this makes it possible to carry out blank tests of the circuit breaker functionality.

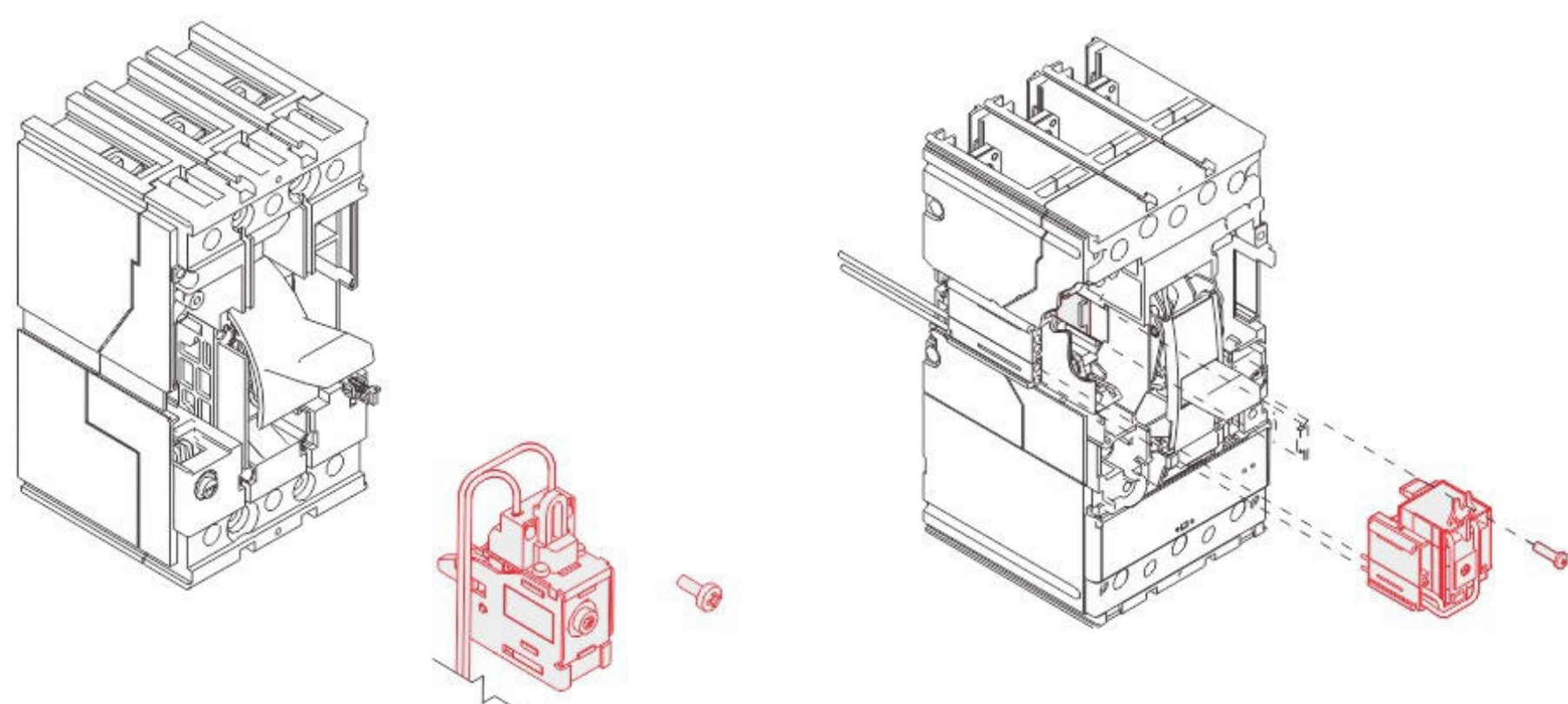


### ● Undervoltage release-UVR

The undervoltage release opens the circuit breaker due to lack of release power supply voltage or due to values under  $0.7 \times U_n$  with a trip range from  $0.7$  to  $0.35 \times U_n$ . After tripping, the circuit breaker can be closed again with a voltage higher than  $0.85 \times U_n$ . With the undervoltage release de-energised, it is not possible to close the circuit breaker or the main contacts.)



### ● UVR-Electrical characteristics

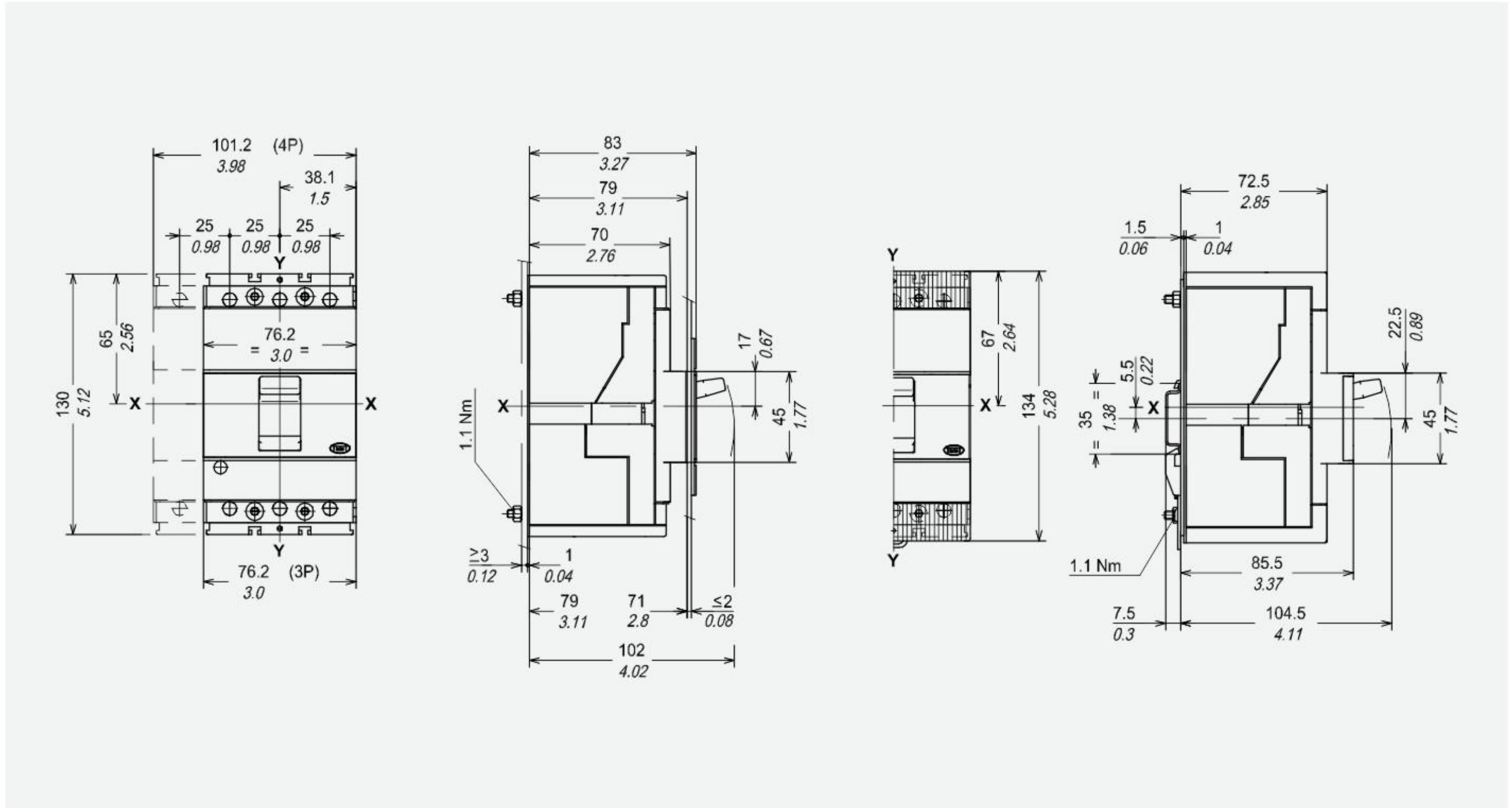


T1, T3

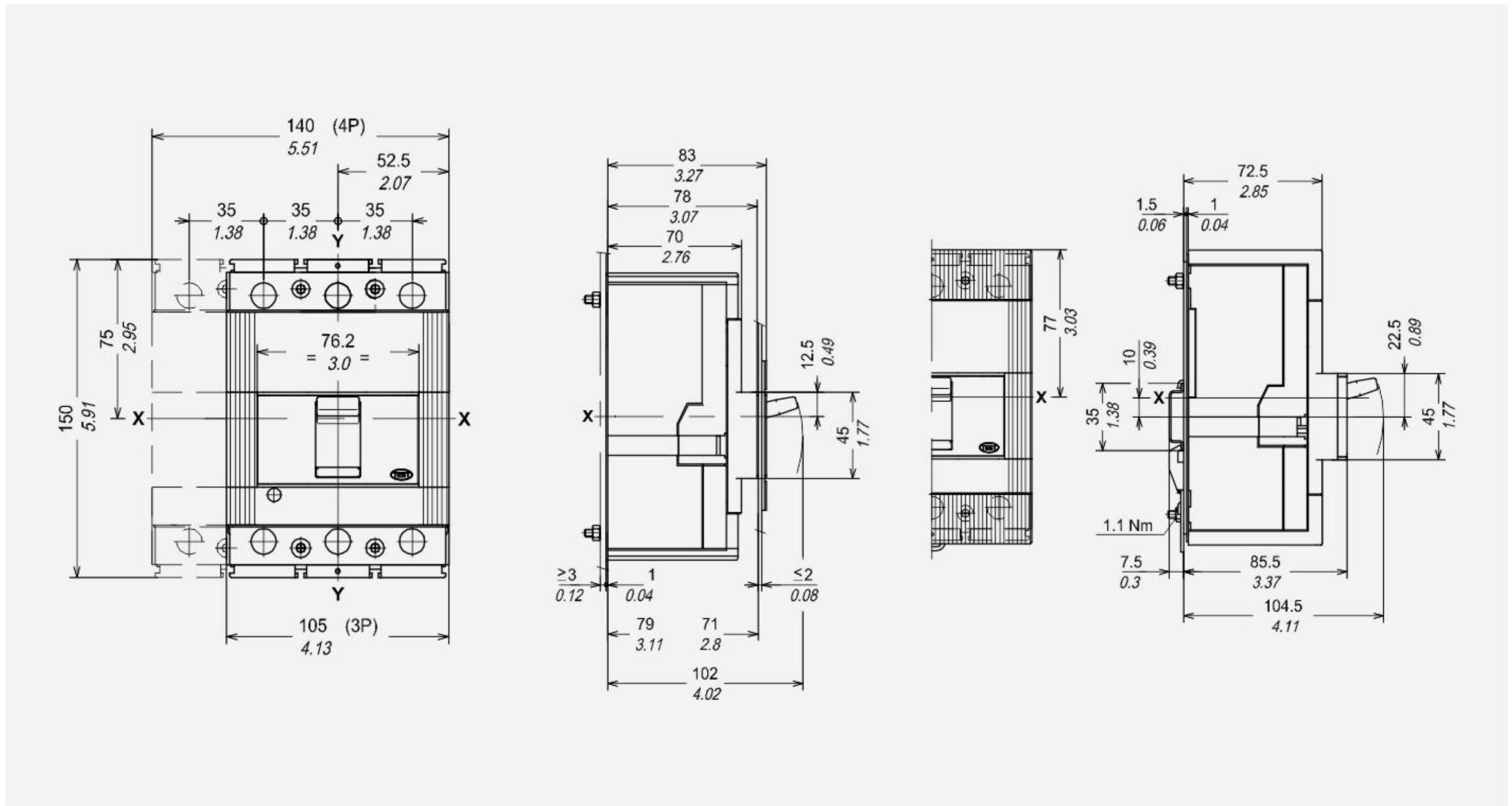
T5-T6

5. Outline And Installation Dimensions

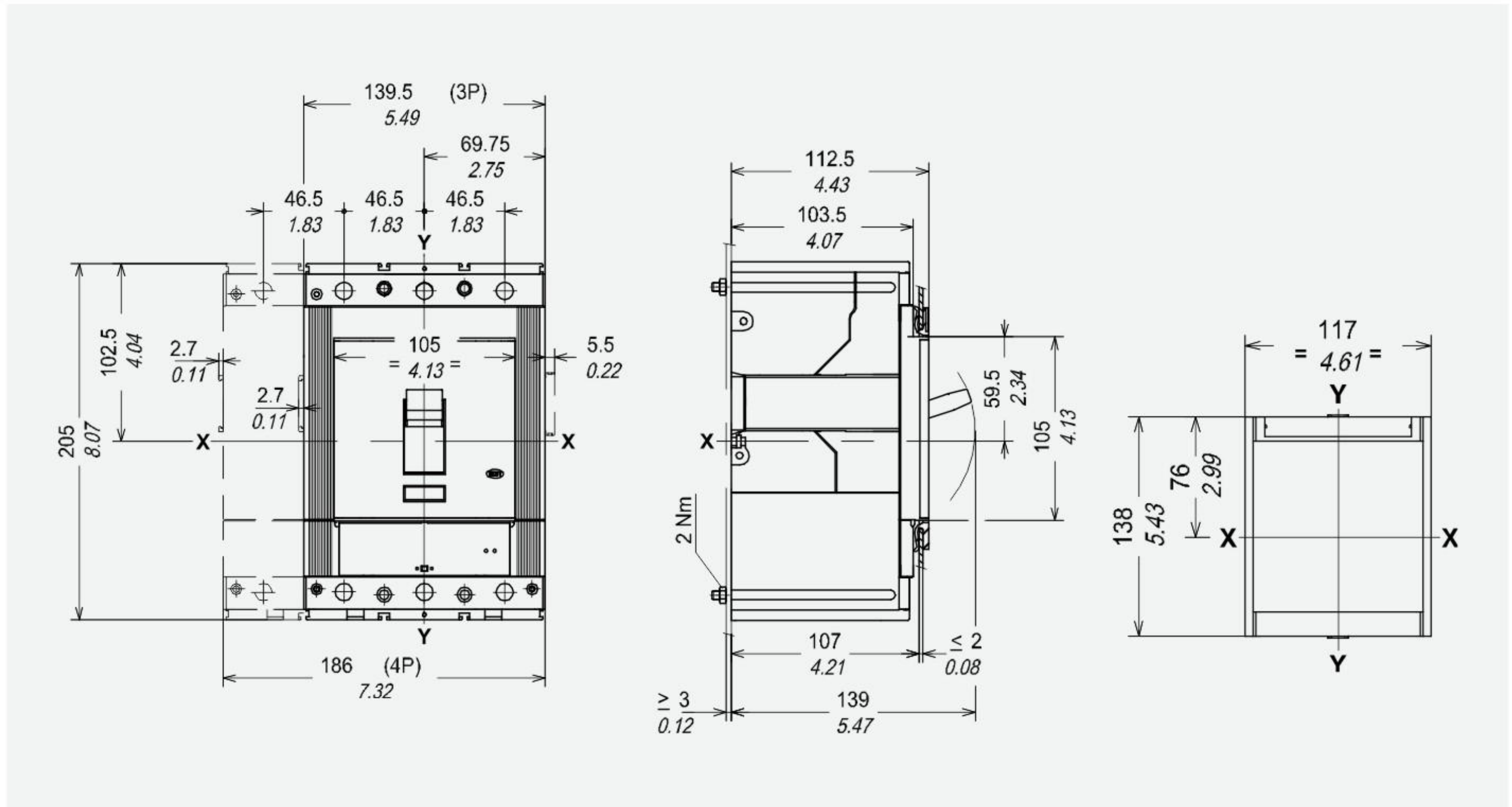
• T1 Profile Dimension Diagram



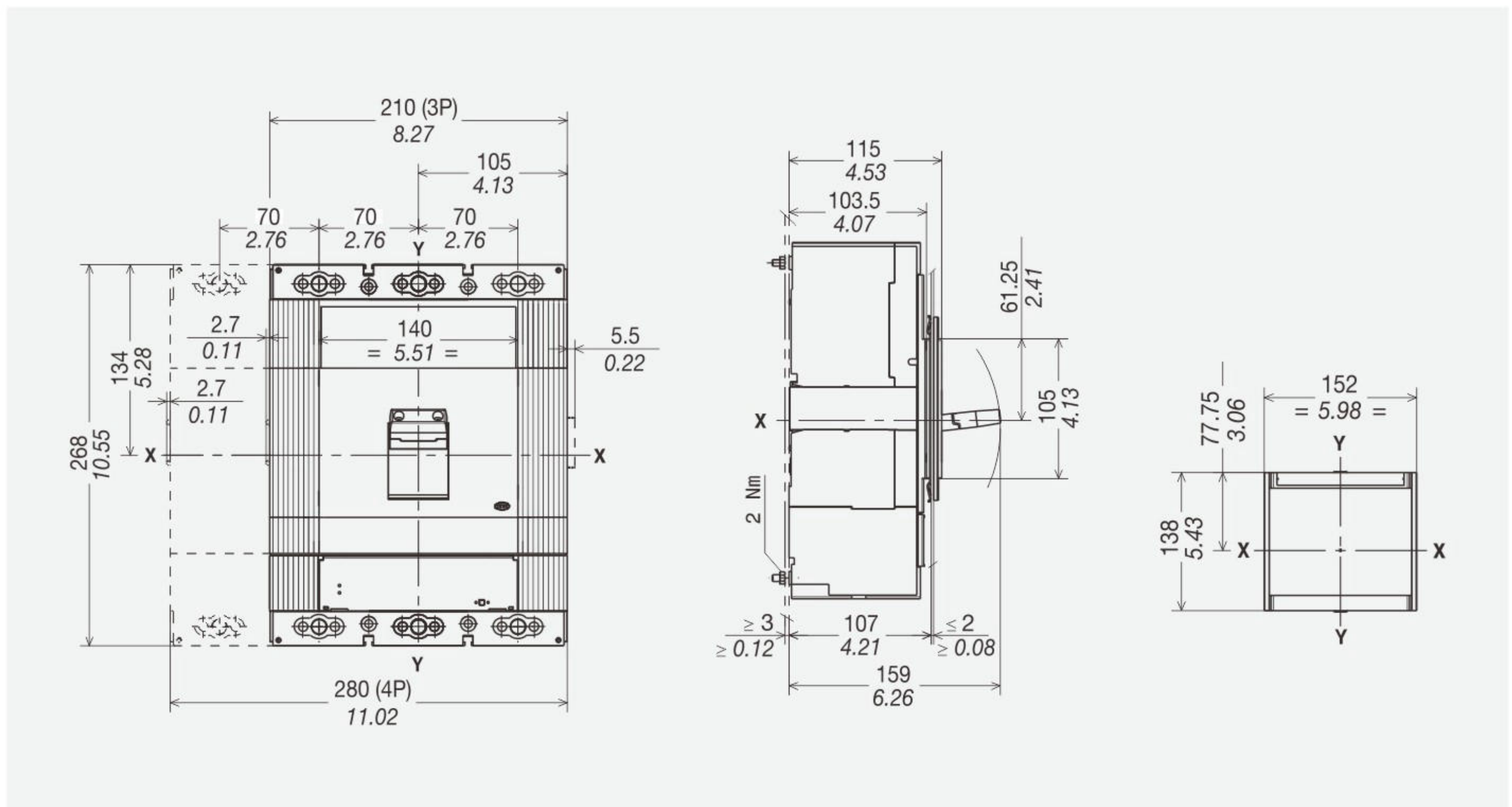
• T3 Profile Dimension Diagram



### • T5 Profile Dimension Diagram



### • T6 Profile Dimension Diagram



• T7 Profile Dimension Diagram

